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Walla Walla Basin Watershed Council
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May 3, 2010

OWEB Project # 206-363 Final Report

Project Description: Hudson Bay Aquifer-Spring Restoration Phase II and III

Dear Oregon Watershed Enhancement Board and Staff,

The Walla Walla Basin Watershed Council appreciates the support of the Oregon watershed enhancement Board through the years in helping the WWBWC and our local irrigators implement irrigation efficiency, fish passage projects, fish habitat projects, and shallow aquifer recharge to recover depleted groundwater.

The Walla Walla River no longer goes dry every summer. Aggressive irrigation efficiency has rewatered the river in the summer and farms remain viable. Our ESA listed Bull Trout and Steelhead population numbers continue to rise, and our partners, the Confederated Tribes of the Umatilla Indian Reservation have successfully reintroduced Chinook salmon back into the river. Increased river flow has improved fish passage and has increased the number of miles of available fish habitat.

Our improvements to flow have come at the expense of our aquifer. Groundwater levels have been in decline similar to our neighbors to the south, the Umatilla Watershed. Piping irrigation water delivery ditches has allowed the "saved" water to remain in river for fish, but has also resulted in an increasing decline of our groundwater. The second most commonly used tool for farms to leave part of their water rights instream for fish has been using existing wells for longer periods each year and drilling additional wells, also leading to dropping groundwater levels. Many spring fed creeks and shallow wells have dried up, demonstrating the decline of groundwater.

More flow is still needed for our fish in the summer. We need to replicate floodplain function and extend the time water resides in the basin. Putting more of our winter and spring runoff into the ground mimics this function and supplements groundwater base flows to the river during the drier months of the year.

The attached report covers the justification, initial operation, and hydrologic benefits observed from the Hudson Bay District Improvement Company Shallow Aquifer Recharge project. This truly innovative project has been essential in demonstrating that shallow aquifer recharge can show measurable improvements to groundwater tables as evidenced by improvements to the flow of spring creeks and water levels in monitoring wells located near and down-gradient from the project site. Not only have the flows in the Walla Walla River improved to enable passage and expanded habitat for Federally protected

Steelhead and Bull trout, and reintroduced Chinook Salmon, but the spring creeks across the valley floor that historically hosted steelhead and contain lingering populations of red band trout now have a proven mechanism, shallow aquifer recharge, that can utilize the availability of high winter and spring river flows to saturate the floodplain and hold that water longer for the benefit of multiple uses.

The WWBWC aquifer recharge program in the Walla Walla has put as much as 5772 acre feet into the ground each winter the last 5 years. We have been working with Hudson Bay District Improvement Company to bring a portion of the high winter and spring river flow to a series of basins and infiltration galleries located in floodplain gravels. We have recovered two spring creeks that are tributaries of a Steelhead stream. The state of Washington has seen our accomplishments and has funded the WWBWC to set up multiple aquifer recharge sites in the Washington portion of the watershed. OWEB has helped us implement aquifer recharge and document the results on the Oregon portion and we will continue to do so with our new OWEB grant # 210-6043.

There were very few changes from the original OWEB proposal. The WWBWC was able to secure much of the necessary match funding from BPA. The existing aquifer recharge site was expanded with the four types of infiltration galleries and their associated monitoring equipment installed, the spreading basins were expanded, monitoring of surface flow improvements and groundwater level improvements were documented as part of the monitoring component, the limited license for water use was renewed, and multiple education and outreach events have occurred.

WWBWC staff have promoted this project with presentations at WWBWC meetings, and Walla Walla County Watershed Planning meetings, irrigation district board meetings, Umatilla County Groundwater Taskforce meetings, site tours for our Umatilla County commissioners, the Washington Governor's office staff and husband, Water Management Conference and local conference attendees, state agency staff, and members of the local community. This project has also been highlighted in presentations at the Network of Oregon Watershed Council Conference 2009, and the Oregon Association of Conservation Districts Conference of 2009. The project has also been described in articles in the Walla Walla Union Bulletin, the East Oregonian, Southwest Hydrology Journal, and the Capital Press.

This project type is not described in the Oregon Aquatic Habitat Restoration and Enhancement Guide. However, this project's proven ability to improve stream flows demonstrates an innovative technique to restore aquatic habitat by restoring groundwater levels that maintain base flows of spring creeks and rivers.

A Financial Report is attached. The following is a list of the report's appendices:

I) Water Quality lab reports on samples of water used for recharge
II) Limited licenses and applications
III) Engineered Designs of infiltration basins, Infiltration galleries, and turnout structures at the site including additional explanation of the construction and operations
IV) Recommendations and next steps

This project would not have been possible without the contributions from Hudson Bay District Improvement Company, OWEB, BPA, NRCS, OWRD, ODEQ, the Walla Walla Watershed Alliance, Bernie Hewes Engineering, Groundwater Solutions, Inc., OSU extension, and the dedication of WWBWC staff.

For further questions contact myself, Brian Wolcott, WWBWC Executive Director, or Rick Henry, Staff Hydrologist, at 541-938-2170.

Sincerely,

Brian Wolcott

Aquifer Recharge as a Water Management Tool: Hudson Bay Recharge Testing Site Report (2004-9)

HBDIC Recharge Project Expansion with Basin #1 (foreground), spring 2008

April 18th, 2010

Prepared by

Bob Bower, Hydrologist, WWBWC
Kevin Lindsey, LHG (WA), GSI

For

Hudson Bay District Improvement Company (HBDIC)

In Support of

OWRD Limited Testing License (Final Order #1059)
ODEQ Water Quality Reporting (Final Order #1059)
OWEB Grant Funding (#206-363)
BPA Grant Funding (#35684)

45 Years Ago…

"Some initial tests at artificially recharging the gravel aquifers by placing excess surface water into gravel pits and onto unused gravelly fields have reportedly helped raise temporarily the water level in wells of their vicinities. A comprehensive plan for the systematic management of the old gravel as a water reservoir is an obvious need that will surely come about ultimately. Such a comprehensive plan and systematic management will need to include all phases of natural and artificial recharge in order to obtain maximum benefits from this important natural water-storage facility."

Geology and Groundwater Resources of the Walla Walla River Basin, Washington-Oregon.

Robert Newcomb, USGS - 1965

"What you have to do and the way you have to do it is incredibly simple. Whether you are willing to do it is another matter." ***(Peter F. Drucker)***

Table of Contents

45 Years Ago… 2

Equations 6

Acknowledgements 6

Executive Summary 8

PART I. BACKGROUND 11

Forward 11

Basin Overview and Development of Managed Aquifer Recharge 14

Historical Trends in Walla Walla Basin Aquifer Hydrology and Hydrogeology Leading to Managed Aquifer Recharge 18

What is Managed Aquifer Recharge? 28

Managed Aquifer Recharge – Not a New Idea 32

PART II. THE HBDIC ALLUVIAL AQUIFER RECHARGE PROJECT 33

Testing Managed Aquifer Recharge: HBDIC Site Operations and Monitoring (2004-9) 33

Site Specific Hydrogeology and Geology 37

The HBDIC Alluvial Aquifer Recharge Site 39

Overview 39
Spreading Basins Operations 41
Spreading Basins Recharge Results 44
Deciphering the Variations in Recharge Volumes and Rates 48
Seasonal Temperature Fluctuations 48
Water Table Mounding and/or Basin Clogging 49

HBDIC Water Quality Monitoring Program and Procedures (2004-2009) 53

2004-2009 HBDIC Recharge Water Quality Results 55
Indicators of Soil-aquifer Treatment (SAT) at the HBDIC Recharge Site 57

Aquifer Response to Recharge 59

Site-Specific Groundwater Response 60

System Wide Groundwater Response to Spreading Basin Operations 65

Spring-Creek Responses 72

Linking Spring Responses to Declines in Groundwater Storage 80

Other Recharge Results: Johnson Creek Recovery 81

Summary of Spreading Basins Testing and Recommendations 82

PART III. INFILTRATION GALLERIES 83

Infiltration Gallery Testing 83

Overview 83
Infiltration Gallery Designs, Permitting and Testing 84
Infiltration Gallery Testing Plan 88
Infiltration Gallery Testing Results – Preliminary 90
Cost-Effectiveness Summary 92
Summary of Infiltration Gallery Testing and Recommendations 93

PART IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 94
Summary of Results 94
Managed Aquifer Recharge – Balancing Storage 95
Moving Forward: From Testing to Programmatic Response 96
Bibliography 100

Appendices

Appendix I Laboratory Results

Appendix II Limited Licenses

Appendix III Infiltration Basin and Gallery Design Plans

Appendix IV Photographs

Table of Figures

Figure 1. State of Oregon Beneficial Waters Uses for the Walla Walla Basin. 11
Figure 2. Mechanisms that influence balance of shallow aquifer storage (WWBWC, 2007) 13
Figure 3. Historical changes propagating the status of shallow aquifer storage balance (ΔS_G) 14
Figure 4 Map of the Walla Walla Basin Watershed (Baker T. , 2010) 15
Figure 5. 1858 Mullen Map of Distributary Walla Walla and Little Walla Walla River System (Mullan, 1863) 16
Figure 6. Bi-state Walla Walla and Little Walla Walla River System Area including Aquifer Recharge Testing (WWBWC) 17
Figure 7. Site Map for Oregon Water Resources' State Observation Wells (1933 to present) 19
Figure 8. Depicting drop in aquifer at observation well next to Walla Walla River. 20
Figure 9. Oregon State Observation Well (SOW 853 – WWBWC #GW-17) showing historic declines of shallow aquifer water table 21
Figure 10. Map of Walla Walla River system spring-creeks (Oregon only), showing the basic distribution of the inner zone. 22
Figure 11. Historic versus Current Flow monitoring on McEvoy Spring Branch, tributary to the Walla Walla River 23
Figure 12. Comparison of the Walla Walla River meanders from 1939 to 2006 (ODEQ, 2006) 25
Figure 13. (A, B, C, and D) Historical Progression of Groundwater Development - Oregon: 1903-2005 (WRIS Data, 2006) 28
Figure 14. Anaheim Lake, one of OCWD's recharge basins (Courtesy of OCWD website) 30
Figure 15. Map of OCWD's "Groundwater Replenishment System" (Courtesy OWCD website) 30
Figure 16. August, 2006, WWBWC staff toured the Aqua Fria Recharge Project outside Phoenix Arizona (Courtesy C.A.P. website) 31
Figure 17. Walla Walla River valley shallow aquifer system. 35
Figure 18 Sediment Stratigraphic Chart of the Walla Walla shallow aquifer units (GSI INC et. al., 2007) 36
Figure 19. Major sedimentary layer of the Walla Walla River Valley Shallow Aquifer. (GSI, 2007) 36
Figure 20. Top of Columbia River basalt, or bedrock boundary for shallow aquifer (GSI, 2007) 37
Figure 21. Geologic Transect of White Ditch at HBDIC Recharge Site (Baker T. , 2010) 39

Figure 22. Original HBDIC Site Designs 2003 – Engineering by Bernie Hewes, PE Oregon *40*
Figure 23. Map of HBDIC Recharge site and Source Water Delivery System *42*
Figure 24. Comparison Walla Walla River source water to Diversions and Use (WY 2009). *43*
Figure 25. Aerial Map of HBDIC Recharge Site with Monitoring *44*
Figure 26. 2004-9 HBDIC Recharge Flows (daily average – cfs) *45*
Figure 27. Comparison of fall vs. Winter Effective Recharge Rates for Temperature *49*
Figure 28. HBDIC Effective Recharge rates (cfs) – 2004-9 ..... *50*
Figure 29. HBDIC Recharge Rates in Acre-feet/day *51*
Figure 30. Conceptual Diagram of Aquifer Recharge Mounding and Saturated Groundwater Movement *52*
Figure 31. HBDIC On-site Observation Well Water Level Data (2004-9) *53*
Figure 32. Surface versus Groundwater Fecal Coliform Results (2004-9) *58*
Figure 33. Comparison of Source vs. Groundwater fecal coliform statistics (2004-9) *59*
Figure 34. On-site Surface to Groundwater Response to Recharge Operations (2009) *61*
Figure 35. HBDIC Site Monitoring Wells and Various Sources of Recharge *62*
Figure 36. Comparison of White ditch and HBDIC recharge site operations to Groundwater Response *63*
Figure 37. HBDIC Site Observation wells Irrigation Season water levels (2004-9) *64*
Figure 38. Water Table Response to HBDIC Recharge Operations: May 1st- May 31st *65*
Figure 39. WDOE Funded Dedicated Observation Well at Pepper Bridge Vineyards Road Grange Hall (Washington) *66*
Figure 40. Map depicting WWBWC's Bi-state Well Monitoring System of the Walla Walla River valley Shallow Aquifer System *66*
Figure 41. WWBWC Monitoring Wells and Transects Relative Recharge System Response *67*
Figure 42. WWBWC Dedicated Monitoring Well used as up gradient Control for HBDIC Recharge Groundwater Response (2001-9) *68*
Figure 43. Water Levels at WWBWC Monitoring Well GW-31 (2002-9) *69*
Figure 44. Water Levels at WWBWC Monitoring Well GW-34 ..... *69*
Figure 45. Groundwater Response to recharge in Johnson and Dugger Spring-Creeks Subbasins (2009) *70*
Figure 46. HBDIC Recharge Site Flow Direction(September 2009) *71*
Figure 47. Groundwater Specific Conductance Map (Baker T., 2010) *72*
Figure 48. 2008 OSU IWFM Modeling Scenario for Johnson Creek (Petrides, 2008) *73*
Figure 49. Transect from HBDIC project site headwaters of Johnson and Dugger Creek Springs *74*
Figure 50. WWBWC Monitoring Wells (Transect B2) from HBDIC Site to near Headwaters of Johnson Creek Springs *75*
Figure 51. Aerial Map of GW-65 and Gauges-Springs on Johnson and Dugger Creeks *76*
Figure 52. South Fork Johnson Springs (Pond) – Before and After HBDIC Operations (Bower) *77*
Figure 53. GW-65 vs LWJS Comparison of Groundwater to Spring Response to HBDIC Recharge Project Operations *78*
Figure 54. Comparison of Historic versus Current Johnson Spring-Creek flows (OWRD/USGS and WWBWC). *79*
Figure 55. Comparison of Recharge Groundwater Response to Dugger creek Flow (WY 2008) *80*
Figure 56. Walla Walla Basin Aquifer Water Table Fluctuations and Historical Trends *81*
Figure 57. Johnson Creek flowing again after 25 years (Umapine, Oregon – Bower) *82*
Figure 58 Infiltration Gallery Testing Area (HBDIC Site) *85*
Figure 59. Infiltration Gallery #3 - Stormtech Chamber Installation (2008) *86*
Figure 60. Infiltration Gallery #4 - Atlantis Raintanks Installation (2008) *87*
Figure 61. Infiltration Gallery monitoring equipment (2009) *89*
Figure 62. Preliminary Results of TSS and Conveyance Attenuation from Source to HBDIC Recharge Site *91*
Figure 63. Piezometer water level results from initial operations of IG-1 gallery (2009) *92*
Figure 64. Walla Walla River Basin springs and groundwater returns to the Walla Walla River. *95*
Figure 65. Balancing Storage with Managed Aquifer Recharge and other methods. *96*
Figure 66. Conceptual Graph depicting goals of ARSR program *98*

Table of Tables

Table 1. HBDIC Minimum Instream Flow Requirements *42*
Table 2. 2004-9 HBDIC Spreading Basins Operations for Surface Flows *46*
Table 3. HBDIC Recharge Site Operational Statistics *47*
Table 4. Summary of Baseline Chemistry Sampling Results (2004-9) *56*
Table 5. 2004-9 Fecal Coliform Bacteria Sampling Statistical Summary of Results *57*
Table 6 Infiltration Gallery Testing Preliminary Results *91*
Table 7 General costs breakdown for Infiltration Galleries *93*

Equations

Equation 1 Watershed Water Balance (budget) Equation (Freeze, 1979) *12*

Acknowledgements

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The WWBWC Board of Council Members
OWEB Board of Directors

Dedicated to the citizens, water users and salmon recovery advocates of the Walla Walla Basin. Without the "can-do" spirit of the people of the Walla Walla River valley, none of this would have been possible.

Executive Summary

The Walla Walla Basin is a bi-state basin in northeastern Oregon and southeastern Washington, through which flows the Walla Walla River. The Walla Walla River, and its tributaries, originate in the Blue Mountains, and generally flow westward to a confluence with the Columbia River near Wallula Gap. The river system itself is a primary passage and rearing habitat for ESA-listed steelhead and bull trout, and a focus of tribal efforts at Chinook salmon and lamprey restoration. In addition, the portion of the Walla Walla River system which lies within the Walla Walla Basin and is the focus of this report overlies an alluvial aquifer system that displays a high degree of hydraulic continuity with the River. In the past 50 to 60 years a large number of wells (large and small) have been drilled into, and extract water from, this alluvial aquifer system.

This report:

1. Describes the basic hydrologic conditions that have developed in the Walla Walla Basin in response to development of basin water resources.
2. Looks more closely at alluvial aquifer system conditions that have developed – including a history of water level decline and the possible impacts these declines have had on streams and springs
3. Describes the results of six seasons of shallow aquifer recharge (SAR) activity at the Hudson Bay site.

The Setting: Alluvial sediments (clay, silt, sand, and gravel) largely derived from the adjacent Blue Mountains fills the Walla Walla Basin to a depth of 800 feet in some places. These strata filled a basin that formed as the basalt bedrock that underlies the region was down-dropped by a series of folds and faults that formed in response to regional tectonic stresses. As this bedrock dropped, sediments washed off the Blue Mountains by the ancestral Walla Walla River and other streams collected in the subsiding basin.

Prior to the advent of widespread diversion of surface water and groundwater for agricultural irrigation, industrial uses (primarily food processing), stock watering, and domestic and municipal water supply the Walla Walla Basin was crossed by a series of streams that drained off the Blue Mountains. Most of these streams flowed year round. In addition, as a result of seasonal snow melt and flooding these streams recharged an aquifer system hosted by the alluvial sediments filling the Basin. One of the manifestations of that recharge was the presence of numerous springs on the valley floor. These springs showed the locations where the aquifer system, once fed by seasonally flooding and recharge, discharged to surface waters providing base-flow for streams. In another sense, the abundant springs and streams demonstrated that the alluvial aquifer system was full, and had achieved an equilibrium that balanced recharge with discharge. With the advent of permanent settlement, irrigated farming, and the development of supporting industry, the hydrology of the basin was changed.

Changing Hydrologic Conditions: In the years following the establishment of the Whitman Mission, Fort Walla Walla, and the towns that now dot the Walla Walla Basin landscape, natural streams tributary to the Walla Walla River, and the Walla Walla River itself, have been straightened and channelized to

facilitate the delivery of irrigation water and reduce the extent of seasonal flooding. Stream channel straightening, coupled with the draining of wetlands and boggy areas has increased cropped acreage, pasture availability, and rural residential home building sites. In recent years, un-lined ditches have been replaced by lined ditches and pipes to reduce water conveyance losses and withdrawals from the Wall Walla River. In addition, the primary irrigation districts active in the Basin have reduced the period of time during which they divert water from the Walla Walla River.

All of these actions resulted in the loss of alluvial aquifer recharge; as the residence time and spreading of surface water in the basin was reduced. These actions also likely facilitated a decline in alluvial aquifer water level as channel straightening led to channel deepening; this in turn led to declines in aquifer base level. With alluvial aquifer water level declines, stream flows were further impacted as base-flow and spring-flow was lost. Coupled with these changes to the surface hydrology has been a parallel increase in the number of wells extracting water from the alluvial aquifer system. The impact of these factors on Walla Walla Basin hydrology includes reduced river flow, a flashy river system, and declines in aquifer levels and corresponding base-flows, coupled with diminished aquifer storage.

Recognizing these trends, the Walla Walla Basin Watershed Council (WWBWC) in partnership with the Hudson Bay District Improvement Company (HBDIC) decided in 2003 and 2004 to build a pilot alluvial aquifer recharge project. The goals of this project are to test the feasibility of SAR, develop operational and monitoring plans that can be used to facilitate future SAR projects. Most importantly, the project aims to recharge the alluvial aquifer to the extent possible given the physical constraints of the recharge site and the surrounding aquifer system. Recharge operations have been conducted at the HBDIC SAR site in the winter and spring of each of the past 6 years, or seasons.

The HBDIC SAR Project: Construction and recharge operations at the Site began in the late winter and spring of 2004. At that time 3 infiltration basins, totaling 0.34 acres in size, were constructed adjacent to the HBDIC's White Ditch. The White Ditch delivers Walla Walla River water to the Site. Site recharge operations began in March 2004 after receiving Oregon Water Resources Department Limited License LL-758. This license permitted SAR at the site under OWRD's aquifer recharge rules, and includes:

1. Groundwater and source water monitoring requirements.
2. Stipulations on Site operation related to flows that can be delivered to the Site and minimum flows required in the Walla Walla River (the source of water for the project) to allow the project to operate.
3. The length of each recharge season, November 1st through the following May 15th.
4. Reporting criteria and requirements.

The license was granted following review and comment by other affected entities, including the Confederated Tribes of the Umatilla Indian Reservation and Oregon Department of Environmental Quality.

During the second season of operation, the 2004-2005 recharge season, the infiltration basins were increased in size, to a total area of 1.1 acres. A fourth basin was added during the 2007-2008 recharge season, increasing the total size of the infiltration basins to 1.4 acres. The original limited license

expired in February 2009. In lieu of an application for a permanent water right to operate the HBDIC SAR project, a second limited license (LL#1059) was granted to the project that extended the operational schedule to the summer of 2013. During the 2008-2009 recharge season, all four infiltration basins plus a series of four infiltration galleries were operated.

Through the course of the six recharge seasons completed to-date, the site was operated for a total of 602 days. During this time, approximately 13,100 acre-feet of water was discharged to the underlying alluvial aquifer system. Recharge volumes ranged from a low of approximately 400 acre-feet during the first recharge season, 36 days in the spring of 2004, to a high of 3200 acre-feet in the 128 day long 2006-2007 recharge season. The HBDIC SAR project is interpreted to have had a beneficial impact on the surrounding area, including restoration of flow from the springs that feed Johnson Creek and increased water levels seen in wells in the vicinity of the Site. The fact that long-term water level declines appear to have been slowed, or even reversed in wells in the area of the project suggest that SAR has the potential to both increase water levels in the alluvial aquifer and replace water lost to pumping (increase storage). Groundwater quality also has been shown to have not been degraded as a result of the project.

Conclusions: Our basic conclusion is that the HBDIC SAR project shows that this type of activity is a viable option for water resource managers in the Walla Walla Basin. SAR recharges the aquifer in areas where natural recharge mechanisms have been lost. As long as good quality water is used, such as is naturally flowing into the Basin via the Walla Walla River, alluvial aquifer degradation is not expected to occur. Selectively locating SAR sites across the Basin has the potential to help water managers replenish depleted groundwater supplies and provide clean, cold base-flow to streams and springs at critical times. Some challenges for future SAR projects will be finding locations that allow water managers to meet such goals and acquiring a source of water to use for SAR.

PART I. BACKGROUND

Forward

Water remains at the center of nearly all the current natural resource restoration efforts in the bi-state Walla Walla Basin. The State of Oregon has designated beneficial uses[1] for water in the Walla Walla Basin's to include fish and aquatic life, wildlife, domestic supply, irrigation, livestock, industrial, boating, recreation and for its aesthetic qualities (**Figure** 1). The water needs have changed over the years and now the pressure has increased to find water to ensure all beneficial uses are supplied and maintained. Like many watersheds across the arid western United States, water managers and watershed planning groups struggle to find solutions to the water supply – demand balance. In the Walla Walla Basin, there has been increasing interest in the capture and storage of surplus wet season (winter/spring) water for use during the times when supply is at a deficit. Currently there are a number of groups working to design tools for aquifer management, including: building small and large scale surface-storage reservoirs, a Columbia River pumping exchange projects, a water banking system for surface and groundwater rights, and as this document details the use of managed aquifer recharge for subsurface-storage.

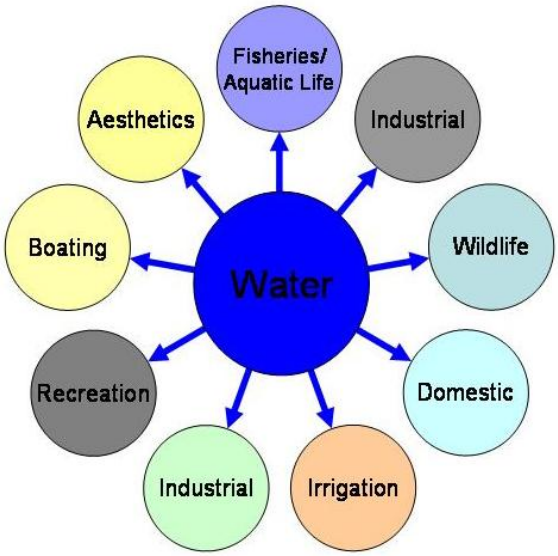


Figure 1. State of Oregon Beneficial Waters Uses for the Walla Walla Basin.

The main purposes of this report are to provide an introduction to managed aquifer recharge (MAR) as a water management tool, the water management needs it targets and provide a report on the design, operation, monitoring and analysis conducted at the basin's largest recharge site, the HBDIC Recharge Site from 2004-9.

[1] OAR 340-04-0330 Table 330A. Online at:
http://www.deq.state.or.us/standards/WQstdsFinalGenBenUseTables.htm

Managed aquifer recharge and the use of natural landforms or features to store water are in concert with the WWBWC' community-based mission:

"*Protect the resources of the Walla Walla Watershed, deal with issues in advance of resource degradation, and enhance the overall health of the watershed, while also protecting, as far as possible, the welfare, customs, and cultures of all citizens residing in the basin." (WWBWC, 2003)*

The community's exploration of MAR demonstrates the emerging appreciation that real solutions to water resource challenges of the future are non-simplistic (e.g. pipe water here, save it there) and cannot be solved by trying to isolate interconnected parts into unilateral solutions. As water continues to be an issue of varying political views it is important to clearly state the perspective from which this report is written with assumptions being:

1. The Little Walla Walla River system was historically and is currently an important part of the management of the basin's surface and subsurface water resources; particularly as they relate to flow in the Walla Walla River mainstem.
2. The historic springs that rely on the shallow aquifer are worthy of protection and restoration, and they serve critical physical and biological roles in the health of the watershed system.
3. Solutions to our water management issues will only be achievable if surface and groundwater is managed conjunctively into the future.

To define the occurrence of water in the shallow aquifer, it is easiest first to discuss the aquifer as it relates to the watersheds overall water balance. For all practical purposes we can treat the water balance of the Walla Walla watershed as a closed system, meaning there are no significant external inflows or outflows of groundwater. However it should be clarified for the purposes of this discussion that an aquifer's storage is always changing due to time related events ranging in minutes to years. Storage can change due to rainfall, spring river freshets, irrigation season well pumping and a long list of other hydrologic events. But when you view this system on a longer timeline for the purpose of managing the resource for future use, this is when trends in storage can be effectively assessed. The general water balance is:

$$P = Q + E + \Delta S_S + \Delta S_G$$

Equation 1 Watershed Water Balance (budget) Equation (Freeze, 1979)

Where **P** represents all the precipitation that falls on the watershed, **Q** (discharge) represents all the flow that leaves the watershed via the surface, ***E*** as the total evapotranspiration, or the sum of all evaporation and plant transpiration, ΔS_S as the change in storage of the surface-water reservoir and ΔS_G representing the change in storage of the groundwater reservoir. The value for ΔS_G or change in groundwater storage is dictated by the balance between what is recharged to how much is discharged from the confined and unconfined aquifers of the basin. For the purposes of this discussion, we focus on only the changes that influence the balance of groundwater storage in the shallow aquifer system.

Conceptually the shallow aquifer ΔS_G can be seen as dependent on the net balance between inputs (recharge) and outputs (discharge). The physical mechanisms that induce infiltration or recharge to groundwater storage (S_G) come in a variety of forms including precipitation, channel bed losses from streams, rivers and ditches, and the application of irrigation water such as flood, rill or sprinklers. Mechanisms by which groundwater storage (S_G) is lost or discharged include well pumping, groundwater seepage directly to channel beds and springs and seeps, and the evapotranspiration of water though agricultural vegetation with roots that extract water directly from the aquifer's water table (**Figure** 2).

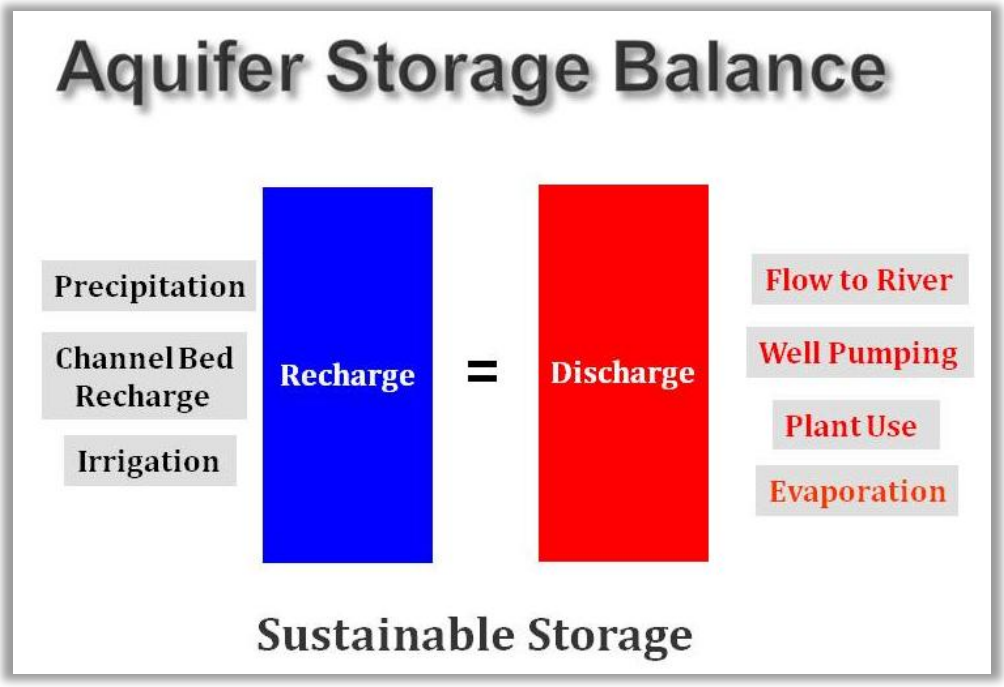
4. 

Figure 2. Mechanisms that influence balance of shallow aquifer storage (WWBWC, 2007)

We define an aquifer' storage as balanced or *sustainable* when the net quantity and timing[2] of recharged water is equal relative to net quantity and timing of discharge water (**Figure** 3). A system is out of balance when storage is either increasing or decreasing.

[2] For the purposes of this introductory to recharge, a steady-state water balance was assumed.

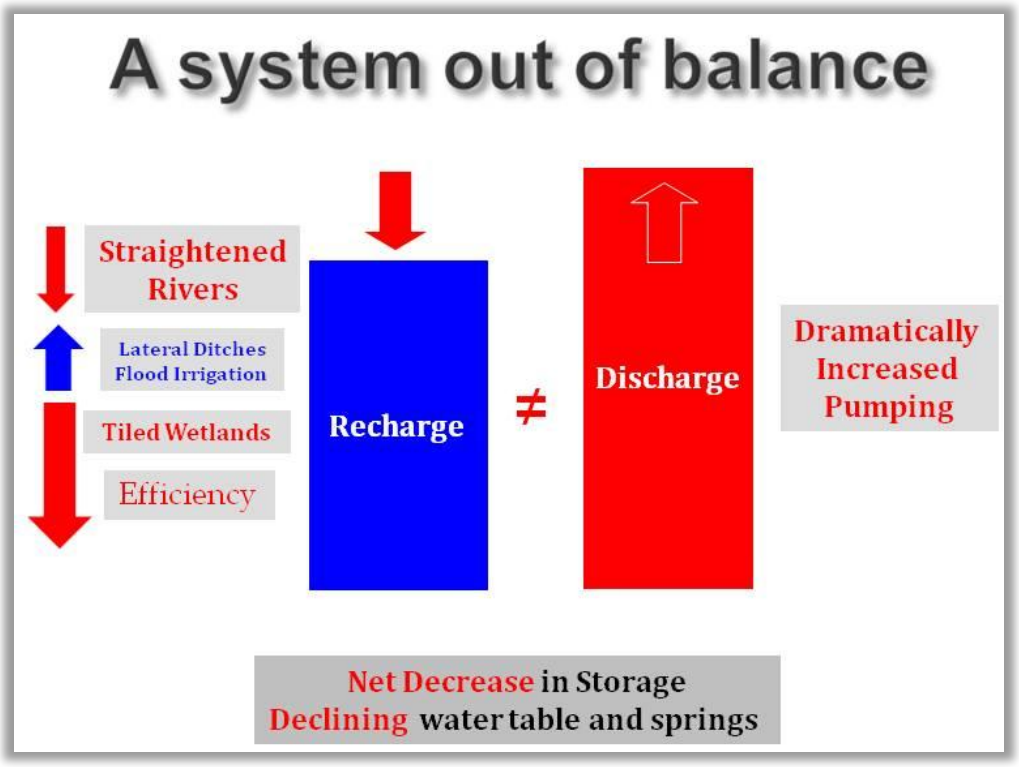


Figure 3. Historical changes propagating the status of shallow aquifer storage balance (ΔS_G)

Basin Overview and Development of Managed Aquifer Recharge

The Walla Walla basin is located in Northeastern Oregon and Southeastern Washington (**Figure** 4). This bi-state system's primary water supply comes from the Walla Walla River which originates in the Blue Mountains of Oregon and flows down through Washington to the Columbia River near Wallula Gap. This river system is the Walla Walla watershed's primary passage and rearing corridor for ESA-listed steelhead and bull trout, and species of tribal cultural significance including chinook salmon and lamprey. In addition, it also serves as the main recharge source for the underlying shallow aquifer system. The Walla Walla River also has had two EPA required Total Maximum Daily Load (TMDL) assessments for nonpoint source pollution which were completed in Oregon (ODEQ-WWBWC) for temperature and in Washington (WDOE) for soluble organic compounds, temperature and sediment.

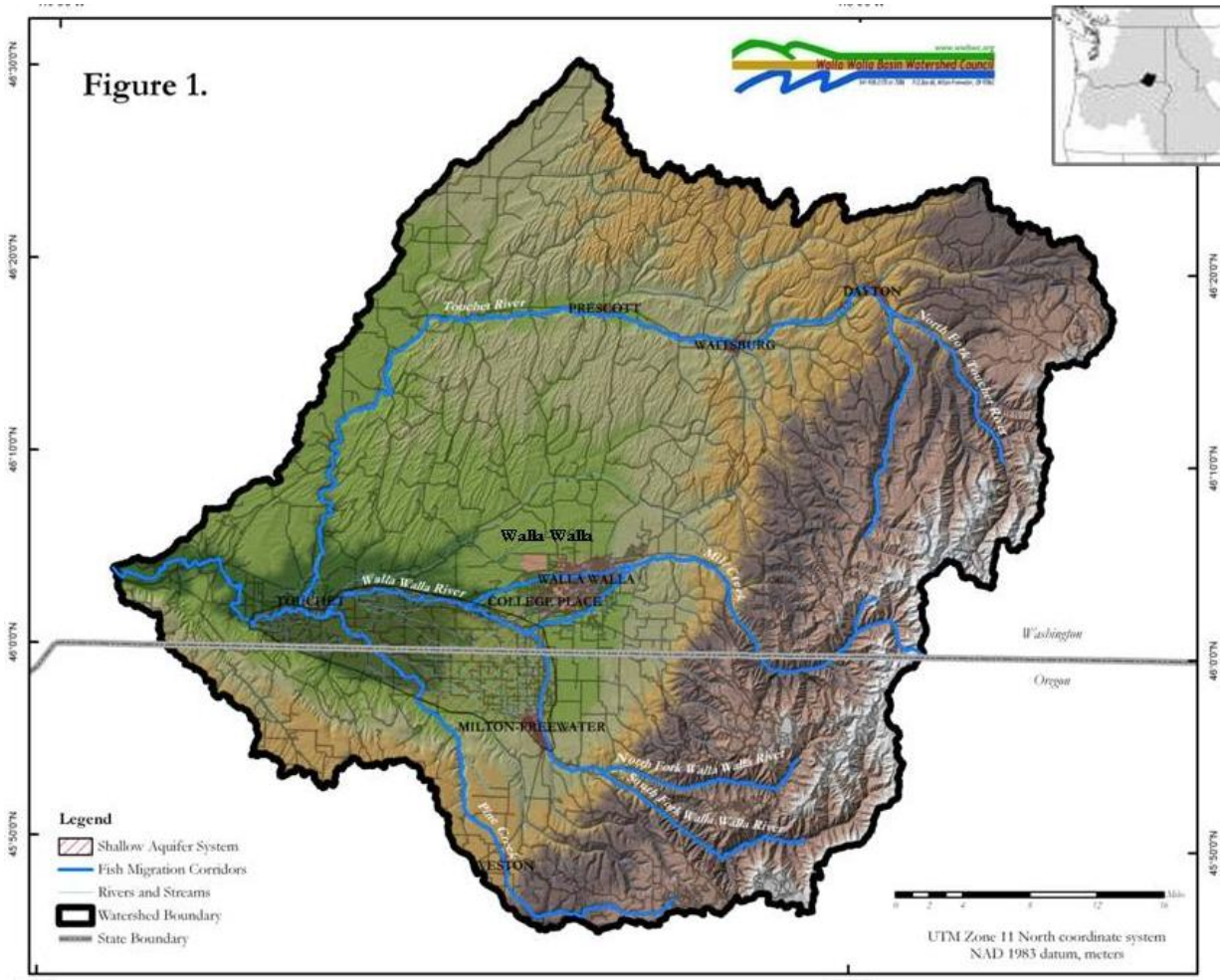


Figure 4 Map of the Walla Walla Basin Watershed (Baker T. , 2010)

The area this report focuses on is the Walla Walla River Valley subbasin.[3] In this subbasin the Walla Walla River historically exited the highlands bordering the basin, at which point it branched into a system of distributary channels that flowed out across the valley floor. These channels then recombined into a single main channel in the central portion of the valley (**Figure** 5). Within this branched distributary stream system groundwater fed spring-creeks were common. With agricultural development, many of these distributary branches were converted to and connected by, irrigation water delivery ditches and connecting lateral ditches.

Newcomb (1965), and even before him Piper (1933) provided a very compelling argument that showed the distributary and spring system was created and maintained over the top of an unconfined alluvial aquifer system. This aquifer supplies the baseflow for more than 50 valley spring-creeks in Oregon and Washington that historically provided year-round baseflow in the form of cool groundwater and off-channel habitat to the mainstem (**Figure** 6). The 240 square-mile

[3] 2006-2010 Development of a Surface-groundwater model to use as a flow restoration and aquifer replenishment planning and management tool.

aquifer also provides direct groundwater contributions in channel to the mainstem Walla Walla River which is particularly important during the summer irrigation and fisheries rearing and passage season. With historically braided and meandering channels and native beaver populations helping to pond and slow water down, the Walla Walla or as the Cayuse Tribe named this subbasin the "*land of many small waters*" historically supported a thriving salmon fisheries and miles of distributary habitat.

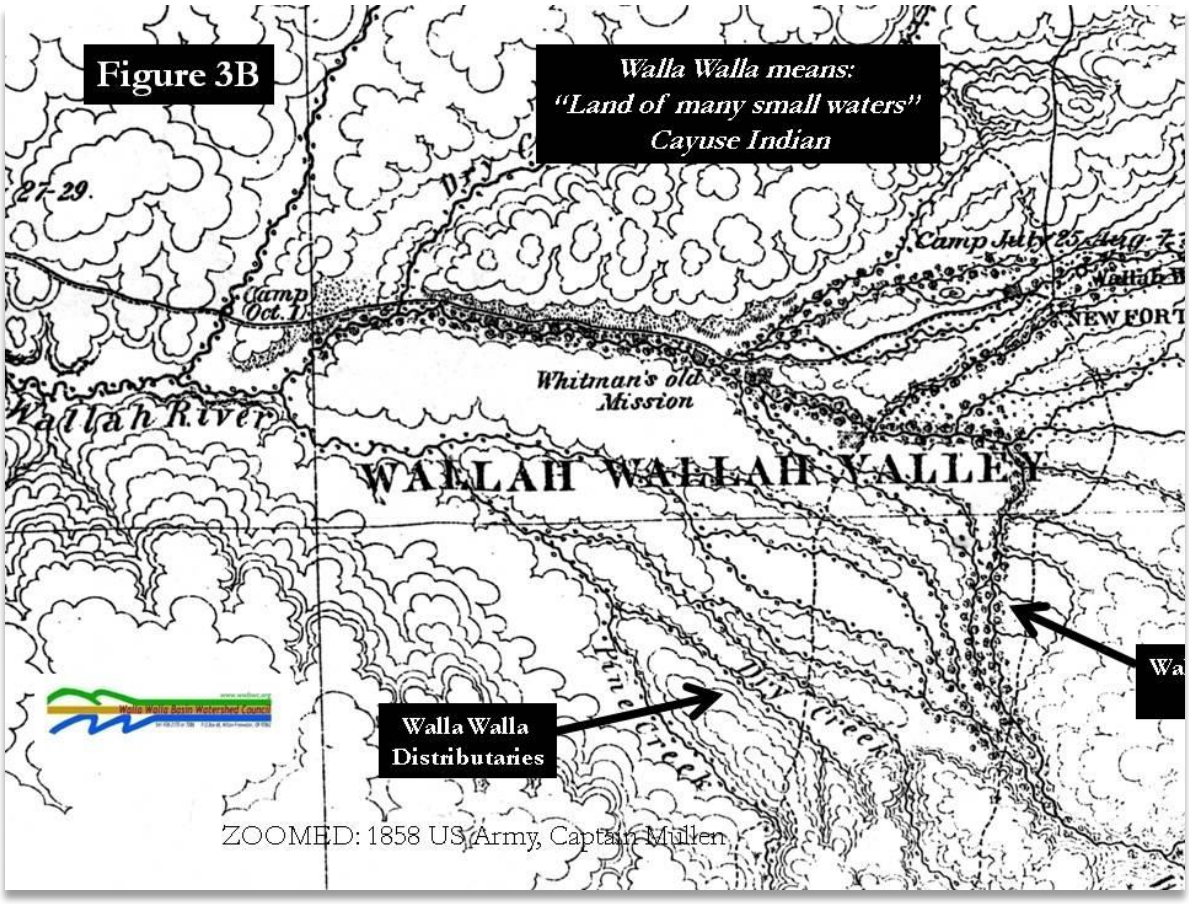


Figure 5. 1858 Mullen Map of Distributary Walla Walla and Little Walla Walla River System (Mullan, 1863)

With the onset of irrigated agriculture, the way in which water was redistributed and used began to change the hydrologic balance of this system. Naturally meandering rivers and creeks were straightened for flood control and irrigation water delivery, acting indirectly to speed up the flow of water through the system. This was offset to a degree by the valley's early flood and rill irrigation practices and the development of the lateral ditch system that acted to effectively 'slow' surface

run-off. By redirecting surface waters away from the primary natural flow corridors, such activities were acting to unintentionally help recharge the underlying shallow aquifer system.

Coupled with these changes to the aquifer's ability to be replenished (recharged) there were subsequent dramatic increases in groundwater use**.** The dramatic increase in the number of wells for primary and supplemental irrigation rights acted to increase the amount of water coming out of groundwater storage. The net hydrologic impact of these changes was an aquifer-spring system that experienced reduced storage, as recharge was decreased and discharge was increased; creating an overall decline in storage that has manifested itself in a declining water table and the drying up of natural spring flows.

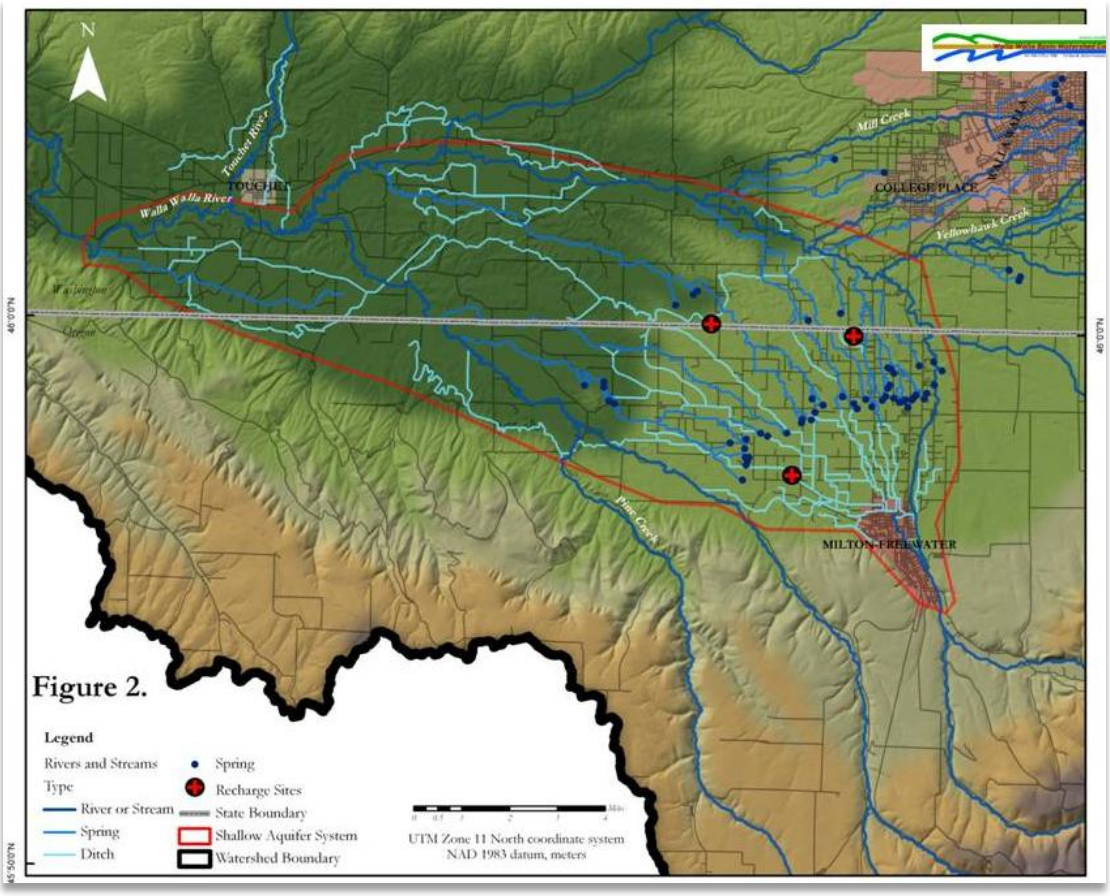


Figure 6. Bi-state Walla Walla and Little Walla Walla River System Area including Aquifer Recharge Testing (WWBWC)

While this surface to groundwater connection was first outlined by the USGS in 1933 (Piper, 1933) and again in 1965 (Newcomb, 1965) it was not revisited until the summer of 2000 that the community was forced to reexamine the situation. Starting with the ESA listing in 1998 and the *American Rivers* listing of the Walla Walla River on the top-10 most endangered rivers list in 2000, federal fish agencies worked out an agreement with the three larger irrigation districts to divert less water to these distributary branches and ditches and leave more in the 'mainstem' Walla Walla

River. This agreement re-watered an Oregon section of the river with 1/3 of the volume that had previously been diverted to irrigation during critically low summer-time base flows and was heralded nationally as a model of cooperation. However these dramatic changes in water management in the Little Walla Walla river system along with the piping of leaky ditches to stretch less water further had both immediate and longer term consequences. The springs that had been providing some baseflow (although not at historical potential) back to the Walla Walla River dramatically declined to the point that by 2009 many are nearly dry year round.

Through a series of public and WWBWC meetings, the WWBWC and its partners began to examine the historic conditions of these streams and their connection to the underlying alluvial aquifer; which they depend on for baseflow. Starting in 2001, the WWBWC and partners started developing a monitoring network and series of on-the-ground aquifer recharge projects designed to address these water management challenges. With the development of the Bi-state Watershed Management Initiative (WMI) Monitoring Program (2005 – present) a monitoring network currently comprising of over 110 wells and 50 stream flow gauges has been developed to monitor 'pre' and 'post' flow restoration conditions and provides the basis on which to build a programmatic solution**.** This program also funded a number of other technical activities from which to base the development of this program including: stratigraphy maps of the alluvial aquifer**,** a finite-element surface-groundwater numerical model (OSU) and various other field projects that help characterize the extent and properties of the shallow aquifer system.

Three main recharge projects have provided the basis upon which the WWBWC and its partners are now developing the Aquifer Replenishment and Spring Restoration (ARSR) Program (See Moving Forward Section)**.** The Hudson Bay District Improvement Company's (HBDIC) aquifer recharge project was the first of its kind in Oregon and Washington in both its physical design and its water quality monitoring plan (co-developed with ODEQ and OWRD staff). The HBDIC recharge project site, a 7-acre area Northwest of Milton-Freewater, is entering the final phase of its three part expansion under this program. The two other recharge testing projects funded by Washington's Department of Ecology include one testing field flooding[4] as a mechanism for aquifer recharge with the other using a historic gravel pit to recharge winter-spring water into groundwater storage. All of the sites have been providing detailed information on the designs, operations, monitoring and permitting-planning needs to implement aquifer recharge in the Walla Walla Basin.

Historical Trends in Walla Walla Basin Aquifer Hydrology and Hydrogeology Leading to Managed Aquifer Recharge

Generally the Walla Walla River, its tributaries, its distributaries and the shallow gravel aquifer they pass over are interpreted to be highly interconnected. Water moves relatively easily between ditches, streams, rivers and the shallow alluvial aquifer because of the highly permeable nature of gravel streambed channels so common across the Basin, and the gravelly character of the underlying alluvial aquifer system. Depending on the spatial variation in these streambed and aquifer conditions, the

[4] Hall-Wentland farm fields and the Locher Road historic gravel pit

degree of hydraulic connection between surface water and groundwater and the location of gaining and losing stream reaches generally can be defined by the depth to groundwater.

A survey of historical data shows changes in alluvial aquifer groundwater levels over time. WWBWC staff reviewed the existing data collected by Oregon Water Resources Department (OWRD) staff at historic observation wells originally set up by the United States Geological Survey (USGS). A total of 11 state observation wells (SOWs) that monitor the shallow, unconfined alluvial aquifer system were reviewed for trend information (**Figure** 7. Reviewing the data from the SOWs showed that all eleven wells display a downward trending water table with three (SOW # 844, 845, 857[5]) now having gone completely dry.

Taking a closer look at data from the OWRD SOW wells, SOW #850 shows approximately a 5 feet decline between 1940 and 2005 (**Figure** 8). The aquifer decline at this location is particularly

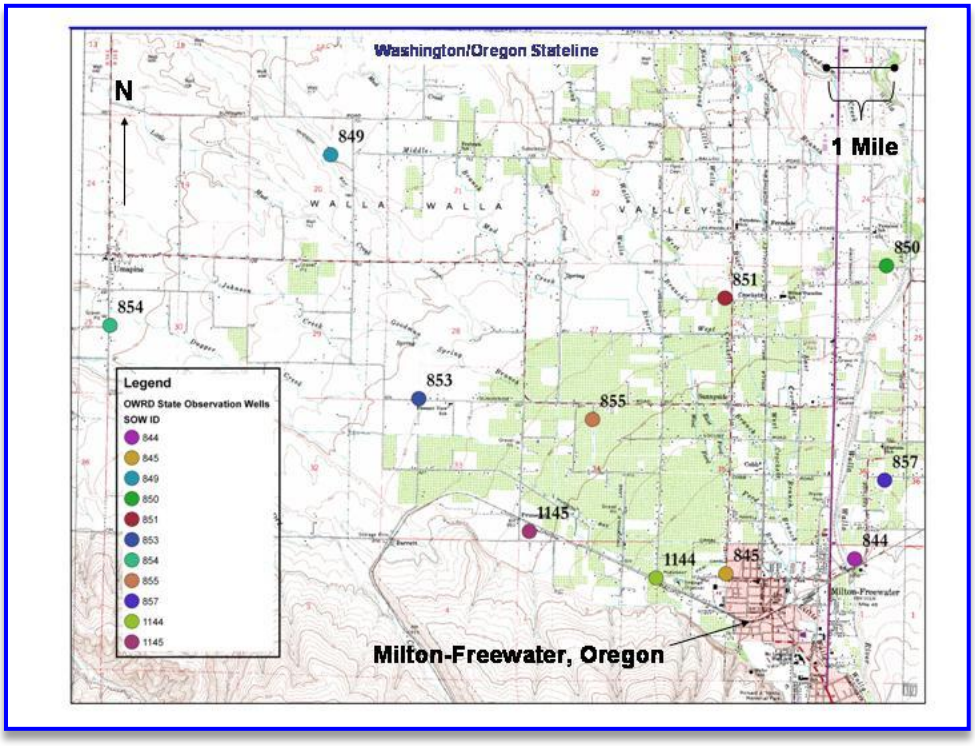


Figure 7. Site Map for Oregon Water Resources' State Observation Wells (1933 to present)

[5] SOWs 844 and 845 have since been abandoned and backfilled due to lack of water to measure and posed a safe hazard.

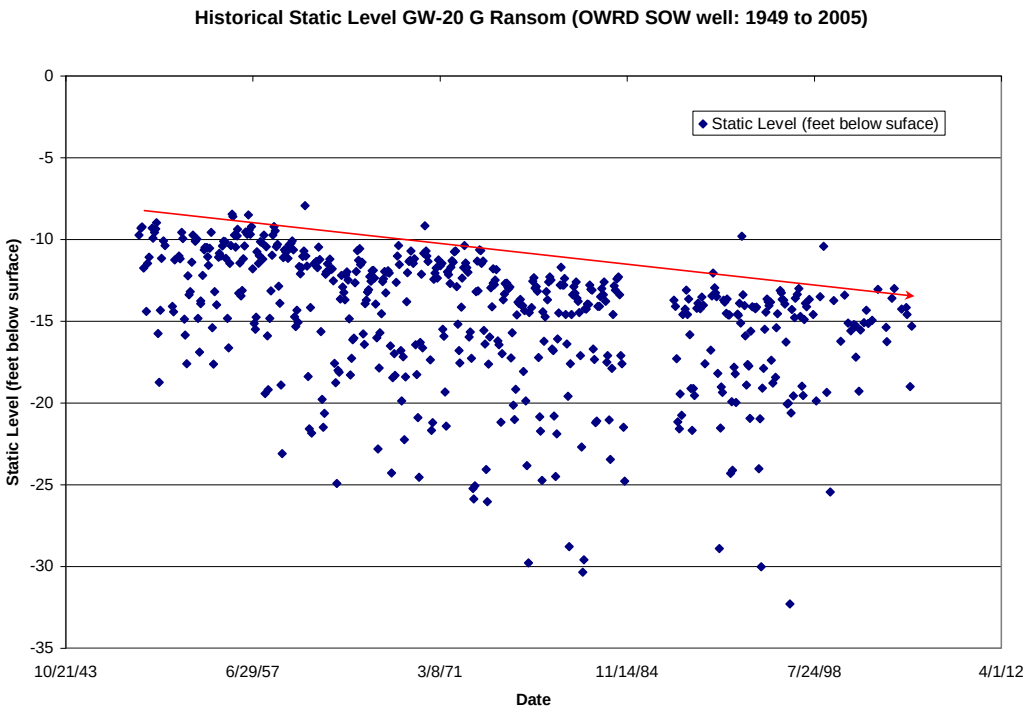


Figure 8. Depicting drop in aquifer at observation well next to Walla Walla River.

alarming because it is in an area near the Walla Walla River channel where considerable flow losses to the aquifer through the porous channel bottom is known to occur. Therefore, even with a steady source of recharge water available, aquifer level appears to be declining. This well location also sits on the geologic arc or contour of the 'inner zone springs'. Consequently, water level changes seen in it may provide insights into conditions expected within this zone of springs.

The well with one of the longer periods of record is SOW #853 (McKnight Well). It is located approximately 3 miles west, and down gradient from the Walla Walla River and Little Walla Walla River distributary system (**Figures** 7 and 9). The primary sources of recharge for this well generally are thought to include seepage from the Walla Walla River, the Little Walla Walla River, irrigation ditches and flood irrigation. This well demonstrates a characteristic found in nearly all of the historically hand-dug wells[6] in the Walla Walla River valley; alluvial aquifer water levels have dropped below the base of the well which was once productively producing water from the upper few feet of that aquifer. By 2001, this well was dry nearly year round with very little recovery during the winter-spring freshet period.

[6] Hand dug wells originally dug and utilized starting in the late 1800s. A typical design was a 6' x 6' hole, hand dug down to approximately 25-60 feet below ground surface. Water was originally extracted using a rope, pulley and bucket but later as combustion and electric water pumps became available, they were used to provide water for irrigation and domestic purposes. The WWBWC field staff, through working with numerous well owners around the valley, that a majority of these wells have been either outright abandoned, re-drilled deeper using casing and/or back filled all due to them having gone partially or completely dry.

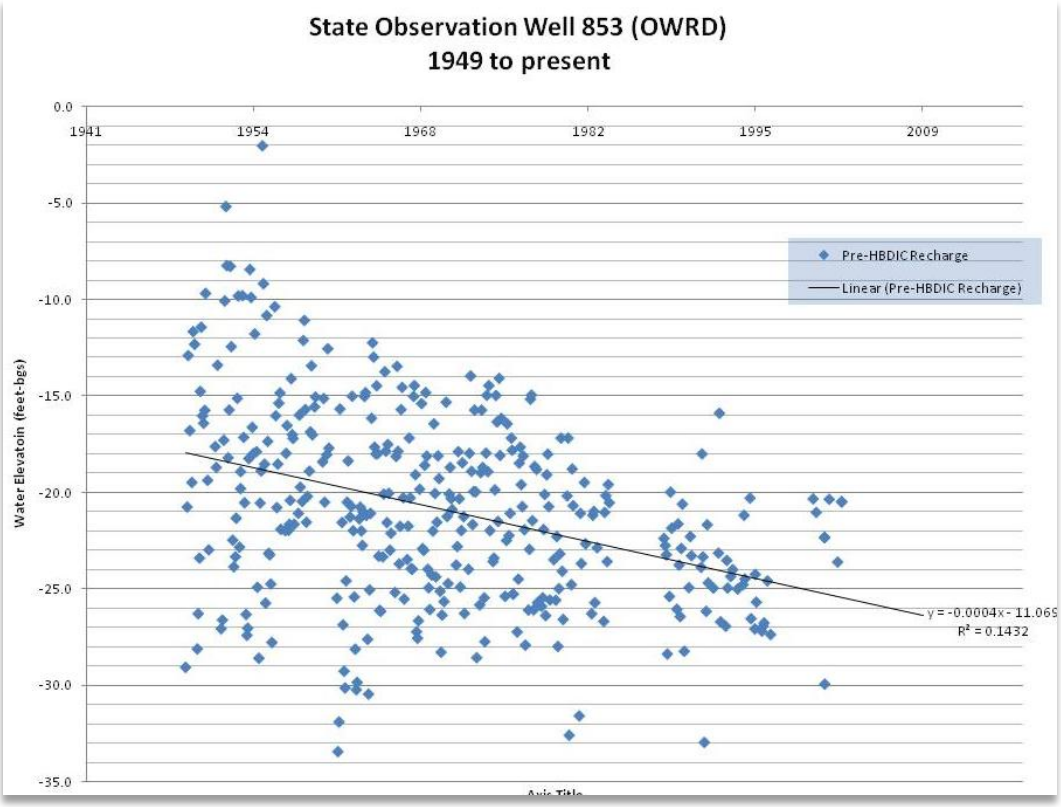


Figure 9. Oregon State Observation Well (SOW 853 – WWBWC #GW-17) showing historic declines of shallow aquifer water table.

Complementing the observation well data is the information provided by surface flow data collected at numerous springs across the Walla Walla River valley. Originally surveyed and measured by the USGS (Piper, 1933; Newcomb, 1965) these springs provide an excellent surficial indication of status of subsurface water supplies. In the early 1930s, Piper described these springs as a *"…integral part of the natural drainage system of the alluvial fan"* and likened them to *"the spillway of a reservoir, for they are supplied by overflow from the ground-water reservoir in the permeable alluvium… Consequently, the yield of the springs measures the decreased transmission capacity of the young alluvium."* (Piper, 1933)

He went on to note that well before his work in the 1930s, there were problem areas being identified with "*springs at the east end of the inner zone (Big Spring area) has decreased in the last 10-25 years.*[7]*"*, putting the start of the decline of the system somewhere around 1900. He also confronted the continuing debate that the springs were simply a product of up gradient water management practices such as flood irrigation by carefully noting: *"The regimen of the springs may well have been influenced in historic time by irrigation on the alluvial fans and flood plains but the springs were not created by that irrigation."* (Piper, 1933)

[7] The Big springs may have gone done due to more water being diverted to the East and West Prongs of the Little Walla Walla River, since the mainstem or Tum-a-lum Branch was used mainly in the winter for a flood control channel.

Walla Walla valley spring systems generally occur in two areas, the Little Walla Walla River and the Mill Creek– Yellowhawk Creek systems. The focus of this report is on the area Piper termed the "inner zone" where more than 30 springs occur on a contour-arc across the Walla Walla River alluvial fan near Milton-Freewater, Oregon (**Figure** 10). The hydrogeology created by a combination of geologic events, alluvial sedimentology and variation in hydraulic conductivity play significant roles in determining where and why these springs emerge.

Many of these *inner zone* springs are still flowing today, although their output has decreased significantly over the years. Piper measured these springs during his work in 1932-1934 which was continued until the early 1950s by the state of Oregon. Newcomb (USGS, 1965) contrasted Piper's measurements to that of his own and concluded:

"Under the natural and irrigation recharging of the 1930's and 1940s about 50,000 acre-feet of water passed through the gravel unit and flowed from the outlets during the average water year. Water diverted by pumping from wells has modified this formerly normal discharge as have changes in the recharge resulting from irrigation and other water regulation practices." (Newcomb, 1965)

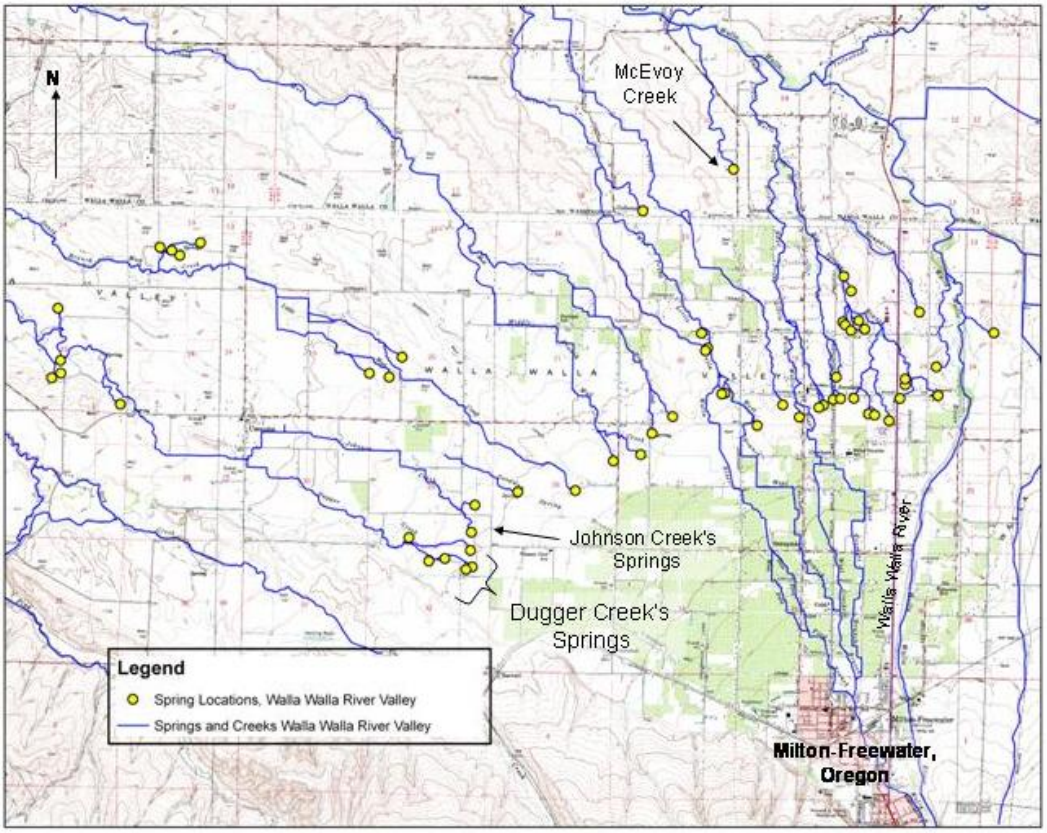


Figure 10. Map of Walla Walla River system spring-creeks (Oregon only), showing the basic distribution of the inner zone.

Starting in 2001, the WWBWC-Oregon State University Research team field surveyed these springs and set up flow monitoring stations at or as close as was feasible to where Piper had originally measured them. While the story tends to be the same across the inner zone spring system, the McEvoy Spring (just north of Washington/Oregon Stateline) is representative of their general degraded conditions. Measuring near the exact location measured in the 1930s, flows now represent a fraction of their historic averages (**Figure** 11). Also note the seasonal pattern of historical flows in McEvoy creek which are related to upgradient changes in irrigation water management and Little Walla Walla River flows.

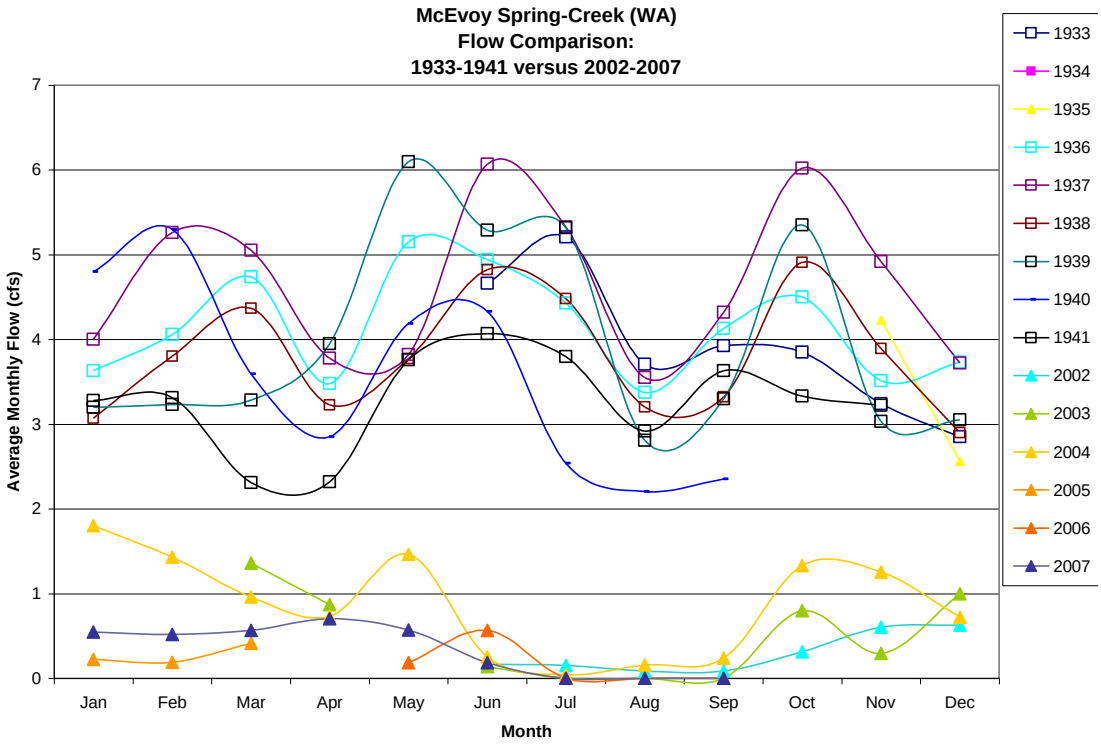


Figure 11. Historic versus Current Flow monitoring on McEvoy Spring Branch, tributary to the Walla Walla River

As of 2009, McEvoy Creek is often dry for a significant portion of the year. A local farmer and member of the Native Creek Society, Tom Page[8] was born, raised and still farms next to McEvoy Creek, and has publicly spoken many times about as his youth and being able to swim, fish for trout and irrigate out of the stream. Tom Page has worked to document the history of McEvoy Creek and many of the other valley spring-creeks providing some historical context to the loss of these natural resources.

"The namesake of McEvoy Spring Branch was John McEvoy. John McEvoy was married to Flora McBean, the daughter of William McBean. William McBean settled in the Walla Walla Valley in the 1840's when he worked for the Hudson's Bay Company. He was the Clerk in Charge at Fort Walla Walla at the time of

[8] Tom Page is the co-founder of the Native Creek Society, has led a riparian and stream morphology restoration project and is operations lead for the McEvoy Spring Creek Aquifer Recharge Testing project.

the Whitman Massacre in 1847. When he retired from Company service in 1851 he filed for a Donation Land Claim (#39), one of a handful in the Walla Walla Valley. It is interesting to note where he staked the boundaries of his claim, a mile square and 640 acres. His reasoning must have been to encompass the most possible water resources within its boundary." (Page, 2007)

Moving west on the contour-arc of the Walla Walla River springs and further from the major sources of recharged water; the flow volume situation gets significantly bleaker. Dugger Creek which is fed by springs that are the furthest west on the inner zone was measured in the early 1930s to be between 8-10 cfs through the summer season (USGS/OWRD data). The Dugger Creek drainage is now an area of high tension among water right holders due to what little irrigation season flows remain. Recently the WWBWC set up a gauge station directly at the site that Piper measured the 8-10 cfs, and in early July 2007 measured 2.1 cfs but by month's end the creek was completely dry.

Through the history of the Walla Walla basin there have been significant changes to the mechanisms that control both sides of this storage balance. Natural recharge has been altered in a number of ways, one of which is the historical manipulation of the streams and river's channel shapes and structures (**Figure** 12). Historically rivers were channelized for flood control structures, to increase agriculturally productive areas, and to allow for structures such as bridges and roads to be built. These actions while providing community benefits also resulted in rivers and streams that were shorter in length which in turn decreased the amount of resident-time that water was in the basin and available for recharge via channel bed infiltration. Additionally for decades the federal and states governments actively promoted the draining of wetland areas to increase agricultural production which also acted to reduce the recharge potential by decreasing the residence time water had in the basin.

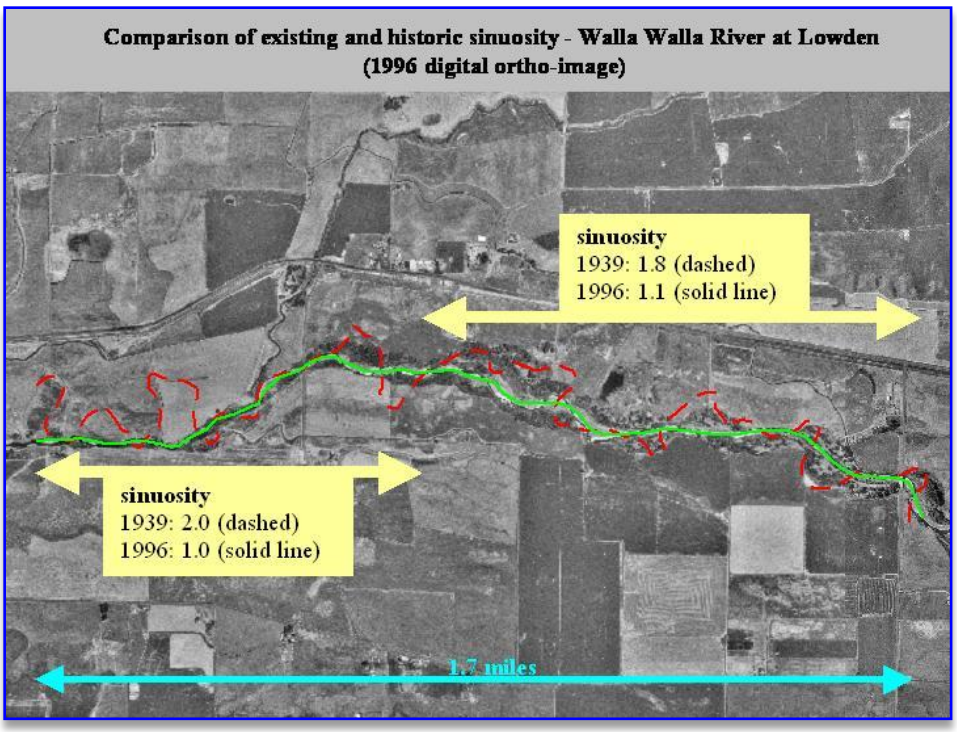
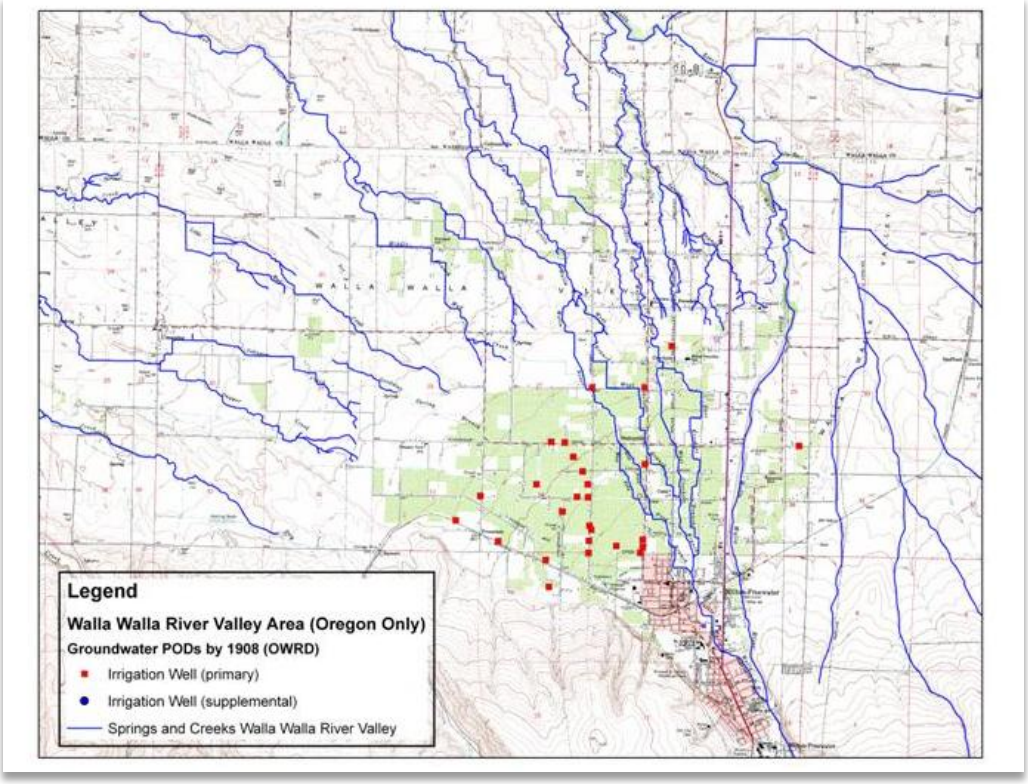


Figure 12. Comparison of the Walla Walla River meanders from 1939 to 2006 (ODEQ, 2006)

As irrigated agriculture became more prominent in the valley, the addition of lateral ditch systems and irrigation practices such as flood or rill irrigation acted to increase the recharge side of the balance. The USGS recently published a regionally relative report titled; *Estimates of ground-water recharge to the Yakima River Basin Aquifer System, Washington, for predevelopment and current land-use and land-cover conditions*.(USGS, 2006) In this report they quantified through modeling, the additional water contributed historically by irrigated agriculture to the groundwater storage balance. They estimated approximately a 38% (from 3.9 to 5.1 Million acre-feet) increase in recharged water entering the Yakima River aquifer from irrigation to that of pre-irrigation conditions. Therefore in the Walla Walla basin the expansion of irrigated agriculture has most likely added to the 'recharge' portion of the equation which has helped in part mediate for the dramatic increase in discharge or water use from the aquifer.

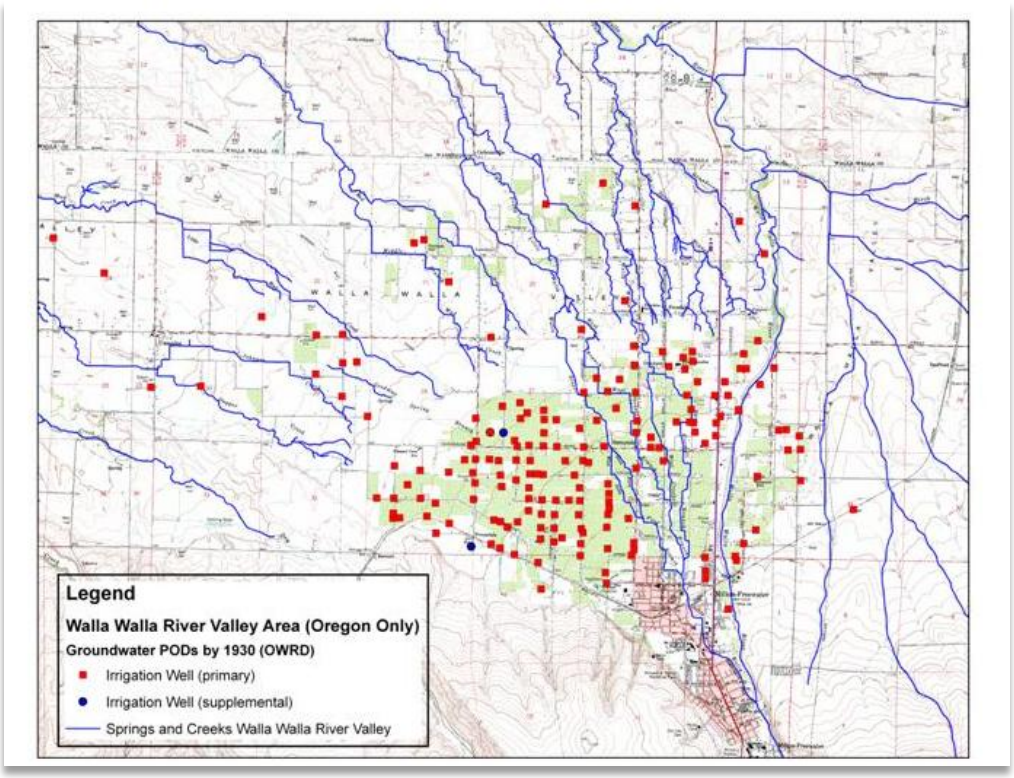
During the same period that irrigated agriculture was increasing the quantity of water being applied, the development of the aquifer's groundwater was taking place thus, increasing the discharge side of the storage balance (ΔS_G). Starting in the early 1900s, water wells were dug throughout the Walla Walla River valley for domestic, agricultural, municipal and industrial uses. Oregon Water Resource's Water Rights Information System (WRIS) database and Geological Information System (GIS) shows the numerous points of diversion (surface or groundwater) throughout the Oregon portion of the Walla Walla Basin, a significant majority of which are located in the Walla Walla River Valley.

Focusing specifically on Oregon's portion of the shallow aquifer, a WWBWC analysis of OWRD's WRIS GIS[9] database indicates that there are more than 650 permits[10] for irrigation wells with water rights totaling approximately 360 cfs, in the study area._Mapping this GIS information[11], **Figure** 13 (A, B, C, D) shows the historical progression of groundwater development in the Oregon portion of the shallow aquifer from 1908 to present. By 1908 primary irrigation wells were being permitted in the Walla Walla valley (**Figure** 13 A). About the time of the first hydrogeologic study of the basin (Piper, 1933), there was already a significant number of wells in the orchard area around Milton-Freewater (**Figure** 13B). When Newcomb was finishing his assessment, and Barker-McNish were starting their modeling project (USGS, 1976) permits for supplemental water rights, those used when the primary source (surface or groundwater) is no longer available due to lack of water, were becoming more prevalent for groundwater (**Figure** 13 C). And by December 31st, 2005, the permits for groundwater use had moved to all areas of the shallow aquifer system (**Figure** 13D).

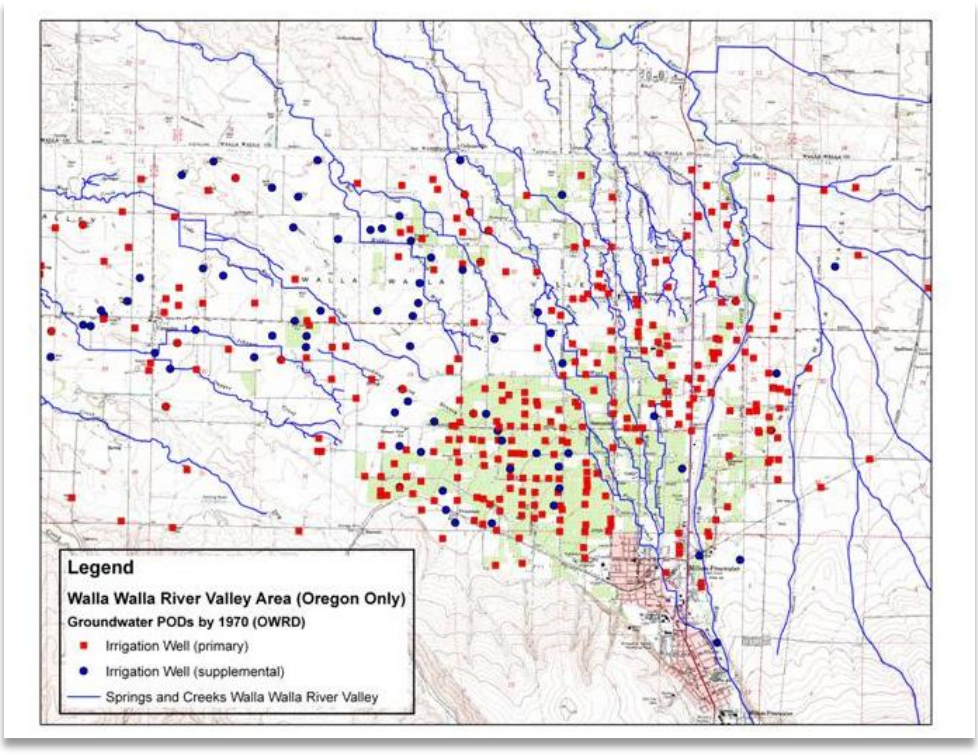


A. 1908

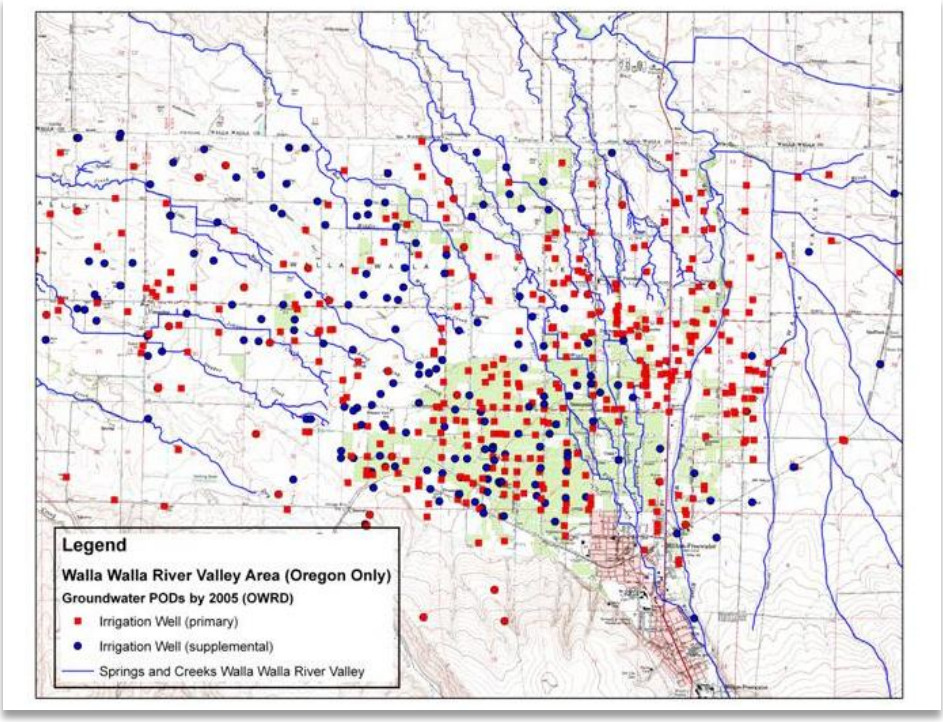
[9] http://www.wrd.state.or.us/OWRD/WR/wris.shtml
[10] Included in this data were wells cased into the confined, basalt aquifer system.
[11] Utilizing the GIS defined points of diversions and sorting them by priority date, a historical sequence of irrigation wells (water use codes IC, IS) was done by the WWBWC. Permits shown include those for wells drilled into the basalt, and do not include the exempt wells discussed by Wozniak.


Legend
Walla Walla River Valley Area (Oregon Only)
Groundwater PODs by 1930 (OWRD)
Irrigation Well (primary)
Irrigation Well (supplemental)
Springs and Creeks Walla Walla River Valley

B. 1930


Legend
Walla Walla River Valley Area (Oregon Only)
Groundwater PODs by 1970 (OWRD)
Irrigation Well (primary)
Irrigation Well (supplemental)
Springs and Creeks Walla Walla River Valley

C. 1970



D. 2005

Figure 13. (A, B, C, and D) Historical Progression of Groundwater Development - Oregon: 1903-2005 (WRIS Data, 2006)

Therefore the history of shallow aquifer development along with the surficial changes in water management has lead to dramatic changes to the shallow aquifer's water balance. The summation of these changes reflected in the historical groundwater levels and spring flows show a surface-groundwater system in decline.

What is Managed Aquifer Recharge?

In the western United States, managed aquifer recharge or MAR has been used for decades as a tool to help resolve water management issues. Three of the most common applications of recharge are for subsurface water storage and retrieval, offsetting salt water intrusion issues in impaired coastal aquifers, and mitigating for groundwater pollution issues. The objective of MAR is to capture and store available water into underlying aquifers and in the case of aquifer storage and recovery (ASR) retrieve that water for use when surface water is scarce. Some of the most common methods used to 'artificially' recharge groundwater are things such as engineered spreading basins, direct well injection and the use of streams and irrigation ditches as surficial water infiltration systems.

Water managers in many parts of the world have proven it to be cost effective way to capture and store water for these and many other water management needs. Significantly lower costs, land

availability, and surface associated environmental concerns have made it an attractive alternative to more conventional water management tools such as dammed surface reservoirs and desalination plants. In response to this growing demand the American Society of Civil Engineers has established a standardized set of guidelines for aquifer recharge for use as a water management tool in its publication titled *Standard Guidelines for Artificial Recharge of Groundwater* (ASCE, 2001). This publication gives a good general overview of the specific engineering, societal, and watershed planning issues associated with aquifer recharge and is an excellent place to start for those new to the field.

In the western United States two of the most prominent recharge projects occur in Orange County, California and in the Phoenix, Arizona metropolitan area. In southern California, Orange County Water District (OCWD) supplies water to millions of patrons via aquifer recharge and their renowned 'Groundwater Replenishment System[12] (**Figure** 14 and 15). In the technical circles of aquifer recharge, OWCD is often referred to as leaders in the application of aquifer recharge in the US, and many municipalities and other interested parties have toured and even trained with the OCWD staff to learn how they apply and maintain this tool for water management applications.

Their recharge program plays a large and critical role in supplying water on a year-to-year basis for their ever growing population:

"*Groundwater reserves are maintained by a recharge system, which replaces water that is pumped from wells. OCWD's facilities have a recharge capacity of approximately 300,000 acre-feet per year. About two million people depend on this source for more than three-quarters of their water. Groundwater producers (city water departments and other local agencies) pump water from the groundwater basin and deliver it by pipeline to consumers.*[13] *(OWCD)*

While they have more than 9 separate recharge facilities, one of the largest are some former gravel pits that were converted into an aquifer recharge facility and "*currently recharge up to approximately 120 to 140 cubic feet per second (cfs) when full*."[14]

[12] http://www.gwrsystem.com/about/background.html
[13] http://www.ocwd.com/_html/recharge.htm
[14] http://www.ocwd.com/_assets/_pdfs/_rfp/SantiagoCreekInitialStudy.pdf

Figure 14. Anaheim Lake, one of OCWD's *recharge basins* (Courtesy of OCWD website)

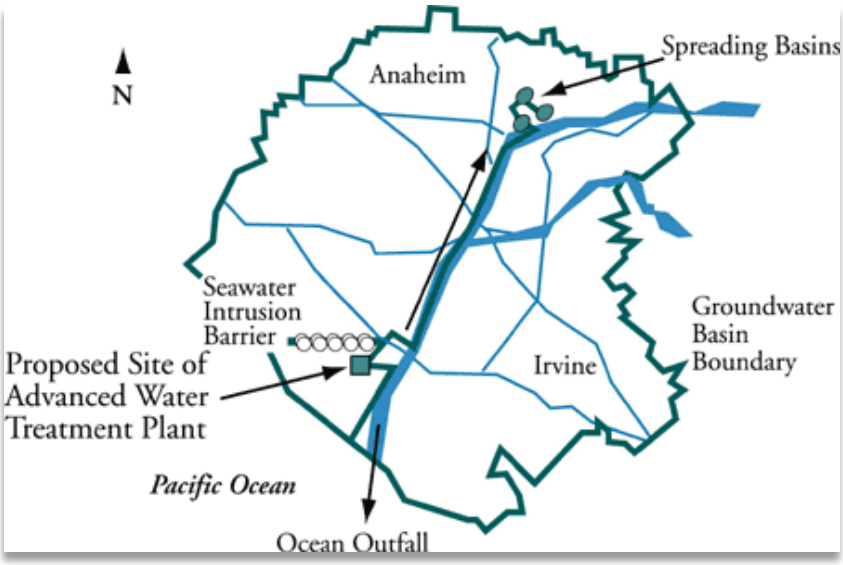


Figure 15. Map of OCWD's "Groundwater Replenishment System" (Courtesy OWCD website)

In the Phoenix Arizona metropolitan area aquifer recharge is also considered a critical component to its current and future water management planning needs. The Central Arizona Project or C.A.P.[15] project utilizes Arizona's allocation of Colorado River water (according to the multi-state, Colorado River Compact) to supply more than 1.5 million acre-feet annually to this region. Currently Arizona is not exercising its full allocation of Colorado River water rights. The unused portion which is in excess of 460,000 acre-feet annually is going to a multiple spreading basin aquifer recharge program, storing it for future use. The CAP program refers to aquifer recharge as playing:

[15] http://www.cap-az.com/index.cfm

"Recharge is a long-established and effective water management tool that allows renewable surface water supplies, such as Colorado River water, to be stored underground now for recovery later during periods of reduced water supply."[16]

During August 2006, the WWBWC staff hydrologist participated in a tour of two CAP recharge projects just outside of Phoenix (**Figure** 16). A CAP hydrogeologist and project manager provided informative demonstration of projects whose geologic and hydrologic settings were similar to those experienced in the Walla Walla basin. This information has proven useful in the continued refinement of our local design efforts of this tool and application for our current water management issues.

Figure 16. August, 2006, WWBWC staff toured the Aqua Fria Recharge Project outside Phoenix Arizona (Courtesy C.A.P. website)

Locally MAR was first explored in the 1970s by the City of Walla Walla who began testing and implementing a direct injection Aquifer Storage and Recovery (ASR) program. This program stores water in the basalt aquifer during the high flow portions of the water year and then reclaims the water during the high demand summer season.

The list of national and international water programs that feature aquifer recharge as one of their management tools is extensive and too numerous to cover in this report. Setting up a system that complements and enhances the other water management strategies for the Walla Walla basin is merely a matter of designing and collaborating to find better ways to store water. With a better understanding of MAR application elsewhere, we can begin to discuss the water issues facing the basin and its intended application in solving those problems.

[16] http://www.cap-az.com/static/index.cfm?contentID=81

Managed Aquifer Recharge – Not a New Idea

From these early assessments documenting the decline of the aquifer and associated springs artificial aquifer recharge was considered early in the assessment process as it was recommended by the USGS in 1965. R.C. Newcomb's' report titled *Geology and Ground-Water Resources of the Walla Walla River Basin Washington-Oregon* (USGS, 1965) is considered to be one of the most comprehensive assessment of the Walla Walla basin's water resources. R.C. Newcomb, who was highly respected in his time, had worked extensively in the arid American west assessing the geology and hydrology of many hydrologic systems. He was an early proponent for using our understandings of subsurface geologic features to store and manage water resources. Before coming to the Walla Walla basin, he had worked elsewhere in the Columbia basin and published a series of studies, one of which was titled: *Storage of ground water behind subsurface dams in the Columbia River basalt, Washington, Oregon, and Idaho, by R.C. Newcomb* (USGS, 1961), demonstrating his innovative approach to finding cost effective ways of better managing water. For the Walla Walla basin he observed:

"Some initial tests at artificially recharging the gravel aquifers by placing excess surface water into gravel pits and onto unused gravelly fields have reportedly helped raise temporarily the water level in wells of their vicinities. A comprehensive plan for the systematic management of the old gravel as a water reservoir is an obvious need that will surely come about ultimately. Such a comprehensive plan and systematic management will need to include all phases of natural and artificial recharge in order to obtain maximum benefits from this important natural water-storage facility."(USGS, 1965)

It was from Newcomb's early discussion of the potential of aquifer recharge that led the WWBWC and HBDIC to begin testing this tool. Additional interest was generated when further investigation revealed that there were other projects in the western United States (as discussed earlier) that had proven track records in recharge. Starting in 2003, a series of grants from the Oregon Watershed Enhancement Board (OWEB), the Walla Walla Watershed Alliance (WWWA) and in-kind contributions from the Hudson Bay District Improvement Company (HBDIC) allowed for the first successful limited testing license application, and subsequent installation and operation of the Hudson Bay Aquifer Recharge Project. The following sections will discuss the issues associated with aquifer recharge, the HBDIC project results to date, and aquifer recharge potential as a water management tool.

PART II. THE HBDIC ALLUVIAL AQUIFER RECHARGE PROJECT

Testing Managed Aquifer Recharge: HBDIC Site Operations and Monitoring (2004-9)

The Hudson Bay District Improvement Company (HBDIC) partnering with the Walla Walla Basin Watershed Council (WWBWC) sought and secured grant funding to test aquifer recharge starting in 2003. This project has been successfully operated for 6 recharge seasons and has been the main focus of the testing of MAR in the Walla Walla basin. This section reviews the results collected from the 2004-9 testing and helps provide the reader with a sense of how and what is monitored when testing MAR. There are two primary testing areas at the HBDIC Recharge Site; the spreading basins and the infiltration gallery testing areas. While the spreading basins have been operating since 2004, the infiltration galleries are relatively new being built during the 2008-9 recharge season.

To understand the application of aquifer recharge, hydrogeologic information about the aquifer-river system in the Walla Walla basin must be reviewed. For the purposes of simplification, this discussion focuses on the upper portion of the alluvial aquifer system, which is that portion of the alluvial system where groundwater is generally unconfined and hosted by gravelly strata. The basalt aquifer system will not be included in this discussion as its connection to surface water likely is minimal within the Walla Walla Basin (GSI, 2007). The deeper alluvial system also will not be discussed as it is at least semi-confined, hosted in and below extensive clayed strata, and probably has limited continuity to surface waters.

One of the first orders of business in defining the hydrogeology is to map the subsurface geologic features that influence the aquifer of interest. This subsurface mapping, sometimes referred to as hydrostratigraphic mapping, provides a three-dimensional, spatially-relevant description of the various layers (lenses, beds, formations) that comprise, or host, the aquifer system. Originally mapped by Newcomb in 1965, the alluvial aquifer system in the Walla Walla Basin generally is found within a mix of older river deposited (alluvial) clay, silt, sand, and gravel from the Blue Mountains, Missoula cataclysmic flood deposited silt and sand, and wind-blown loess.

The shallow or alluvial-aquifer system for our study area is present within a topographical depression, roughly triangular in shape bounded on the east by the Blue Mountains, the south and southwest by the Horse Heavens Hills, and the north and northwest by the Palouse slope. This alluvial aquifer system generally slopes from east to west, down the length of the Basin. The sloping aquifer receives most of its recharge from the Walla Walla River and Mill Creek drainages, although additional flow enters via the other smaller tributary drainages and through the subsurface. The water table gradient is generally east to west and its general movement is depicted in **Figure** 17. The basin has what we refer to as down gradient 'pinch point' through which surface water and groundwater eventually moves through. This point lies where the Walla Walla River crosses basalt outcrops at the base of Nine Mile Hill. The alluvial aquifer generally is considered to be *unconfined*, which means that it is open to

receive water from the surface; and whose water table surface is free to fluctuate up and down, depending on the recharge/discharge rate. This condition is more prevalent in the upper portions of the valley and grows less so the further down gradient and west you move through the system due to increasing proportion of finer grained alluvium.

In 2007, utilizing funding from the Washington Department of Ecology and Oregon Watershed Enhancement Board, GSI Water Solutions Inc. completed a hydrostratigraphic mapping project of the Walla Walla River valley alluvial aquifer system (GSI, 2007). Five basic hydrostratigraphic units were defined and mapped in the alluvial aquifer system. All of these are sedimentary strata (e.g., clay, silt, sand, and gravel lithologies) overlying basalt bedrock, and sometimes referred to as the suprabasalt sediments. The five suprabasalt sediment units mapped for this project are the: (1) Quaternary fine unit, (2) Quaternary coarse unit, (3) Mio-Pliocene upper coarse unit, (4) Mio-Pliocene fine unit, and (5) Mio-Pliocene lower coarse unit. The terms Quaternary and Mio-Pliocene refer to geological time periods, Quaternary representing from 2 Million years ago till present, and the Mio-Pliocene referring to the late Pliocene through the Miocene periods (10.5 to 3.5 Million years ago). The younger Quaternary sedimentary units are on top of the older, Mio-Pliocene units (**Figure** 18 and 19).

An often used analogy for this alluvial aquifer system is to picture a large, multi-layered, silty, sandy, and gravel-to-cobble filled bath tub, with basalt bedrock acting as the walls and bottom of the tub. The structure contour map of the top of basalt clearly shows the shape of this basalt bath tub (**Figure** 20). This map also depicts the major folds and faults that influence the lateral continuity of the basalt bedrock and the overlying suprabasalt sediments. The degree of hydraulic continuity between the basalt (which hosts a variety of confined aquifers) and the suprabasalt (or alluvial) aquifer system is not well understood.

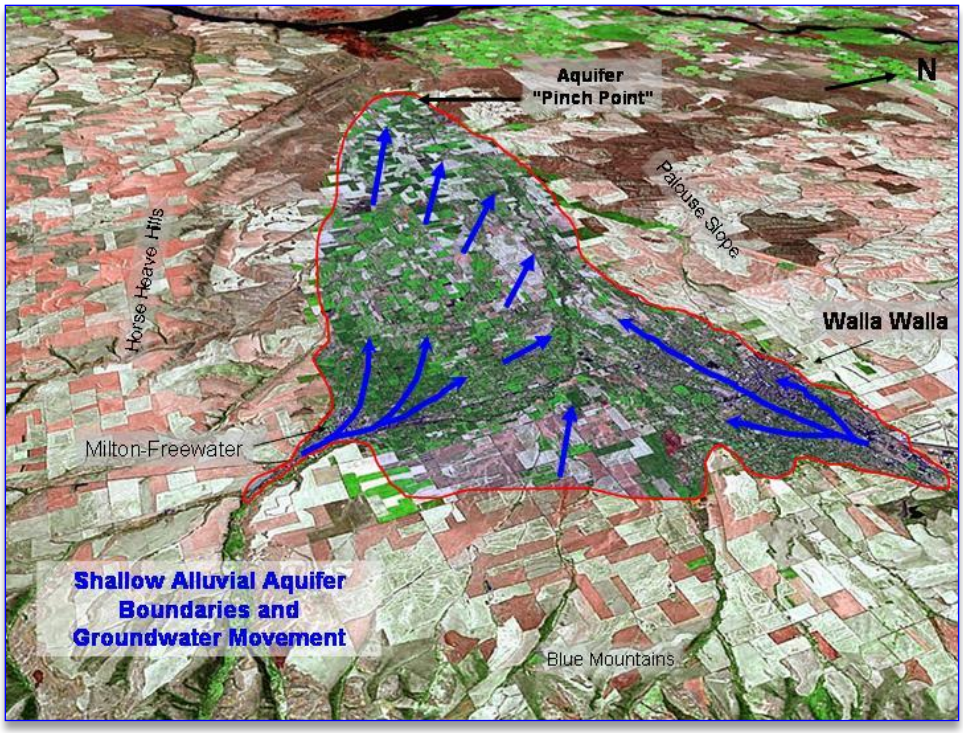


Figure 17. Walla Walla River valley shallow aquifer system.

Water is found in all of the sediment layers comprising the alluvial aquifer system, but it moves easiest through gravelly portions, which are most abundant near the surface. In addition to water moving through the gravel, water is also flowing in and out of it, moving between the gravel alluvial aquifer and water flowing over the surface in the form of rivers, streams and ditches. Because the system is pitched slightly toward the Columbia River, both the surface water and groundwater drain toward it. The thickest of the coarse alluvial hydrostratigraphic units is the Mio-Pliocene Upper Coarse Unit (**Figure** 19). These coarse strata form the primary unit in which alluvial groundwater is found in the Basin. For more information about the specific geologic information on the shallow aquifer please refer to Groundwater Solutions' report: *Geologic setting of the Miocene (?) to Recent Suprabasalt Sediments of the Walla Walla Basin, Southeastern Washington and Northeastern Oregon.* (GSI, 2007).

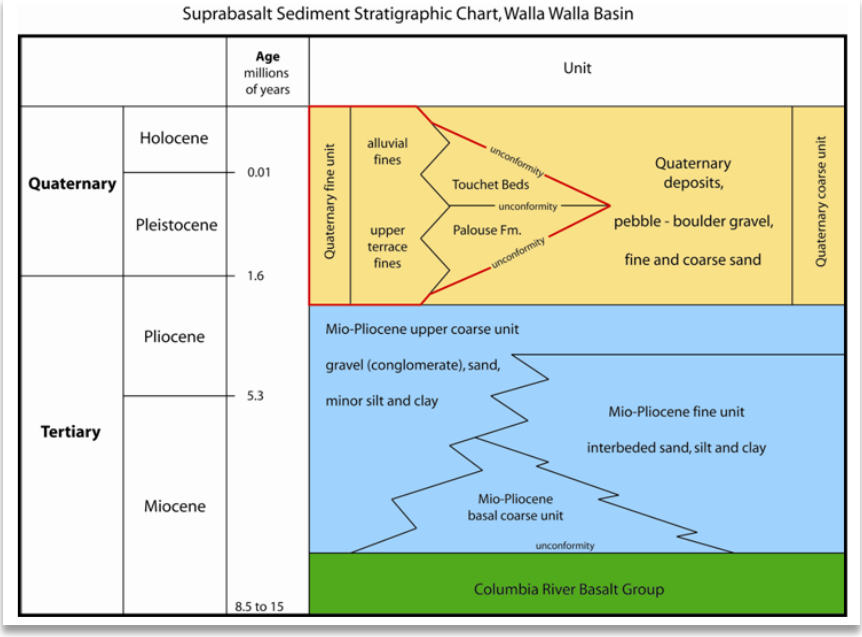


Figure 18 Sediment Stratigraphic Chart of the Walla Walla shallow aquifer units (GSI INC et. al., 2007)

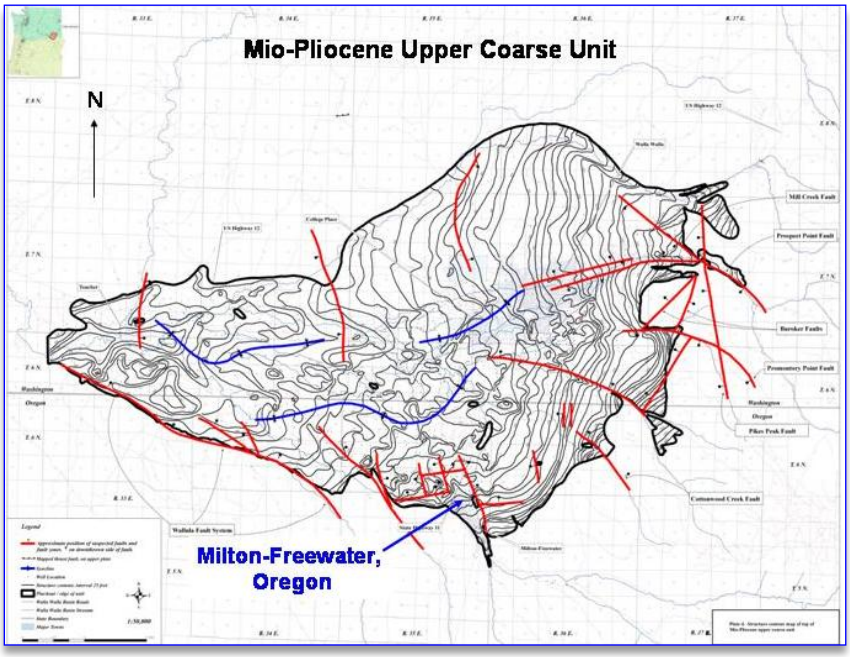


Figure 19. Major sedimentary layer of the Walla Walla River Valley Shallow Aquifer. (GSI, 2007)

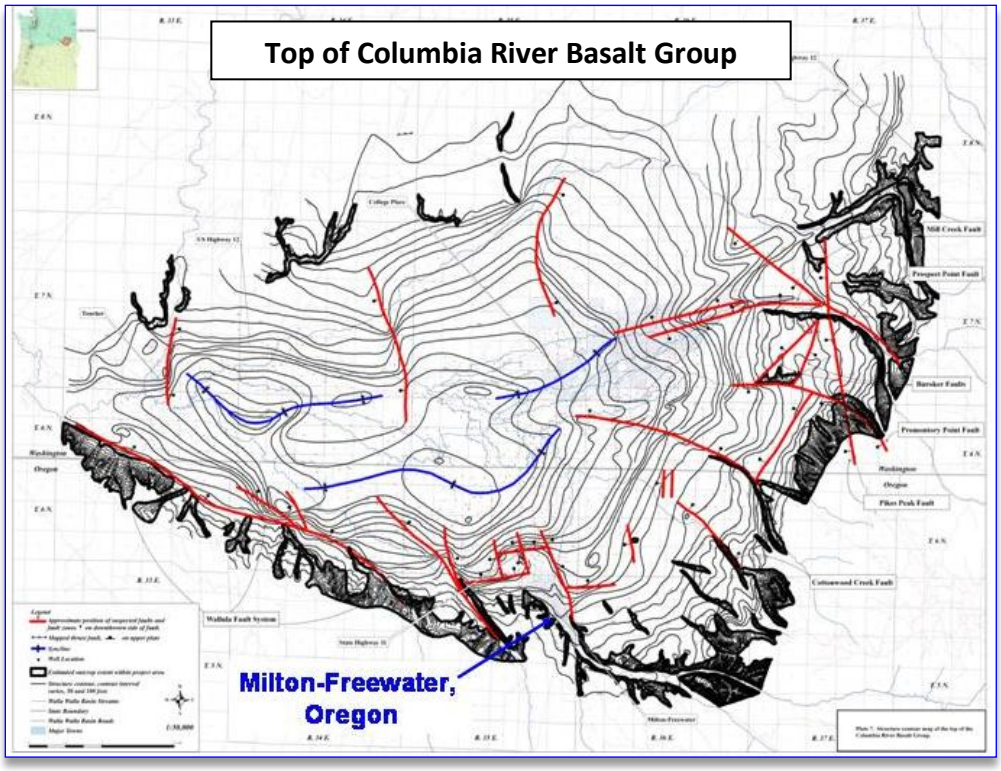


Figure 20. Top of Columbia River basalt, or bedrock boundary for shallow aquifer (GSI, 2007)

Site Specific Hydrogeology and Geology

This section summarizes site specific geologic and hydrogeologic conditions, and is based on fieldwork at the Site and the basin wide hydrostratigraphic mapping presented in GSI (2007). The geologic cross-section in **Figure** 21 was derived from this hydrostratigraphic mapping effort.

The uppermost geologic unit in the Test Site area is a sequence of interstratified silt and sand (Touchet Beds) comprising the Quaternary fine unit. However, at the site itself, these strata are absent and the uppermost unit is the coarse Quaternary unit. The coarse Quaternary unit at the Site consists of basaltic, sandy to clayey, uncemented gravel. Beneath the Test Site, geologic logging during site specific monitoring well drilling showed that these uncemented strata are approximately 20 feet-thick. The basin-wide mapping effort suggests these strata thicken to the west of the site.

Uncemented strata of the coarse Quaternary unit are underlain by the variably indurated (uncemented to cemented) Mio-Pliocene upper coarse unit. Site specific monitoring wells drilled for the project do not fully penetrate this unit. However, basin-wide hydrostratigraphic mapping (GSI, 2007) suggests this unit is approximately 150 to 160 feet thick in the immediate vicinity of the Site. Based on regional trends, interpretations of driller's logs, and our geologic logging of drill cuttings samples collected from recently drilled wells in the general area, the Mio-Pliocene upper coarse unit consists of variably indurated, weakly to moderately cemented, silty to sandy, indurated gravel (conglomerate). This unit is the primary host unit for the alluvial aquifer system in the general vicinity of the Site. The

coarse Quaternary unit – Mio-Pliocene upper coarse unit contact was identified using the following combination of criteria:

- A notable change in cuttings color from gray dominated hues to brown and yellow-brown hues
- Presence of cemented sand clasts and sand cemented to pebble and cobble clasts in the cuttings samples
- Increased mud content in the fine fraction of the cuttings
- Generally better air circulation reported by the driller

The functional base of the upper portion of the alluvial aquifer system in the area of the Site is essentially the top of the Mio-Pliocene fine unit. The contact between this unit and the overlying Mio-Pliocene upper coarse unit is predicted to lie approximately 200 feet below ground surface at the Site. Although there will be a degree of hydraulic continuity between these two units, the prevalence of laterally extensive clay and silt lithologies in the fine unit limits this.

The deepest part of the alluvial aquifer system in the Site area is hosted within a locally occurring coarse interval referred to as the Mio-Pliocene basalt coarse unit. This unit differs from the upper coarse unit. It is generally felsic, displaying thin (<10 feet thick) quartz sand layers. It also is saturated and may indeed make a locally productive water-bearing interval. However, the thickness and wide lateral extent of the overlying fine unit is inferred to greatly limit the hydraulic connection of this unit to the upper coarse unit and surface waters.

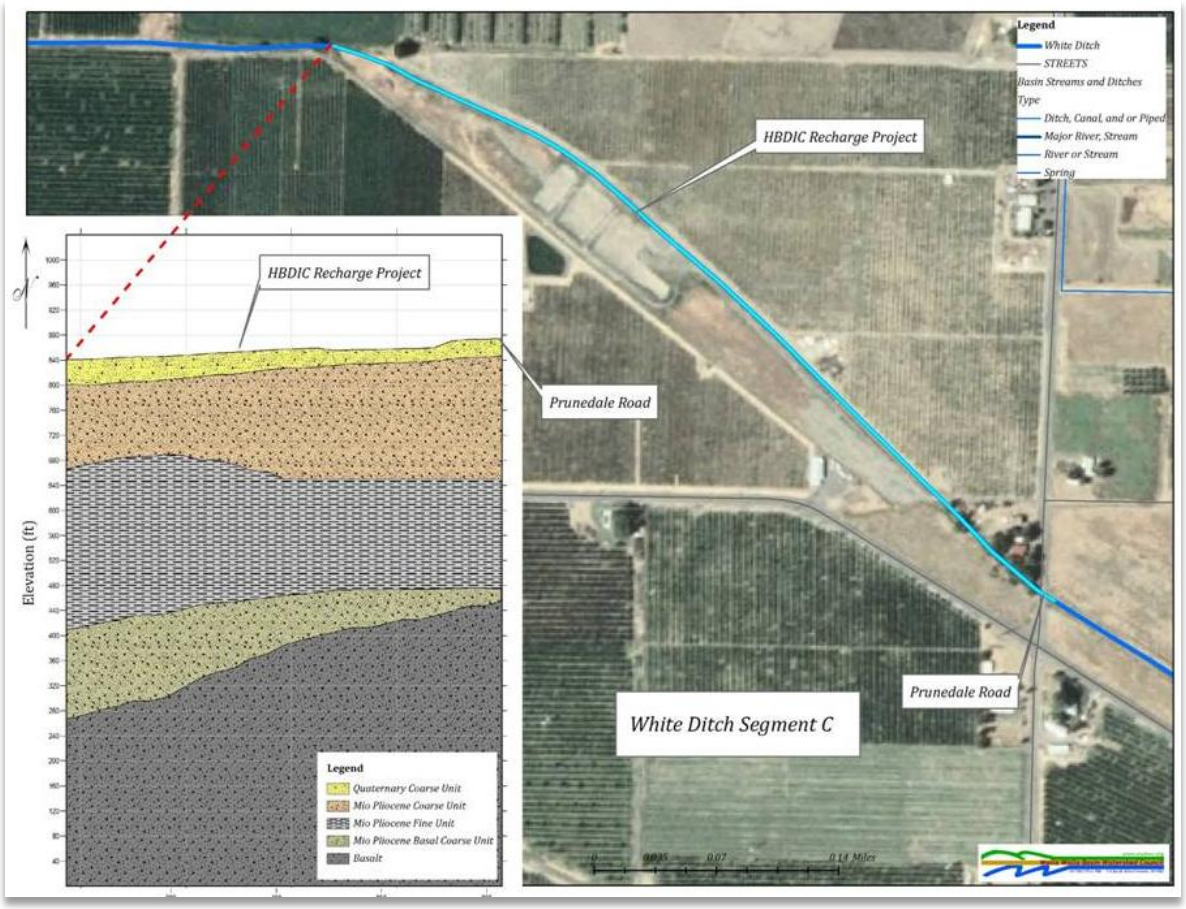


Figure 21. Geologic Transect of White Ditch at HBDIC Recharge Site (Baker T. , 2010)

A number of studies and reports have looked at the hydrologic conditions of the various geologic stratigraphy mentioned above. The most recent work was done by the WWBWC-OSU team as portion of the Integrated Surface Water-Groundwater Flow Model (IWFM) project in 2006-8 (Petrides, 2008). A series of aquifer tests were performed at various times of the year including a 72-hour constant-rate pumping test and a step-drawdown pumping test at observation well #1 (GW-46) on the HBDIC Recharge site. The hydraulic conductivity value from that testing of the upper two layers of the aquifer ranged from 22 – 34 meters/day with a groundwater velocity at approximately 1 meter day. Other estimates of hydraulic conductivity are based on modeling and literature reviews. The USGS estimated values from their modeling exercise (MacNish, 1976) gave ranges (depending on geologic unit) from 4 - 65.84 meters/day. The literature (Bear, 1972) provides values for unconsolidated sand and gravel in 10^1 meters/day with the EPA (EPA, 1986) estimating 27 - 30 meters/day (Petrides, 2008).

The HBDIC Alluvial Aquifer Recharge Site

Overview

Starting in 2004, the HBDIC Recharge site was operated over 6 consecutive seasons. The site began operations in March of 2004 after receiving the OWRD limited testing license (OWRD #LL-758) in

February 2004 and construction being completed as the project was first turned on in March 2004. This first season was unlike the subsequent seasons because the site was being operated even before it was completed. This was mainly due to the HBDIC-WWBWC team wanting to get some aquifer recharge testing completed before the shut off date of May 15th, 2004. From 2005-2009 site construction was done during the winter shutdown period (February 1st onward) or done parallel to the site being operated. The site was expanded twice during this period. The first (2004-5 season) from 0.34 acres to 1.1 acres when the three original 50' x 100' spreading basins (**Figure** 22) were expanded, with spreading basin #1 being more than tripled in size. During the 2005-6 seasons, a fourth basin was added bringing the total basin area to 1.4 acres with an average depth between 5'- 7'.

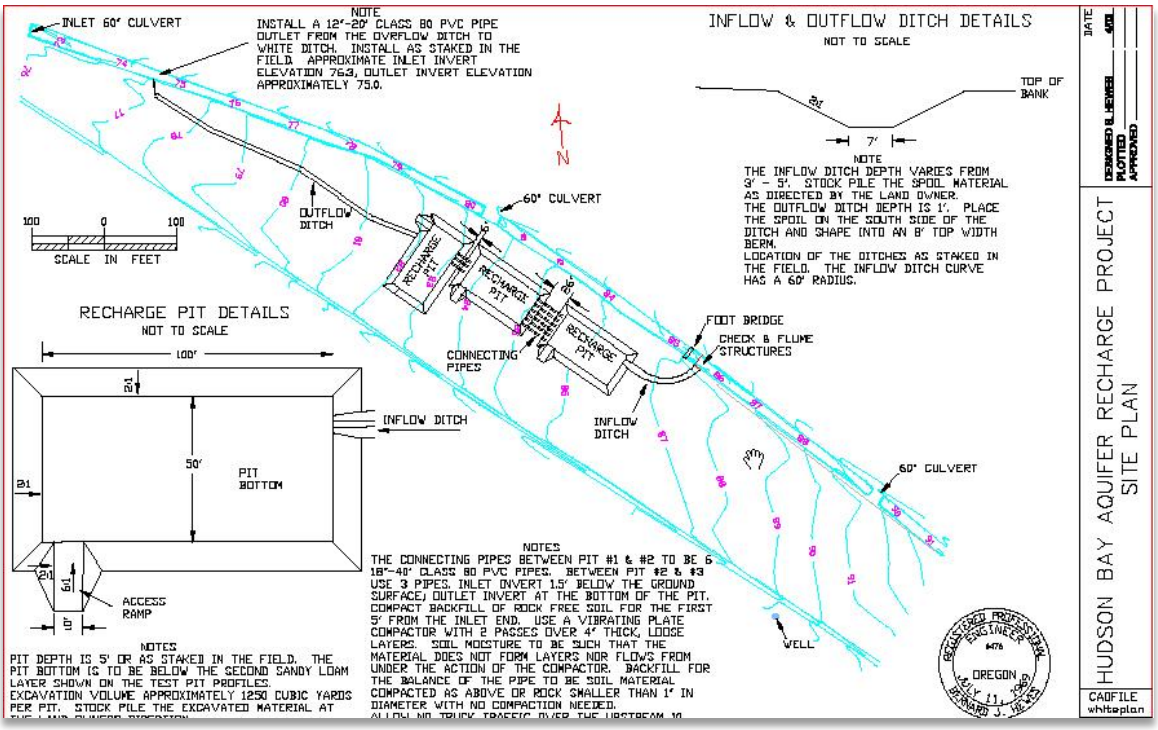


Figure 22. Original HBDIC Site Designs 2003 – Engineering by Bernie Hewes, PE Oregon

The spreading basins were operated successfully for 5 recharge seasons until the summer of 2008 just before the original OWRD limited testing license expired (February 2009). The HBDIC-WWBWC team informed OWRD resources that it intended to submit for a water right for the site through their department, the logical progression after successful limited license testing. Due to limitations in the OWRD Umatilla Basin Rules for the Walla Walla basin restricting aquifer recharge in this portion of the watershed, OWRD put together a Rules Advisory Committee (RAC) during the summer 2008. The Confederated Tribes of the Umatilla Indian reservation voiced concerns over aquifer recharge competing for non-irrigation season flows with a reservoir feasibility study they have been working on with the United States Army Corps of Engineers-Walla Walla (USACE). After several RAC meetings, it was decided that the HBDIC-WWBWC team would request another OWRD Limited testing License whilst awaiting the

CTUIR-USACE team to further work out their feasibility study details. This was applied for during the winter 2009 and received in time to operate the remaining of the 2008-9 recharge season. Since that decision, the CTUIR-USACE are advocating the Columbia River Pumping exchange project instead of the Pine Creek Reservoir, thus removing the potential for a water availability conflict between the two programs. Negotiations between the OWRD, HBDIC-WWBWC and CTUIR-USACE teams will now need to commence during this current limited license in order to allow the HBDIC project to apply for and receive a successful water right. Additionally through the collaboration of the groups mentioned above, aquifer recharge is now included in the CTUIR-USACE feasibility study to help protect and enhance Walla Walla River flows for salmon recovery. Currently no RAC meetings are scheduled but will need to be conducted before summer 2013 in order for the HBDIC site to receive a water right.

Starting in the fall of 2008, a portion of the HBDIC recharge site has been used as a test location for examining and comparing the performance of four different types of shallow aquifer recharge infiltration galleries. This test area is shown in **Figure** 23 below. Many of the local irrigators would like to implement shallow aquifer recharge on their farms, but do not have the space for spreading basins. Subsurface Infiltration galleries are being tested on the HBDIC site as a potential solution. A diagram in Appendix III shows the layout of the four galleries, water turnout, the location of meters, and piezometers to track groundwater responses.

Spreading Basins Operations

The HBDIC site consists of two operating areas, the first being the spreading basins the main focus of this document, with the second area designated for infiltration gallery testing, which will be covered in more detail in a later section. To conduct the recharge testing, the HBDIC project can divert a total of up to 50 cfs (OWRD LL#1059) from the Walla Walla River at the Little Walla Walla Diversion (OWRD # 14012100) during the November 1st through May 15th recharge period. OWRD, in the limited license, established minimum instream flows for the Walla Walla River that must be met at the Nursery Bridge (M-4) gauge (**Figure** 23) downstream of the HBDIC diversion. These minimum instream flows were determined through the OWRD limited testing license process in 2004 in consultation with Oregon Water Resources Department (OWRD), Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Environmental Protection (ODEQ) and the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). Minimum instream flows are only applicable to this project and any other OWRD water right currently diverting water from the Walla Walla River.

Other instream flow agreements such as the one completed under Civil Penalty agreement between the US Fish and Wildlife Service (USFWS) and the three main irrigation districts on the river do not apply to the HBDIC Recharge site Limited License requirements. The minimum instream flows and their applicable diversion periods for the HBDIC recharge site are listed in Table 1.

HBDIC Recharge Site Legal Diversion Periods	Minimum Walla Walla River Flow (cfs)
November 1st through November 30th	65 cfs
December 1st through January 31st	95 cfs
February 1st through May 15th	**150 cfs**

Table 1. HBDIC Minimum Instream Flow Requirements

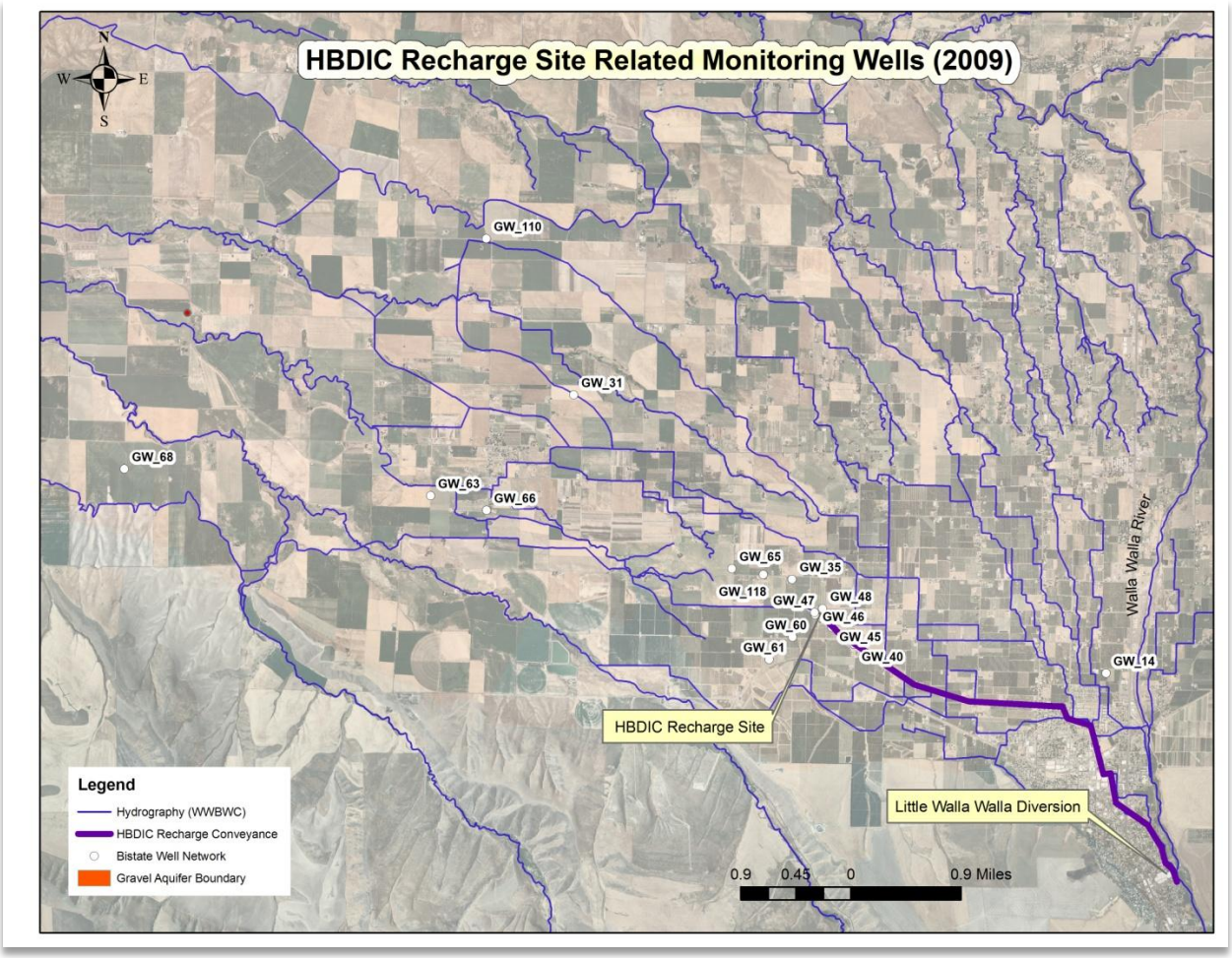


Figure 23. Map of HBDIC Recharge site and Source Water Delivery System

Figure 24 shows the average daily flow volumes for the Walla Walla River compared to those of the Little Walla Walla Diversion and the HBDIC recharge site flows for 2009 water year. Walla Walla

River Irrigation District and Hudson Bay District Improvement Company both divert a majority of their water rights at the Little Walla Walla River site at Cemetery Bridge (OWRD Gauge # 14012100). HBDIC White Ditch diverts water from the Little Walla Walla system at the OWRD HBDIC Gauge (OWRD Gauge # 14012300). The HBDIC recharge project diverts water from the White Ditch based on the instream flow values and other water user's priority as described earlier. HBDIC recharge flows represent only a small fraction of the total flow in the Walla Walla River during the November through May 15th operating period (**Figure** 24).

From the Little Walla Walla diversion, HBDIC recharge water flows to a split in the Little Walla Walla River system called the frog. At the frog HBDIC has an OWRD operated gauge station (OWRD # 14012300) to help monitor and manage their water use off the Little Walla Walla River system. The recharge water then flows into the White Ditch, HBDIC's main canal which flows for about 2.5 miles to the site's intake (**Figure** 25). The water then flows through the project filling the basins SP-1, SP-1B SP-2, SP-3, SP-4 with excessive water tailing back into the White Ditch. The intake and flow between each of the basins is maintained by HBDIC field staff and is controlled using a series of weir boards to control rates of flow in and through the project.

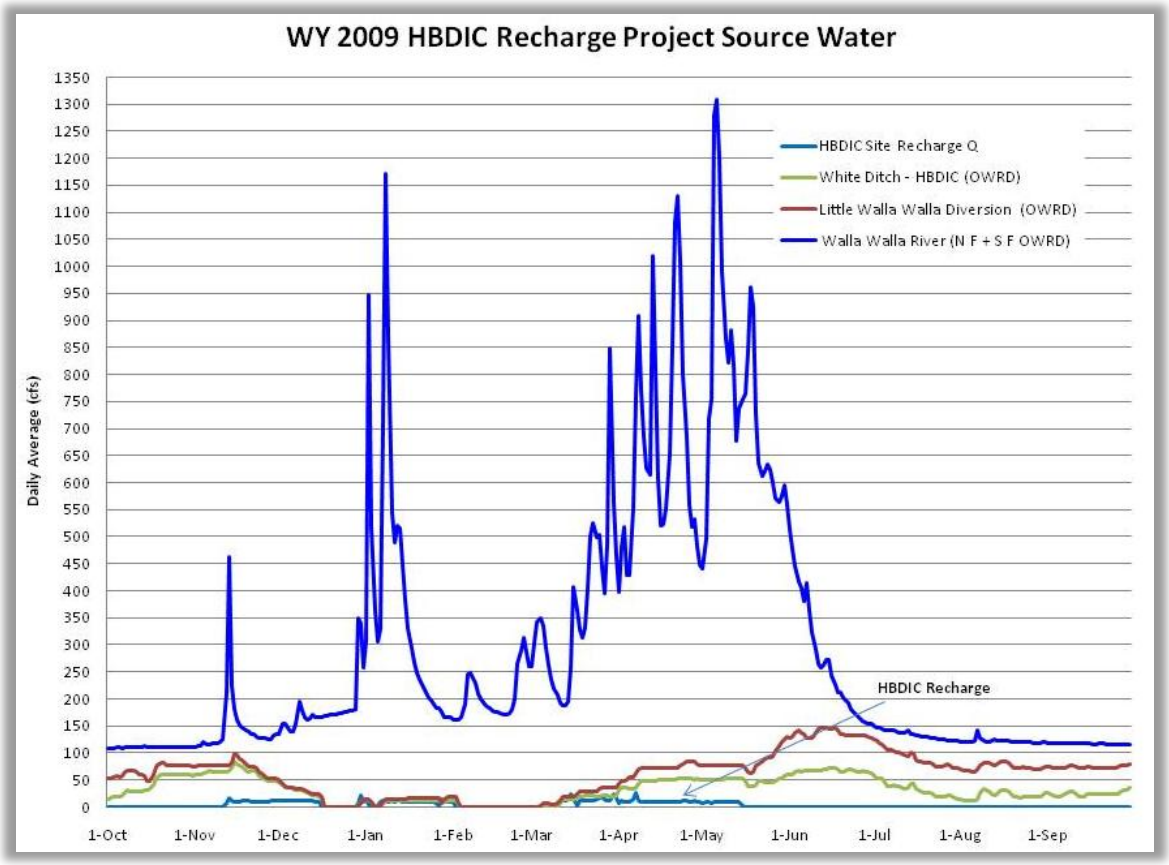


Figure 24. Comparison Walla Walla River source water to Diversions and Use (WY 2009).

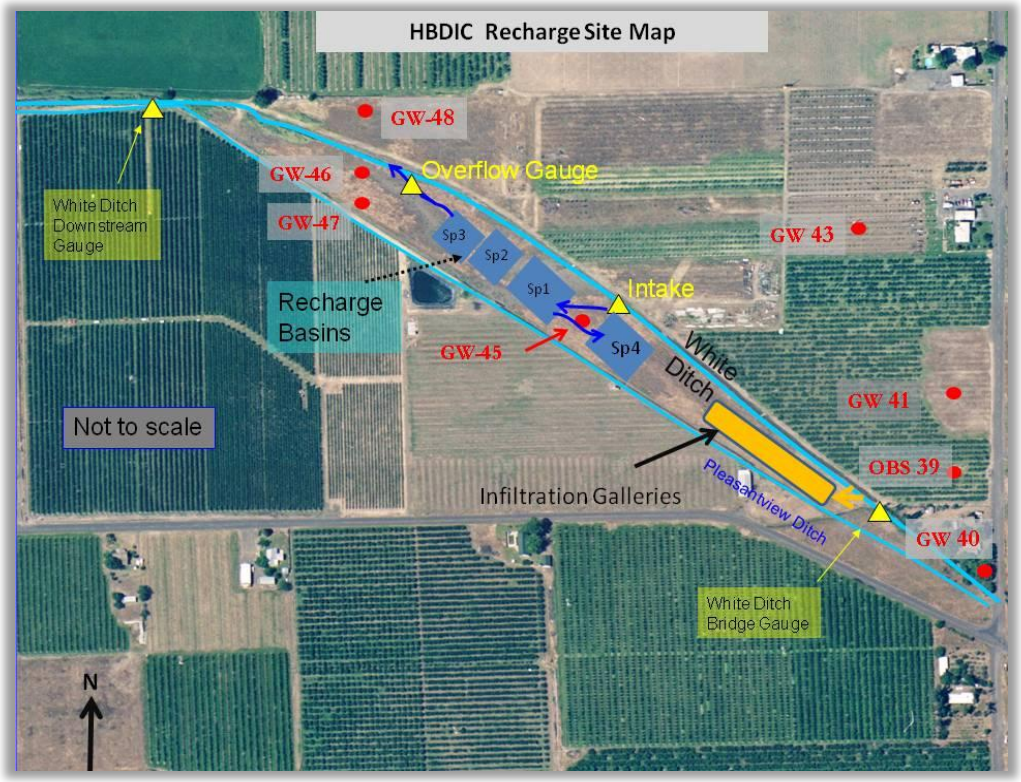


Figure 25. Aerial Map of HBDIC Recharge Site with Monitoring

Flow is measured into the project in the intake weir structure where an unvented *In-situ LT-100* level logger records water level in PSI. Atmospheric PSI data is also collected on site and at the WWBWC office to help correct for water levels in the weir. Using the engineered weir rating table, water level data is converted into 15-minute flow data and is compiled annually... Tail water leaving the site is measured in a portable ramp flume using the same equipment described above. Both the intake and overflow sites have physical staff gauges with which to check the electronic logger measurements against actual physical water levels. This provides calibration information for the logger data and ensures correction against drift and other recorder abnormalities. Data is plotted for a visual check by WWBWC hydrology staff and then used to calculate recharge rates and water usage at the site for testing and reporting purposes.

Spreading Basins Recharge Results

To calculate the total recharge volume and average recharge rate at the HBDIC site, instantaneous overflow data (cfs) is subtracted from the instantaneous intake data (cfs). The amount of water delivered to the Site in each season of operations has varied from a low of 409 acre-feet in 2004 to a high of 3234 acre-feet in 2006-2007 (Table 2). These amounts were calculated using stage data measured in the flume that delivers water into the Site. The stage data was measured using a digital data logger and pressure transducer programmed to measure depth of water through the flume hourly. Table 2 presents our calculated daily average recharge rate (in cfs) and total volume delivered (in acre-feet) for the site each recharge season, or portion of a recharge season. Table 2 also lists total

infiltration basin area which has changed over time as the site has been periodically expanded. Comparing the area of the basins to the volume delivered shows us that recharge efficiency at the Site has varied over time.

The delivery of water to the site is influenced by a number of factors that are independent of site operation. Inflow to the site is susceptible to water elevation conditions in the White Ditch where upstream users can turn off, suddenly increasing the amount of water entering the project, making the overflow channel a necessity and the inflow data vary greatly. Alternatively, up gradient water users diverting water can cause the project to run below it optimal recharge potential. During the winter operational months, periods of low water temperatures can influence the rate at which water can infiltrate; decreasing water temperature equates to increasing water viscosity. All of these physical issues influence effective recharge rates, which are manifest in the variability in average daily Q seen in **Figure** 26.

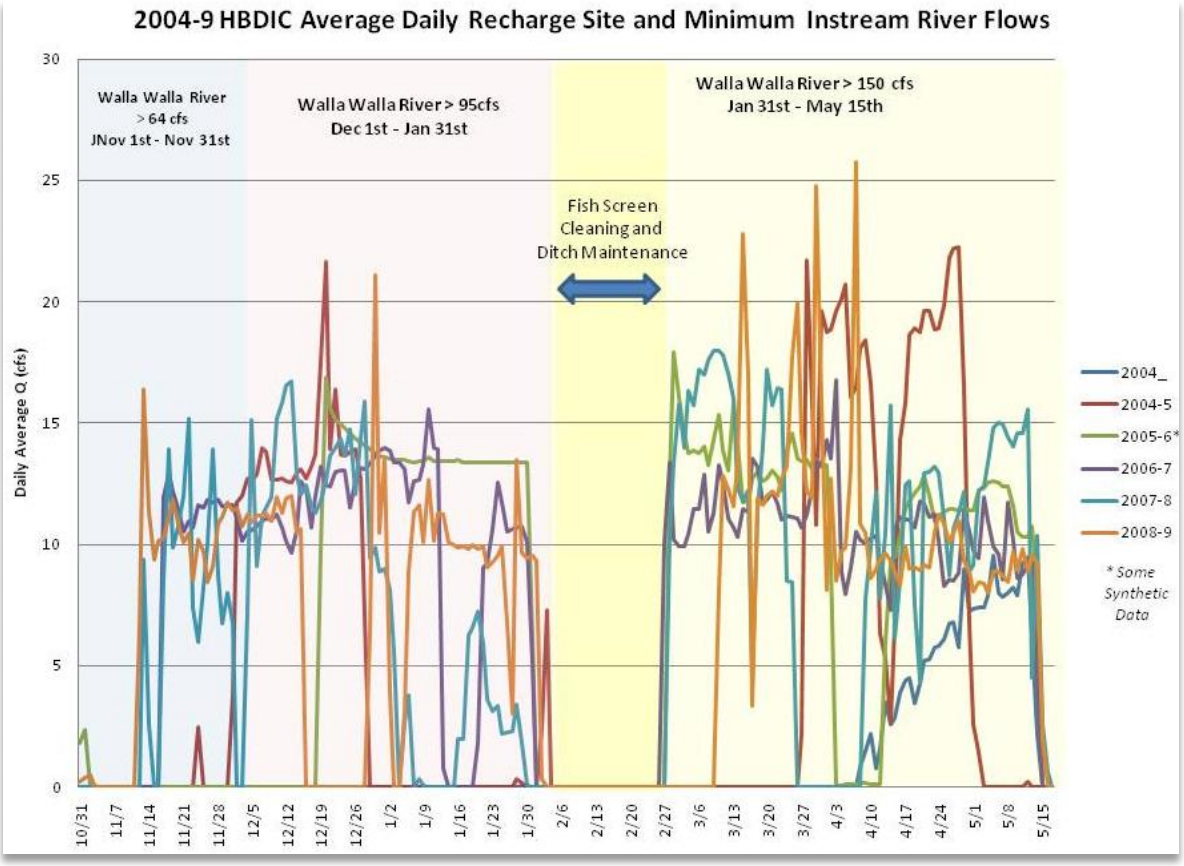


Figure 26. 2004-9 HBDIC Recharge Flows (daily average – cfs)

Reviewing the average daily flows, it generally appears that the period between November 1st through February 1st has a decreased recharge rate overall but is also less sporadic in the flow peaks than the February 21st through May 15th period. As shown above, the period starting on February 1st is the period for HBDIC and Little Walla Walla River system shutdown. This shutdown is due to two factors: 1) The fish screen structure located at the Little Walla Walla diversion needs to be cleaned every year in order to be effective and 2) the instream flow requirement for the HBDIC project goes from 95 cfs to 150 cfs on February 1st. This, coupled with the generally low flow seen in the river at this time due to cold temperature and headwaters snow packs, makes it a good time to service the fish ladders and turn off the system. Consequently both the WWRID and HBDIC irrigation districts now perform some of their ditch maintenance to correspond to this off period.

					Infiltration Area				
Recharge Seasons	Period of Operation	Days of Operation (actual)	Average Recharge Rate (cfs)	Site Expansion Phase	(feet^2)	(acres)	Basin Recharge Volume (acre-feet)	Basin Recharge Volume (Gallons x 1,000)	Total Basin Recharge (acre-feet)
Spring 2004	4/8/4 to 5/14/4	36.0	5.7	I	15,000	0.3	409	133,273	409 (2004)
2004-2005	12/1/4 to 2/3/5	28.7	13.2	I	15,000	0.3	388	126,398	1871 (2004-5)
2004-2005	3/27/5 to 4/30/5	35.7	15.8	II	47,420	1.1	650	211,803	
2005-2006	11/1/5 to 5/15/6	118.1	11.9	II	47,420	1.1	2,813	916,619	2813 (2005-6)
2006-2007	11/1/6 to 5/15/7	128.0	11.3	II	47,420	1.1	3,278	1,068,140	3234 (2006-7)
2007-2008	11/14/7 to 3/25/7	86.8	11.1	II	61,987	1.4	1,939	631,962	2739 (2007-8)
2007-2008	4/10/8 to 5/15/8	34.5	12.0	III	61,987	1.4	820	267,125	
2008-2009	11/1/8 to 5/15/9	134.5	10.7	III	61,987	1.4	2,840	925,417	2840 (2008-9)
	Total	602.3					13,137	4,280,736	

Table 2. 2004-9 HBDIC Spreading Basins Operations for Surface Flows

Clearly, actual water usage for the HBDIC site has been influenced by changes in foot-print and size. These included the "construct-as-you-run operations "of the spring 2004 season, to the HBDIC site upgrades during mid-recharge season (2004-5 and 2007-8). The periods and days of operations also varied depending on Walla Walla River flow conditions, water temperatures, and at times due to water users needs in the system. The site expansions were numbered I, II and III with the infiltration areas increasing from 0.3 acres (15,000 ft^2) to 1.4 acres (61,987 feet^2). The season for the highest total recharge rate was the second half of the 2004-5 season (15.8) cfs while the most effective year for total volume recharged was the 2006-7 season (3234 acre-feet). Over the six year period the site was operated for a total of 602 days for a total of 13,137 acre feet or over 4 billion gallons of water.

To better understand variations in recharge rates, volumes relative to changes in operation days and infiltration area were further calculated from the HBDIC site operations statistics (Table 3). With 194 potential operational days in a recharge season (as defined by the limited license) the 2006-7 year showed the highest number of operating days (144.1) and hours (3459). This was also the year having the highest *seasonal* average recharge rate (8.3 cfs) where average recharge is divided by the total number of potential recharge days. The 2004-5 recharge season showed the highest *operating* recharge rate (15 cfs) as well as the highest average deviation. The high average deviation suggests a higher

variability in the recharge rate. For the purposes of clarity, the term *effective average recharge rate* used throughout the rest of this document refers to the highest *operating recharge rate.*

HBDIC Recharge Results by Season

Aquifer Recharge Operations Statistics	2004	2004-5*	2005-6	2006-7	2007-8	2008-9
Recharge Season Potential (Days)	194	194	194	194	195	194
Recharge Operation (Days)	36.0	64.4	118.1	144.1	121.3	132.6
Recharge Operation (Hours)	867	1546	2835	3459	2910	3183
Seasonal Average Recharge Flow (cfs)	1.1	4.8	7.2	8.3	7.0	7.3
Operating Average Recharge Flow (cfs)	5.7	15.0	11.9	11.3	11.4	10.7
Operating Average Recharge Flow - Average Deviation (cfs)	2.3	4.1	2.5	1.4	3.5	2.3
Peak Recharge Flow Rate (cfs)	14.1	35.2	27.3	30.6	20.2	37.6

** Some Synthetic data*

HBDIC Recharge Seasons

	2004	2004-5	2005-6	2006-7	2007-8	2008-9
Average Flow Rate - Nov 1st through Jan 31st (Winter)	N/A	13.4	13.6	11.8	9.7	10.3
Average Deviation - Winter	N/A	1.5	0.8	1.3	3.9	2.0
Average Recharge Rate - Mar 1st through May 15th (Spring)	5.7	15.6	11.0	10.9	13.2	11.2
Average Deviation - Spring	2.3	5.1	3.1	1.5	2.6	2.8

Table 3. HBDIC Recharge Site Operational Statistics

Calculating the total *effective* recharge rate as well as the total recharge volumes for the HBDIC project also requires estimating the amount of water lost in conveyance in the White Ditch from Little Walla Walla Diversion to the site. This is required by the limited license. Various ditch loss studies have been conducted by the WWBWC, OSU and others with varied results and confidence levels. For the purposes of this report an estimated conveyance loss of 10 cfs was used to calculate the total values for the project. This value is based on the HBDIC manager's operational knowledge of this system (e.g. constantly supplying known volumes of water to his patrons) and is supported by reviewing the OWRD Gauge and HBDIC intake data during periods when only the HBDIC site is in operations. Like the spreading basins on site, this 10 cfs value likely varies with temperature, flow volumes and other factors.

To conclude, Table 4 shows that the total *effective* recharge rate for the site and ditch appears to average around 22 cfs with an average total volume of around 5,000 acre-feet (excluding the spring 2004 season). To provide perspective, 5,000 acre-feet is the equivalent of 7.8 miles^2 a foot-deep in water. The ~ 22 cfs *effective* recharge rate means that the spreading basins portion of the HBDIC site and the ditch supplying water to the site is currently utilizing 44% of its total allowed recharge rate from the Walla Walla River.

		Total Recharge Rates			Total Volumes		
Recharge Seasons	Days of Operation	Operating Average Recharge Rate (cfs)	Estimated Conveyance Recharge Rate (cfs)	Total Recharge Rate (cfs)	Total Basin Recharge (acre-feet)	Total Conveyance Recharge (acre-feet)	Total HBDIC Project (acre-feet)
Spring 2004	36	5.7	10.0	15.7	409.0	713.9	**1,122.9**
2004-2005	64.4	15.0	10.0	25.0	1,871.0	1,277.1	**3,148.1**
2005-2006	118.1	11.9	10.0	21.9	2,813.0	2,341.9	**5,154.9**
2006-2007	128.0	11.3	10.0	21.3	3,234.0	2,538.2	**5,772.2**
2007-2008	121.3	11.4	10.0	21.4	2,739.0	2,406.0	**5,145.0**
2008-2009	134.5	10.7	10.0	20.7	2,840.0	2,667.1	**5,507.1**
						Total Recharge	**25,850.2**

Table 4. Total Water Usage Values for the HBDIC Recharge Site (2004-9)

Deciphering the Variations in Recharge Volumes and Rates

As we review the water usage data provided in Tables 2 through 4 it becomes apparent that rates and volumes of recharge for the HBDIC site do not seem dependent solely on infiltration area or intake management. As discussed earlier there are many operational and physical factors that likely influence the effectiveness of the project to help replenish the shallow aquifer system. However there are other factors not mentioned in the previous section that also can influence the effectiveness of the spreading basins to replenish the shallow aquifer. For the purpose of this report we will review data relative to the following potential influences:

1. Seasonal Temperature Fluctuations
2. Seasonal and Long-term Infiltration Basin Clogging
3. Water Table Mounding

Seasonal Temperature Fluctuations

While the HBDIC-WWBWC team did not conduct an in-depth research project coupling the *effective* rates of recharge with the water and air temperatures at the site, it is a well established fact that water becomes more viscous with decreasing temperatures. This physical factor would have the effect of making it more difficult to recharge at maximum *effective* rates during the cooler portions of the recharge season typically from November 1st through February 28th. **Figure** 27 shows a basic comparison of average recharge rates for the first and second halves of each recharge season. While there does appear to be some variability in rates, it is not clear that temperature (e.g. first half (blue) dramatically influences the *overall effective* rate of recharge. A more in-depth site study where continuous water temperatures are measured against recharge rates would help to better define this potential operational consideration for the HBDIC site.

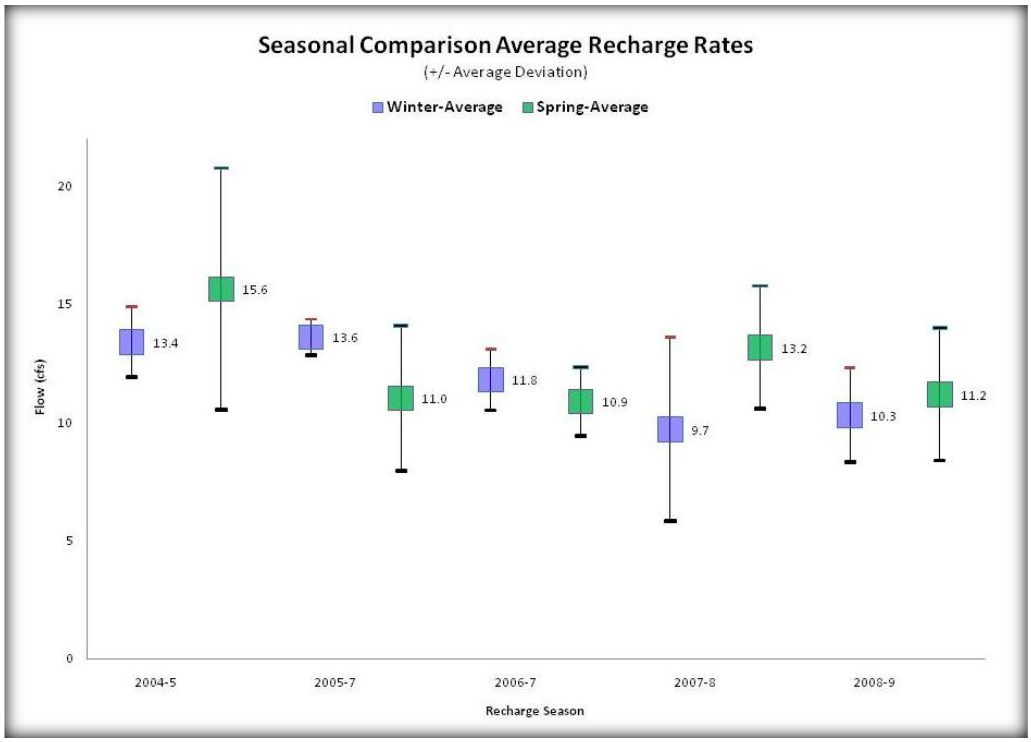


Figure 27. Comparison of fall vs. Winter *Effective Recharge Rates for Temperature*

Water Table Mounding and/or Basin Clogging

When we reviewed the overall rate information provided in Table 4 it became necessary to further partition the recharge rates and volumes based on infiltration areas. Therefore recharge rates were first grouped and graphed by infiltration areas (**Figure** 28). By doing this we could clearly see trends in the data. For the spring 2004 season and the first half of the 2004-5 seasons, rates varied a great deal. Some of this could likely be explained by the site construction operation limitations during the spring, but considering that the 13.4 cfs value in a 0.34 acre surface area is very high relative to the other seasons there may be other factors at work. Because this was the first portion of a season where all three original basins were operated it could be tied to the site being unclogged and ready for maximum infiltration. It should be noted that when engineering the design for the first 3' x 50' x 100' foot ponds, a small-pit slug test was performed. That test showed an infiltration rate in this much smaller area to be high enough that the 3 original basins should have taken 50 cfs. This indicates the size of the pond footprint and its interactions with the underlying water table (mounding) likely has an influence on recharge rates.

The three recharge ponds (2004-5 through 2007-8) have a combined infiltration area of 1.1 acres. It does appear that during this period that the recharge rate is declining particularly from the first data point to the second. This may also be due to the accumulation of sediment through the operation at the site. A similar decreasing recharge rate trend also appears to be seen after the Phase III expansion, where recharge rate dropped from 12.0 cfs to 10.7 cfs. This is a lower average recharge than when the site was 1.1 acres in total size. However, as mentioned earlier in this section the staff

operations of the intake relative to the white ditch, also may be playing a role influencing these values. Following this analysis, we weighted each of the recharge rates by total infiltration area (average recharge rate/infiltration area) and plotted the results in **Figure** 29. This helps to highlight that if surface area were the only thing to consider. It would appear that the benefits of increasing size to increase recharge rates likely plateaus somewhere between 0.34 acres and 1.1 acres, 38.3 cfs and 14.5 cfs respectfully. However the fact that infiltration rates do appear to drop when infiltration area is held constant indicates that surface area does not dictate infiltration rates alone.

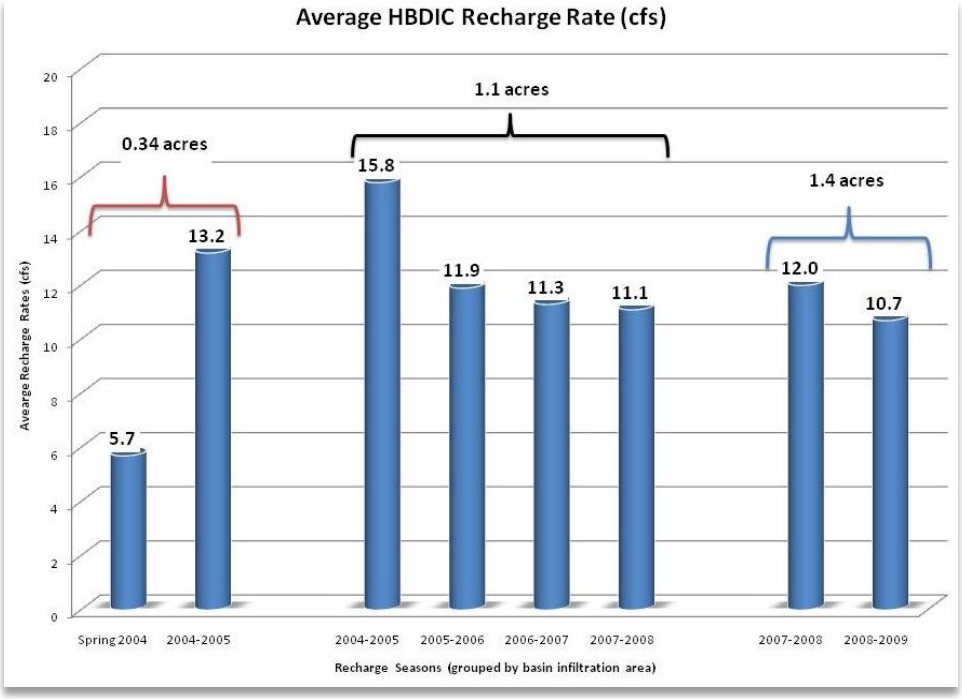


Figure 28. HBDIC *Effective* Recharge rates (cfs) – 2004-9

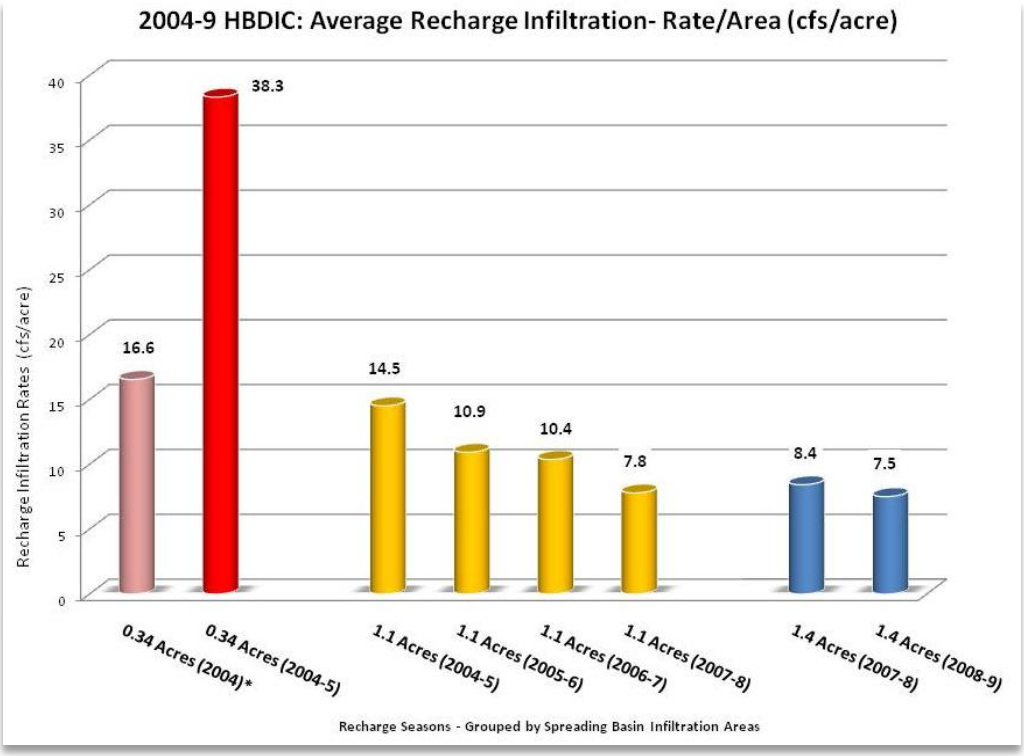


Figure 29. HBDIC Recharge Rates in Acre-feet/day

Mounding of the water table below the site could also be influencing these rates over time. The mounding below the recharge project happens due to the manner which water leaves the site and moves through the unsaturated (vadose zone) to the saturated (water table) subsurface zones. Water moving directly out of the bottom of the basin toward the water table moves quicker due to gravity and unsaturated conditions (**Figure** 30). Once that water mingles with the water table it slows down because then its only direction of movement is down gradient which is expressed by Darcy's law[17]; including permeability and pressure gradient (P) or more simply, slope of the unconfined water table. Because this rate of movement is slower than the vertical movement through the unsaturated zone, water tends to back up and "mound" upward toward the spreading basins. This water then begins to influence the rate at which water can infiltrate from the site. Relative to the data being presented here, this would likely manifest itself in reduced infiltration rates even with increased infiltration areas.

[17] In fluid dynamics and hydrology, Darcy's law is a phenomenologically derived constitutive equation that describes the flow of a fluid through a porous medium. Henry Darcy, *Les Fontaines Publiques de la Ville de Dijon* ("The Public Fountains of the Town of Dijon"), Dalmont, Paris (1856)

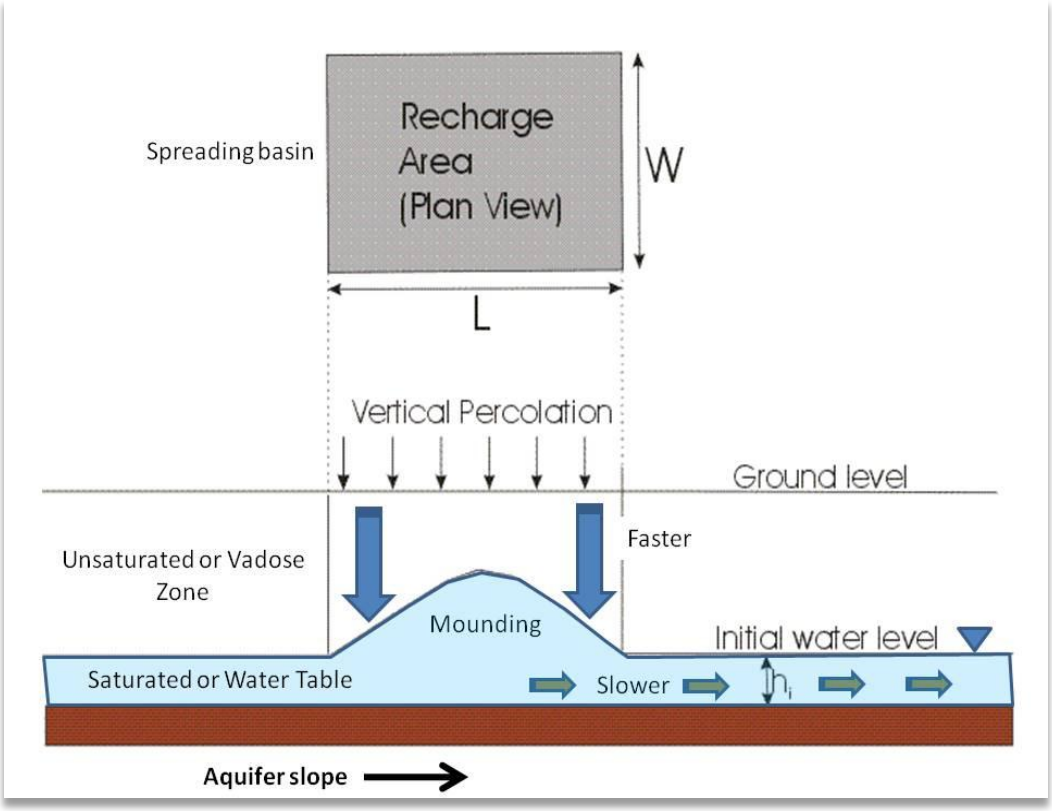


Figure 30. Conceptual Diagram of Aquifer Recharge Mounding and Saturated Groundwater Movement

Mounding could affect recharge rates over time if the HBDIC site was having the net effect of decreasing the distance between surface infiltration basins and the water table. In other words, if the HBDIC project through its six seasons of operations was having the net effect of localized aquifer recovery this could be expressed on the surface as decreasing *effective* recharge rates. **Figure** 31 shows one of the 4 on-site HBDIC monitoring wells (GW-45) and a seemingly increasing peak and trough recovery since recharge operations began. Due to localized aquifer pumping, the operations of the White Ditch and other potential up gradient influences on the water table, it is difficult to clearly use this graph to conclude a recovery. However, it does provide some insight into the possible reduction in overall average *effective* recharge rates at the site and as more years of operations occur, the trend may become even more conclusive.

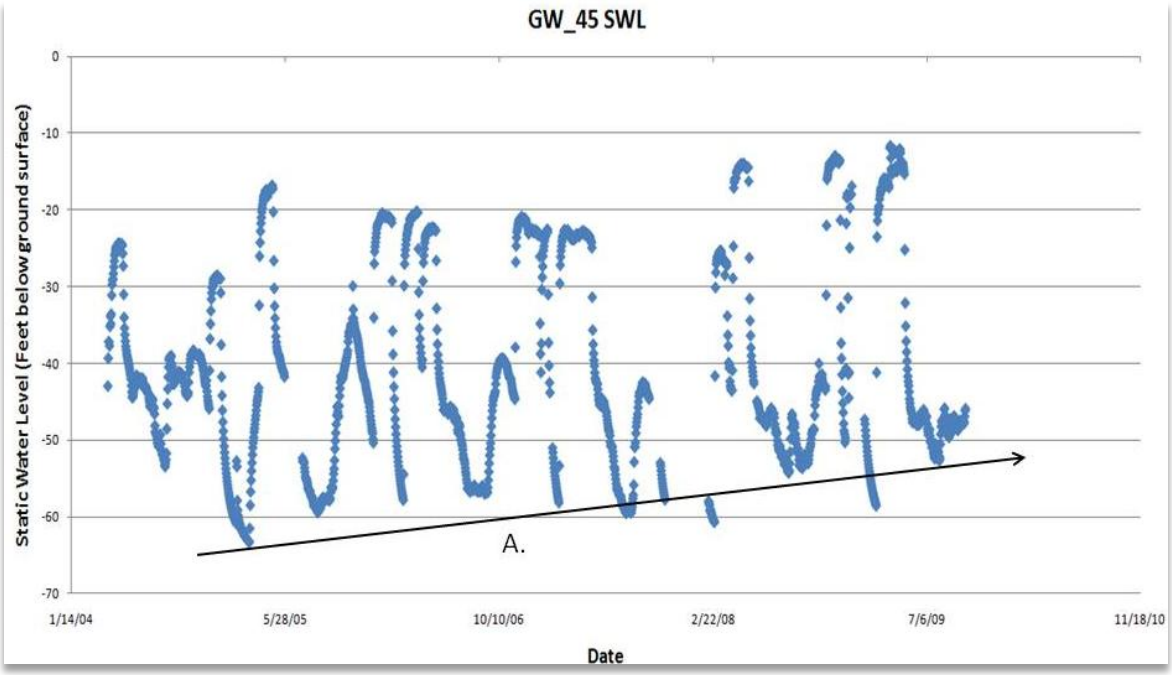


Figure 31. HBDIC On-site Observation Well Water Level Data (2004-9)

HBDIC Water Quality Monitoring Program and Procedures (2004-2009)

The HBDIC Recharge Project represented the first project to apply for a limited testing license for aquifer recharge in the State of Oregon. With this, a concise water-quality sampling plan was developed during the project. Monitoring and ensuring that water quality is adequate to operate an aquifer recharge project was and continues to be a top priority for the HBDIC-WWBWC project team. Starting in 2003 Phil Richardson at Oregon Department of Environmental Quality (Pendleton, Oregon) along with Thomas Darnell at Oregon State University Extension (Milton-Freewater, Oregon) worked with WWBWC staff to develop the water quality parameters and testing protocols for the HBDIC project. This was completed during the original Limited Testing License application process in 2003-4. For more information on how this site-specific water quality monitoring plan for aquifer recharge was compiled, details can be found in *Hudson Bay Aquifer Recharge Project: An application for ASR Testing Limited License to Oregon Water Resources Department (OWRD) (OAR 690-350-0020), and attachments* (Bower R. J., 2003).

Since the original conception of the water quality plan, there have been a variety of progressive changes to the original plan. Working with ODEQ, the HBDIC-WWBWC team has adaptively modified the water quality monitoring to prioritize the analytes based upon collected samples and subsequent results. This has allowed the project to move from a fairly high-intensity sampling plan to a reduced, but focused list of key parameters. In some cases the analytes that were of most interest (mainly due to historic or current basin use) were not available from the HBDIC site laboratory contractor. Cindy O'toole at Edge Analytical worked with the HBDIC-WWBWC team to create laboratory standards for those analytes. In 2006 the original EPA SOC list was downsized to focus on priority analytes. Some of

the new standards that ODEQ was most interested in were added. As of the 2009-10 seasons, the list discussed below is the current water-quality parameter list. To summarize the program and the results from the past water quality monitoring, it is best to separate sampling into two categories of constituents.

Baseline Chemistry:

- nitrate
- total kjeldahl nitrogen (TKN)
- total dissolved solids (TDS)
- chemical oxygen demand (COD)
- chloride
- orthophosphate
- fecal coliform bacteria

Soluble Organic Compounds – Pesticides

(Common/Trade names, EPA Drinking Water Method)

- 2,4 D acid, Dacamine, 515.1
- Dimethoate, Cygon, 525.2
- Metalaxyl, Ridomil, 525.2
- Napropamide, Devrinol, 525.2
- Simazine, Princep, Aquazine, 525.2
- 1-Naphthaleneacetamide, Amid-thin 525.2
- Diazinon, Diazinon, 525.2
- Fenarimol, Rubigan, 525.2
- Lindane, Lindane, 525.2
- Methidathinon, Supracide, 525.2
- Mevinphos, Phosdrin, 525.2
- Myclobutanil, Systhane, Rally 525.2
- Triflumizole, Procure, 525.2
- Azinphos-methyl, Guthion, 525.2
- Carbaryl, Sevin, 531.1
- Chlorpyrifos, Dursban, Lorsban, 525.2
- DDD (TDE) Rhotane, DDD, 525.2
- DDE degradation product, 525.2
- DDT Anofex, Gesarol, 525.2
- Dicofol , Kelthane, 525.2
- Malathion, Cythion, 525.2
- Methyl Parathion, Penncap, 525.2
- Phosmet, Imidan, 525.2
- Propargite, Omite, Comit, 525.2
- Triadimefon Dimethoate, Bayleton, 525.2

- Oxamyl, Vydate, 531.1
- Hexazinone DPX 3674, Pronone, and Velpar, 525.2
- Parathion-Ethyl, Niran, Phoskil (56), 525.2

The WWBWC has a ODEQ approved Quality Assurance and Quality Control plan that requires at least 10% repeatability on all water quality and temperature sampling. Therefore, for all of the sampling completed at the HBDIC site, additional samples are collected for QA/QC. Edge Analytical Laboratory Inc. a certified laboratory in Burlingame, Washington, performed the basic chemistry and soluble organic compound analysis under their laboratory QA/QC plan. Their results are shared along with 2004-9 sampling results in Appendix **I**. Fecal coliform and total coliform testing is done by the City of Walla Walla's Water and Waste Water Treatment facility in Walla Walla, Washington. They also have an internal QA/QC plan that controls the quality and repeatability of their procedures.

In the first several years of site operations Kuo Testing Laboratories staff collected water quality samples. WWBWC staff took over the field sampling effort in 2008. Source water samples are collected from the weir-channel on the intake structure, typically in the weir's small backwater eddy. Groundwater samples were originally collected using sterile eco-bailers from Observation Well #1 (GW-46). In 2006 the HBDIC-WWBWC team purchased a submersible pump specifically designed for evacuating several total volumes of the observation well before collecting the water quality sample. This was to ensure that samples represented ambient groundwater conditions and not those inside the well casing.

Upon collection, samples are immediately placed in ice filled coolers that are transported to either the City of Walla Walla's laboratory (fecal coliform samples) or a local over-night shipping company to be sent to Edge Analytical. Typically, the samples arrived at Edge Analytical in adequate time for them to be processed in the required holding time. Turnaround time for the results from either lab is dependent upon the parameter being analyzed. Fecal coliform and general chemistry are often fairly quickly completed, while SOC analyses typically takes the longest to process. All results are sent as paper and electronic copies to the HBDIC-WWBWC and the information is kept in our project database. In the event there is any detection that appears to be of concern, ODEQ staff in Pendleton is immediately notified via email and/or phone. Instructions on how to proceed are acted upon by HBDIC-WWBWC staff in a timely manner. More information on the annual sampling can be requested from the WWBWC staff through the website or by phone.

WWBWC staff also conducted additional water quality sampling for the infiltration gallery testing portion of the site. Samples are collected and analyzed for Total Suspended Solids (TSS) and Total Organic Carbon (TOC). These samples were collected to evaluate the rates of clogging that can influence the design and operations of these infiltration galleries.

2004-2009 HBDIC Recharge Water Quality Results

All of the original laboratory reports for HBDIC water quality sampling from 2004 through 2009 recharge seasons can be found in Appendix I of this document. Results include laboratory QA/QC, field

notes and other pertinent information on the collection of this information over the six recharge seasons. For the 2004-9 recharge seasons the baseline chemistry for both the source and groundwater sites is summarized in Table 4. All values appear to be well within the maximum contaminant levels (MCL) for the state of Oregon. Surface water samples typically have slightly higher Chloride, Phosphate (ortho), Total Dissolved Solids (TDS), Total Suspended Solids (TSS) and Total Organic Carbon (TOC). The recharged groundwater samples tend to have slightly higher Chemical Oxygen Demand (COD) and TKN as Nitrogen; with Nitrates being about the same for both surface and groundwater samples.

Water Sample Sites: Ground/Surface	Analyte	Samples (n)	Minimum	Maximum	Average	Units
Groundwater	Chloride	16	ND	0.8	0.3	mg/L
Groundwater	Chemical Oxygen Demand	18	ND	55	12.9	mg/L
Groundwater	Nitrate as Nitrogen	13	0.1	0.6	0.2	mg/L
Groundwater	Orthophosphate as P	14	ND	0.5	0.2	mg/L
Groundwater	TKN as Nitrogen	15	ND	1.6	0.2	mg/L
Groundwater	Total Dissolved Solids	15	ND	84	48.7	mg/L
Groundwater	Total Suspended Solids	3	ND	ND	ND	mg/L
Groundwater	Total Organic Carbon	3	0.9	1.2	1.1	mg/L
Surface	Chloride	8	ND	1	0.8	mg/L
Surface	Chemical Oxygen Demand	7	ND	21	ND	mg/L
Surface	Nitrate as Nitrogen	5	ND	0.5	0.2	mg/L
Surface	Orthophosphate as P	4	0.1	0.6	0.3	mg/L
Surface	TKN as Nitrogen	7	ND	ND	ND	mg/L
Surface	Total Dissolved Solids	7	ND	76	57.4	mg/L
Surface	Total Suspended Solids	1	N/A	8	N/A	mg/L
Surface	Total Organic Carbon	1	N/A	8	N/A	mg/L

ND - No Detection

Table 4. Summary of Baseline Chemistry Sampling Results (2004-9)

During the 2004-9 sampling period there were only two Soluble Organic Compounds (SOC) detections at the HBDIC recharge site... Di (ethylhexyl)-phthalate was detected in observation well #1 at 2.2 ug/L on April 13, 2004. The 2004 EPA Maximum Contaminant Level (MCL) value for this compound is 6.0 ug/L. HBDIC-WWBWC monitoring staff working with ODEQ concluded that this was possibly a low-level detection arising from the newly installed PVC observation-well casing or possibly the well

sampling equipment. The substance was never detected again at the site; however the HBDIC WQ monitoring strategy continues to include this analyte in the sampling routine. The only other detection was 3.2 ug/L of Bisphenol-A at HBDIC Observation well #1 on May 27, 2009. Bisphenol-A is not listed by EPA as having a MCL value but has recently been in the national media associated with concerns over the chemicals widespread use in water bottles and other plastic containers. The HBDIC-WWBWC team continues to monitor for this analyte but are unclear as to its source, whether from the site or in the laboratory equipment.

Table 5 provides a statistical summary of the results of the fecal coliform analyses taken at both the surface and groundwater sites from 2004-9. Surface water samples averaged between 0 to 39 MPN/100 ml from 2004-9 while groundwater showed much lower averages of 0.8 to 3.8 MPN/100 ml. During the first two recharge seasons additional fecal coliform and total coliform samples were collected in order to clarify the extent to which the HBDIC sample results were controlled by ambient conditions. Those results and discussion were shared in the 2004 (Bower R. , 2004) and 2004-5 (Bower R. , 2005) reports which can be found by contacting the WWBWC. In summary, due to the widely distributed extent of low level fecal contamination, it was determined that the detected fecal coliform was considered an ambient background condition; and was not a result of HBDIC recharge site operations.

	Surface			Groundwater			
Sampling Year	Minimum	Maximum	Average	Minimum	Maximum	Average	Units
2004	1	130	39.8	0	14.8	3.8	MPN/100 ML
2004-5	0	62	9.4	0	12	2	MPN/100 ML
2005-6	14	20	17	0	3	1	MPN/100 ML
2006-7	7	23	15.3	0	3	1	MPN/100 ML
2007-8	11	14	12.5	0	1	0.5	MPN/100 ML
2008-9	N/A	19	N/A	0	2	0.8	MPN/100 ML

Table 5. 2004-9 Fecal Coliform Bacteria Sampling Statistical Summary of Results

Indicators of Soil-aquifer Treatment (SAT) at the HBDIC Recharge Site

Through the work of Dr. Herman Bouwer and others in the field of infiltration-basin aquifer recharge, the concept of natural attenuation of source water entering the groundwater through unsaturated soil has been formulated. Bouwer summarized the surface to subsurface process as:

"Where soil and groundwater conditions are favorable for artificial recharge of groundwater through infiltration basins, a high degree of upgrading can be achieved by allowing partially-treated sewage effluent to infiltrate into the soil and move down to the groundwater. The unsaturated or "vadose" zone then acts as a natural filter and can remove essentially all suspended solids, biodegradable materials, bacteria, viruses, and other microorganisms. Significant reductions in nitrogen, phosphorus, and heavy metals concentrations can also be achieved." (Bouwer, 1987)

While the source water entering the HBDIC site is not “sewage effluent” the process of bacteria and other pollutants being stripped from the water as it moves through the unsaturated zone is worthy of further review. When reviewing the data collected at the HBDIC recharge site, the parameter that is most likely to benefit from this process is ambient (but prevalent) fecal coliform contamination. During the initial start-up sampling of each recharge season, source and recharged water samples were collected. The results, when compared statistically, seem to indicate that natural attenuation is occurring at the site. **Figures** 32 and 33 show an order of magnitude lower fecal coliform concentration (average 2.7 MPN/100 ml) in the recharged groundwater than in the recharge source water (28.3 MPN/100 ml).

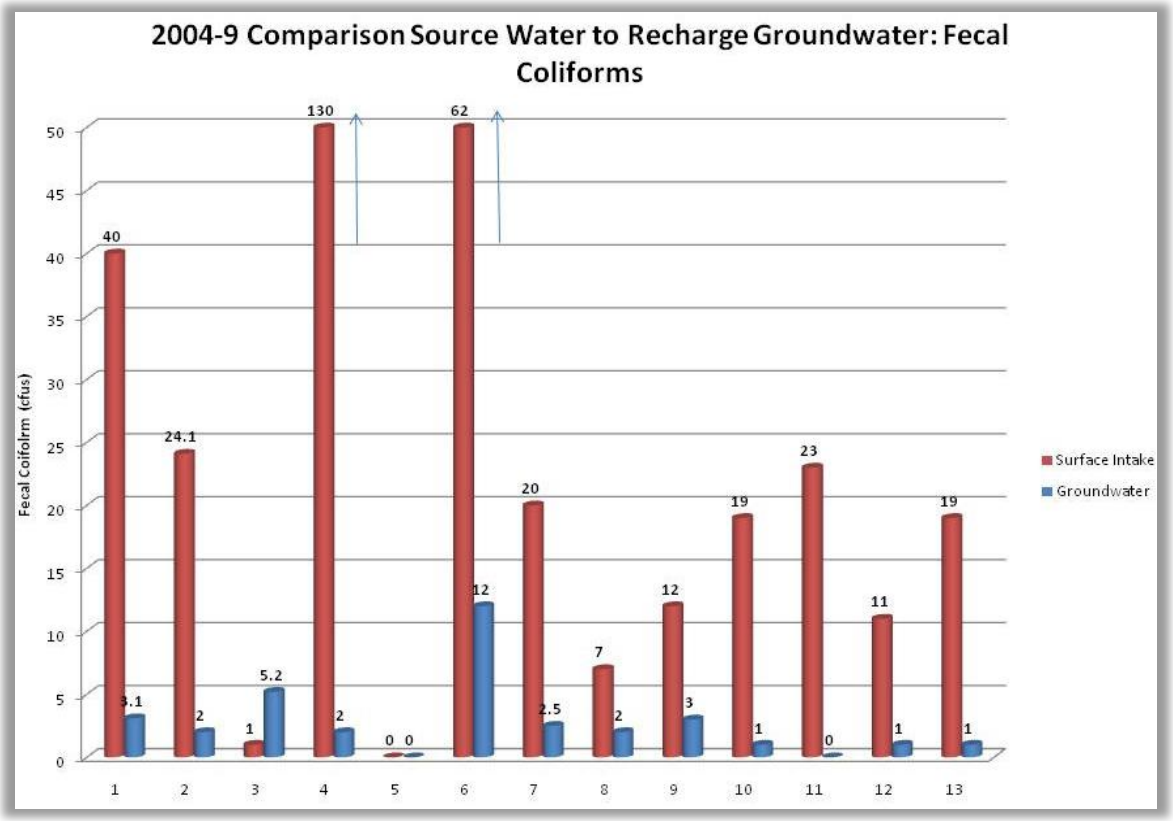


Figure 32. Surface versus Groundwater Fecal Coliform Results (2004-9)

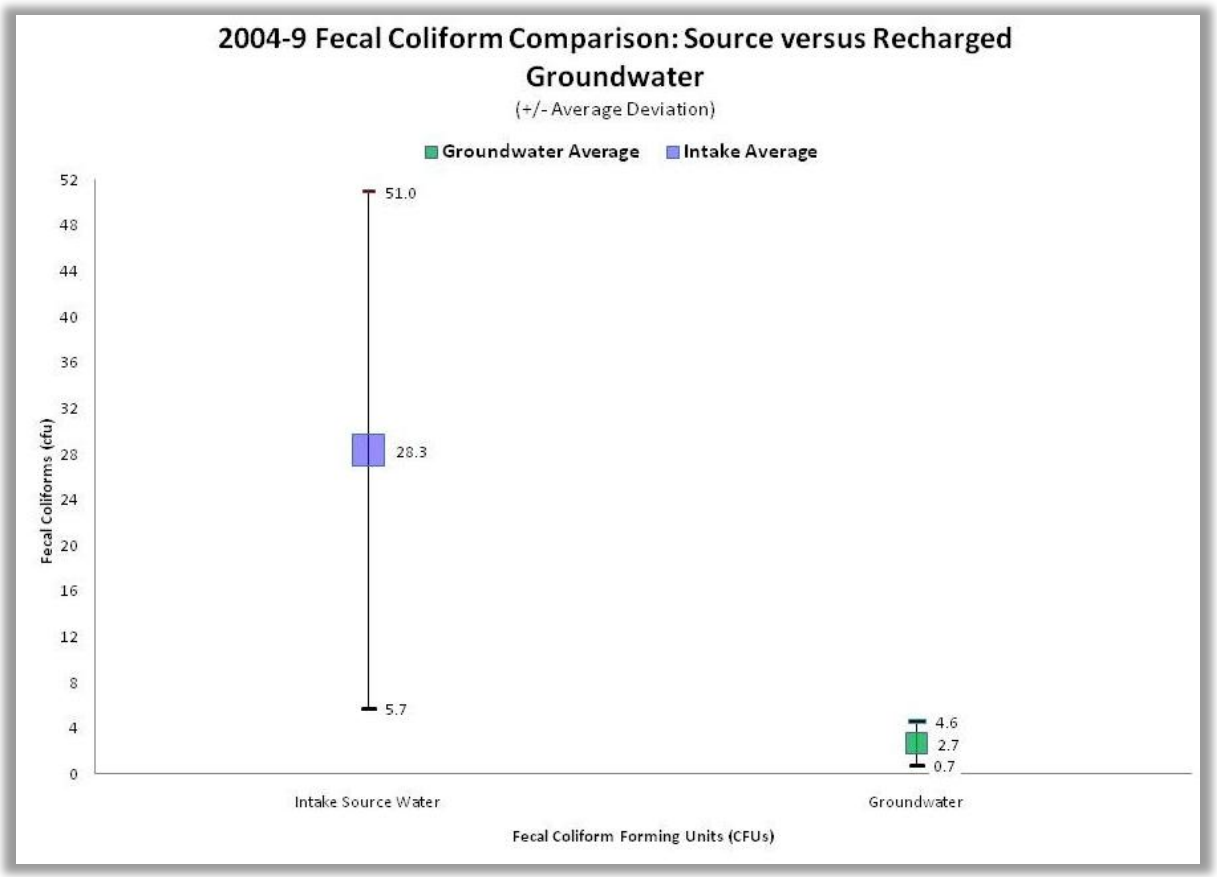


Figure 33. Comparison of Source vs. Groundwater fecal coliform statistics (2004-9)

Enteric bacteria like fecal coliform arise from the intestines of animals and are an indicator of more harmful pathogens in our water supplies. They have a limited range of temperature at which they can survive, usually corresponding to their host organism's body temperature (e.g. humans 37^0 C). While more sampling would be required to determine a more statistically robust conclusion, this does seem to correspond to literature supporting the process of source water quality improving through natural attenuation during aquifer recharge. This may help water quality regulators in the permitting future aquifer recharge projects.

Aquifer Response to Recharge

The purpose of aquifer recharge for the Walla Walla basin is to help stabilize and recover the shallow aquifer's groundwater storage supplies. Increased groundwater storage means historic springs that have experienced diminished flow could recover and flow again to the Walla Walla River- providing enhanced flow and off-channel habitat for recovering salmonids. In addition, increased groundwater storage would result in increased potential returns from the shallow aquifer to the Walla Walla River, helping to support and protect base flow - particularly during the low-flow months. Monitoring an

aquifer recharge project, in order to document its contributions toward this overall aquifer recovery purpose, can be broken down into two main scientific questions:

1. Did the aquifer respond to aquifer recharge operations?
2. Did the springs respond to changes in aquifer conditions from recharge operations?

This section focuses on tracking the process of aquifer recharge from the site out through the groundwater system; then intends to document the connection between those responses seen in the groundwater to those expressed in the springs. As the shallow aquifer system is large and complex, the focus of this section is limited to an area where recharge response is visually and graphically apparent. To demonstrate the overall benefits to aquifer storage, system wide recovery of springs and contributions to the Walla Walla River, the HBDIC-WWBWC team is relying on the IWFM modeling work[18] that Oregon State University will complete in mid-2010. Since the HBDIC likely represents only a small portion of the recharge 'need' in the alluvial aquifer system, it is not intended to show complete recovery of the aquifer. Understanding how much recharge and where to place it for maximum benefit, will be based on the scenarios generated by the IWFM model as well through the WWBWC's Bi-state Aquifer Storage and Spring Restoration program (ARSRP)[19].

Site-Specific Groundwater Response

In order to track the aquifer response to HBDIC recharge operations, responses in on-site monitoring wells were reviewed. **Figure**s 34 and 35 illustrate the response of the four on-site monitoring wells (GW-45, GW-46, GW-47, and GW-48) to recharge operations during the 2008-2009 recharge seasons. These hydrographs are very typical of what was observed in previous recharge seasons.

[18] IWFM modeling project funded by WDOE and OWEB in collaboration with the WMI Monitoring Program. Contact the WWBWC for more information.

[19] ARSRP is a bi-state recovery strategy that was the logical outcome from the aquifer recharge and WMI monitoring program lead by the WWBWC. For more information contact the WWBWC.

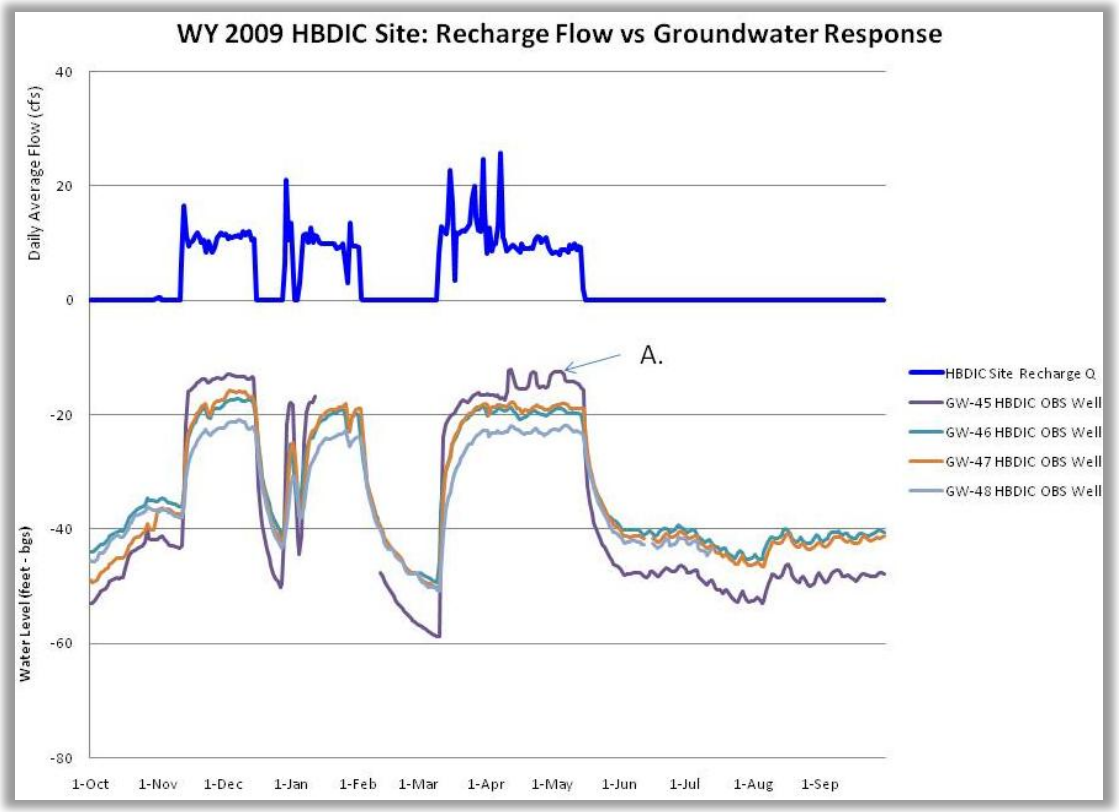


Figure 34. On-site Surface to Groundwater Response to Recharge Operations (2009)

Figure 34 shows the recharge flow rate (cfs) into the basins and the groundwater response to the recharge at the four on-site monitoring wells. It is clear that operations of the HBDIC recharge site have a direct mounding effect on the local water table. The staggered nature of the water levels in each of the wells is due to both their proximity to the mounding and their placement relative to the direction of groundwater flow. GW-45 now resides between the infiltration gallery and the down gradient spreading basins, which explain its higher overall water level. Also GW-45 shows the groundwater response (A.) to the 2008-9 infiltration galleries testing, which was done in 1-2 week blocks of operations.

Figure 35 shows GW-45 has the greatest response to operations. The up gradient well GW-40, which is ~10-15 feet from the White Ditch, also shows the influences of canal infiltration on the water table.

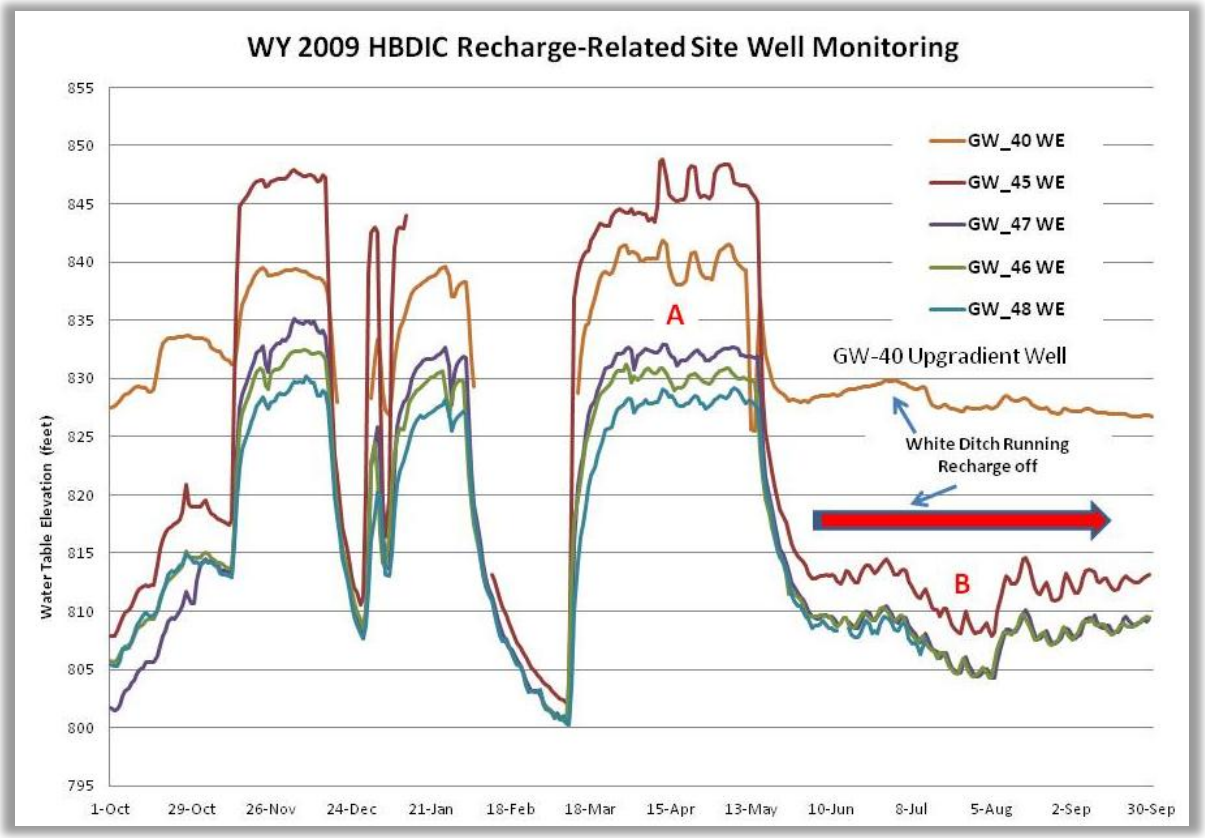


Figure 35. HBDIC Site Monitoring Wells and Various Sources of Recharge

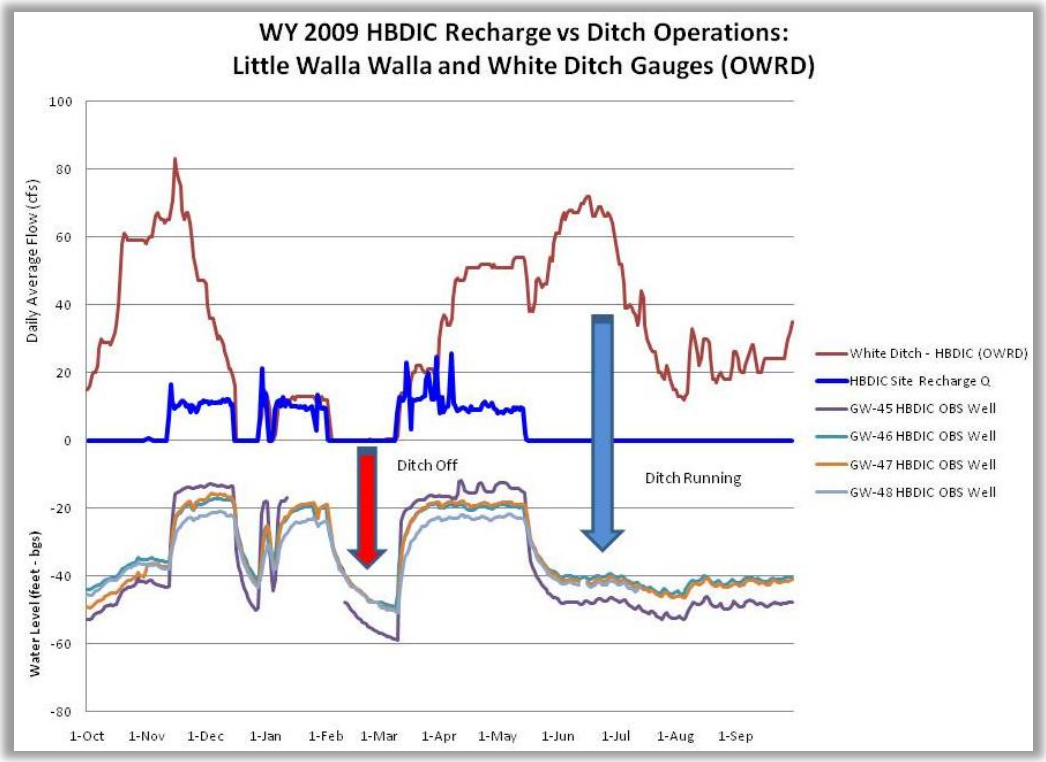


Figure 36. Comparison of White ditch and HBDIC recharge site operations to Groundwater Response

After the HBDIC recharge operations are turned off (May 15th), the HBDIC White Ditch continues operating into the late spring and early summer. In 2009 the system ran for the entire irrigation season due to an exceptional snow pack; however this is not typical of most years. **Figure** 36 illustrates the groundwater response to operation of the White Ditch (OWRD Gauge #) and HBDIC recharge site. When the White Ditch operation ceases the aquifer responds with declines in water level. Subsequently when the ditch is operating and HBDIC recharge is not occurring, the aquifer rises, to a higher level, which does appear to stabilize; suggesting an equilibrium between seepage and water level is reached. The data indicates that canals and ditch systems provide recharge water that if piped, will need to be replaced in order to achieve the purpose of aquifer stabilization and recovery.

Next, we shift our analysis to determine if there are any visible signs of water table recovery over the first 6 seasons of operations. **Figure**s 37 and 38, respectively, show groundwater levels (2004-9) during low flow periods and peak recharge periods. During the low-flow period (June 1st through September 30th) the recharge site is not operating but the White Ditch and surrounding groundwater pumping are underway. WY 2005 was a drought year during which surface water irrigation was drastically reduced due to lower than average Walla Walla River flows and additional groundwater pumping was done by many water users. Contrasting WY2005 to WY2009 (when strong Walla Walla River flow allowed HBDIC to operate the White Ditch for the entire summer) groundwater levels remained high. Conclusively determining groundwater recovery is difficult in this highly interconnected and volatile aquifer system, due to season by season changes in surface and groundwater conditions.

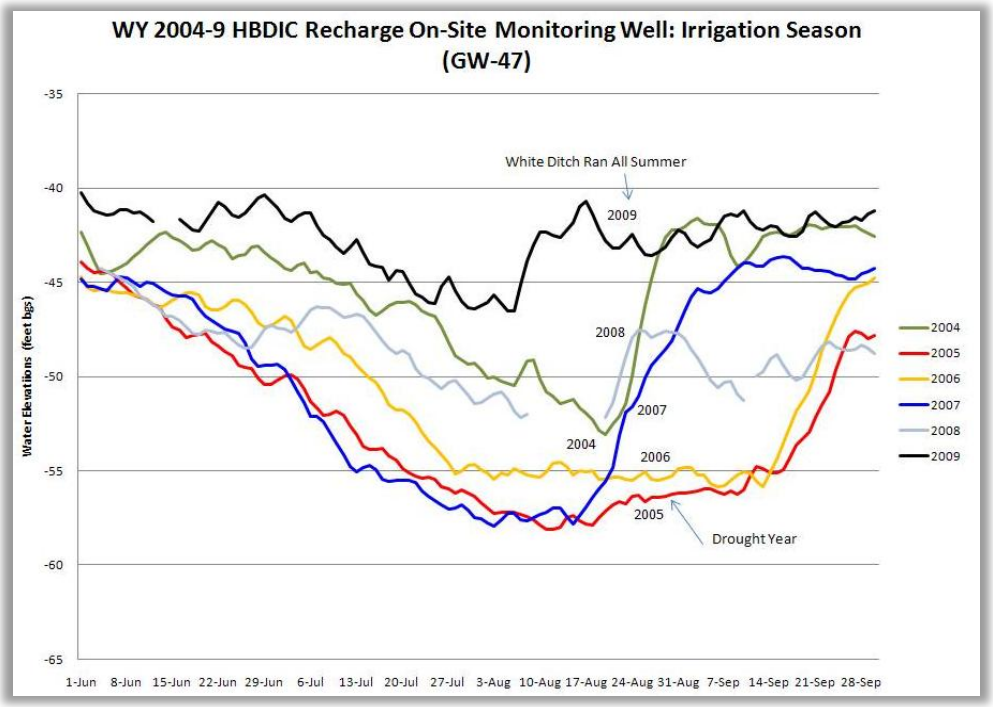


Figure 37. HBDIC Site Observation wells Irrigation Season water levels (2004-9)

Shifting the focus to the water table peak elevations when the HBDIC Recharge site is operating may indicate a general trend toward higher water table elevations at the site. While this could be tied to recovery of the localized water table it is also likely linked to the expanding infiltration area getting closer to the GW-45 well head. It appears there may be some correlation between rates of *effective* recharge and the height of the mounding at the site. Also it appears that the closer the infiltration area gets to this well higher water levels are observed. Further, investigations using this well and the horizontal distance to infiltration water may provide insights into actual depth to water mounding at the HBDIC site.

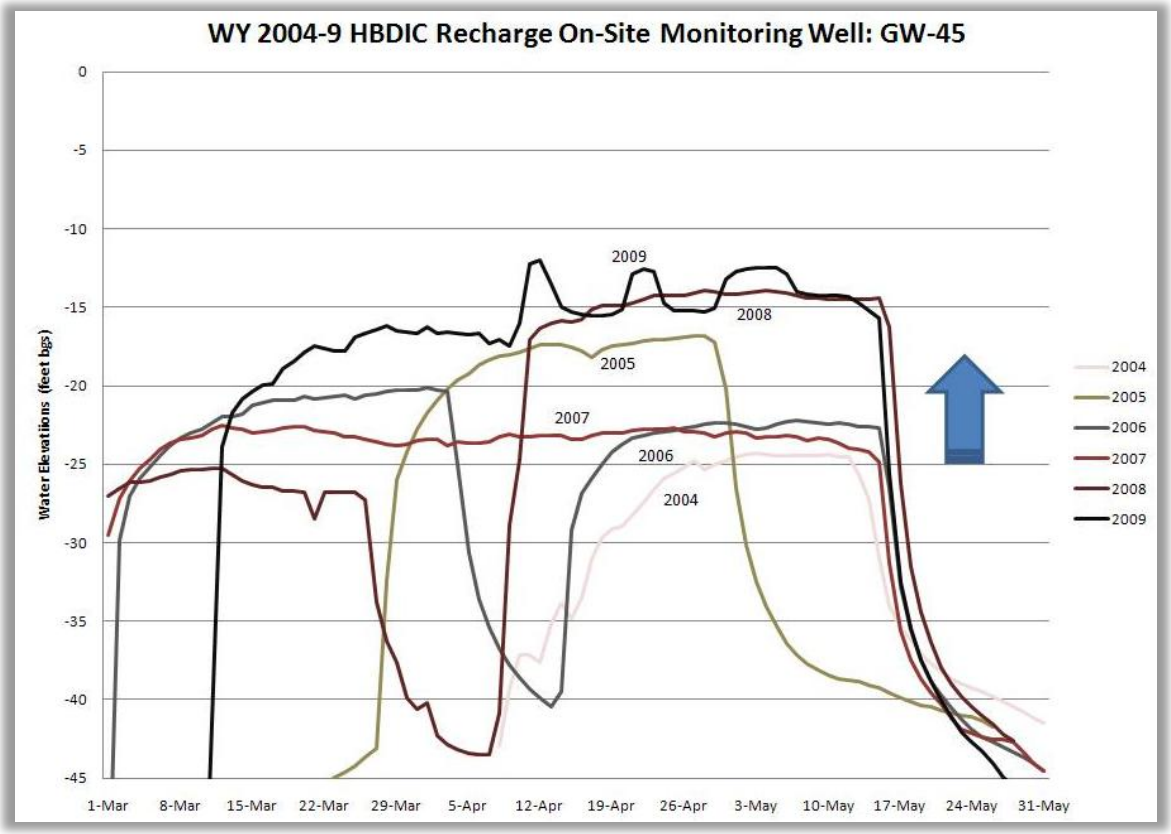


Figure 38. Water Table Response to HBDIC Recharge Operations: May 1st- May 31st

System Wide Groundwater Response to Spreading Basin Operations

Starting in 2001 the WWBWC working with its partners at OWRD, WDOE and OWEB began to put together a bi-state well monitoring system through state and federal grant funding. The purpose of this system is to better document overall shallow alluvial groundwater conditions as well as monitor subsurface responses to water management activities such as aquifer recharge and ditch piping. When the program started there were approximately 11 OWRD observation wells in Oregon and 1 WDOE well in the Washington portion of the Walla Walla River Valley. As of 2010, there are over 110 wells in the WWBWC's Bi-state well monitoring system that include dedicated (**Figure** 39) and existing wells that are either instrumented for continuous data or measured quarterly for static water levels (Bower R. , 2009; Patten S. , 2009). **Figure** 40 shows the extent of the monitoring system and their placement relative to the alluvial aquifer system in the Walla Walla River Valley.

Figure 39. WDOE Funded Dedicated Observation Well at Pepper Bridge Vineyards Road Grange Hall (Washington)

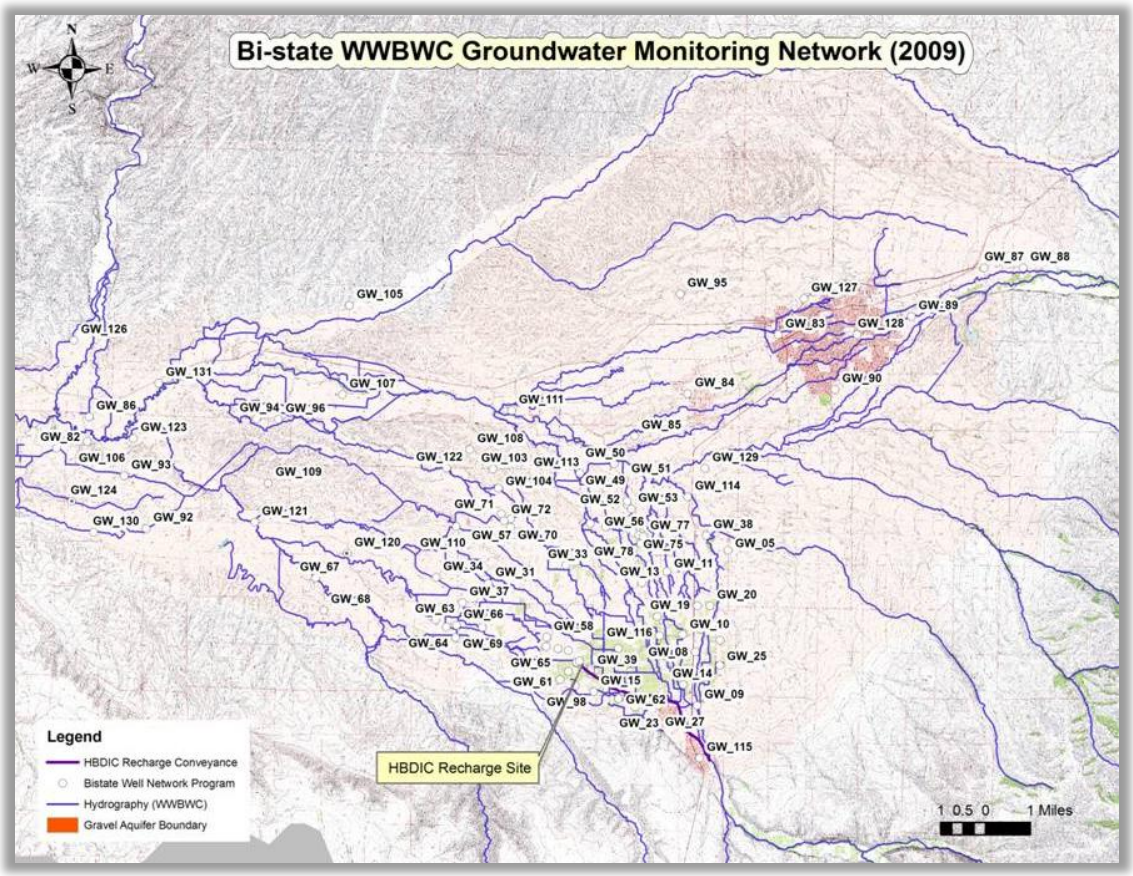


Figure 40. Map depicting WWBWC's Bi-state Well Monitoring System of the Walla Walla River valley Shallow Aquifer System

In the area interpreted to be down gradient of the Site water level data was examined to evaluate aquifer response, if any, to site recharge operations. By looking in the Johnson Creek area, we can focus on an area where recharge mounding more distally from the site should be seen in the water table response. To do this, several transects were selected. Moving up gradient from the HBDIC site, transect A on **Figure** 41 starts at the HBDIC up gradient control well GW-14 which shows no visible signs of HBDIC recharge activities. This well is directly underneath irrigated orchards near the Walla Walla River. Influences from irrigation are suggested by water level recovery during spring and summer irrigation activities. Additionally, GW-14 may show signs of decreasing groundwater levels in the Little Walla Walla River area (**Figure** 42). Transect A parallels the White Ditch that delivers the source water from the Walla Walla River to the HBDIC Recharge Site. The elevation difference along Transect A is from 910 (GW-14) to 817 feet (GW-40).

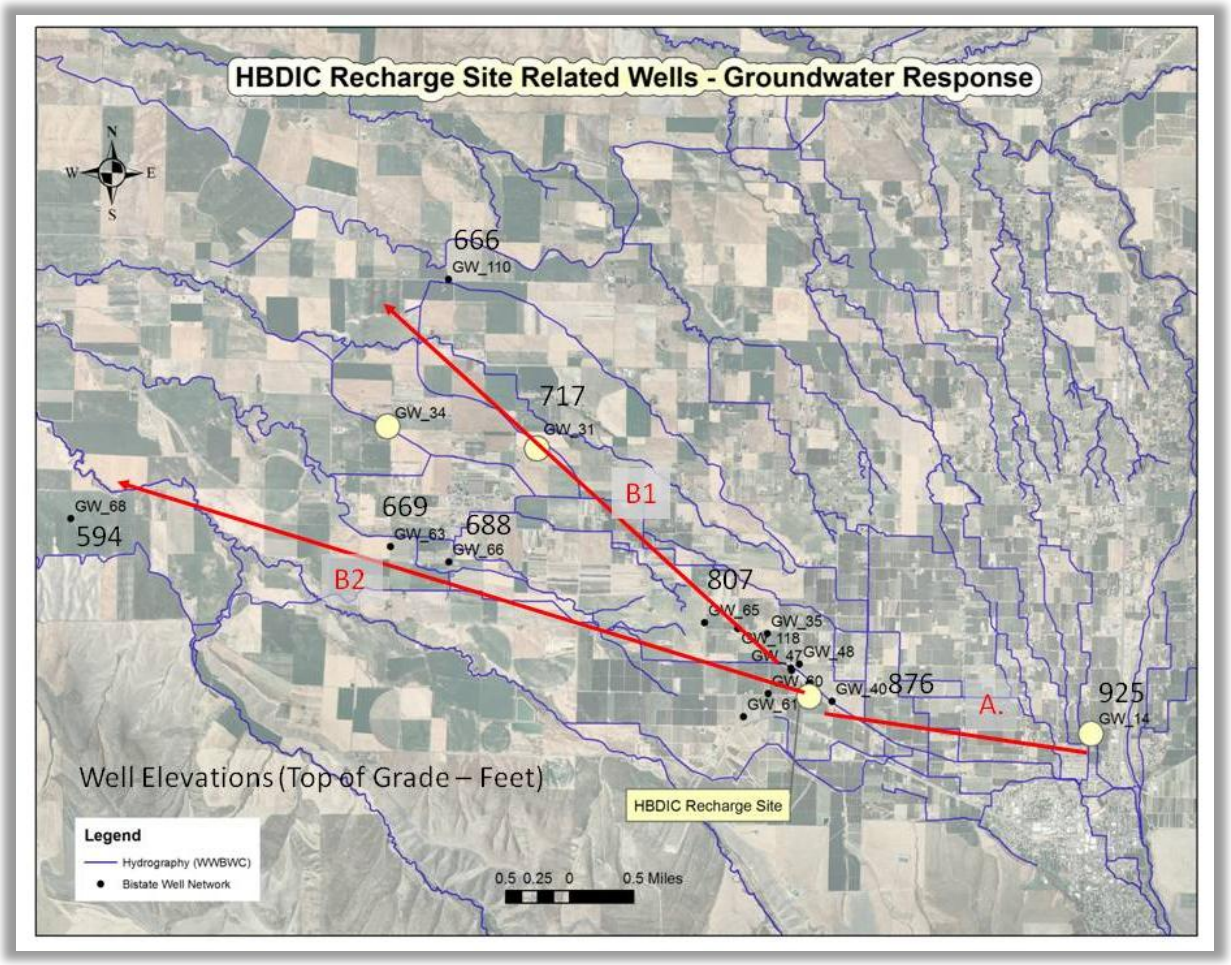


Figure 41. WWBWC Monitoring Wells and Transects Relative Recharge System Response

Moving down gradient from the HBDIC recharge project and GW-45 (**Figure** 41) two transects were selected in which to track groundwater response. An earlier 2005 HBDIC Recharge Site Monitoring

report (Bower R. , 2005) documented the pressure wave from HBDIC recharge activities in wells in the Johnson and Dugger Spring-Creeks areas. Transect B1 generally follows the monitoring wells paralleling the Johnson Spring-Creek with transect B2 paralleling the Dugger Spring-Creek system. Monitoring wells GW-31 (**Figure** 43) and GW-34 (**Figure** 44) in the Johnson Creek sub-basin show indications of possible groundwater recovery albeit with the incomplete continuous dataset sets, it makes it more difficult to be conclusive. Note the arrow lines provided on each graph are for trend-visualization only and are not linear regressions of the data. This is an area where extensive piping has occurred in recent years (e.g. HBDIC's Richartz Ditch-to-Pipeline conversion) which would seem counter intuitive to what appears to be gradual groundwater recovery. Coupling these results with those of increasing water table levels at the HBDIC recharge site will be something to continue to monitor as the project progresses.

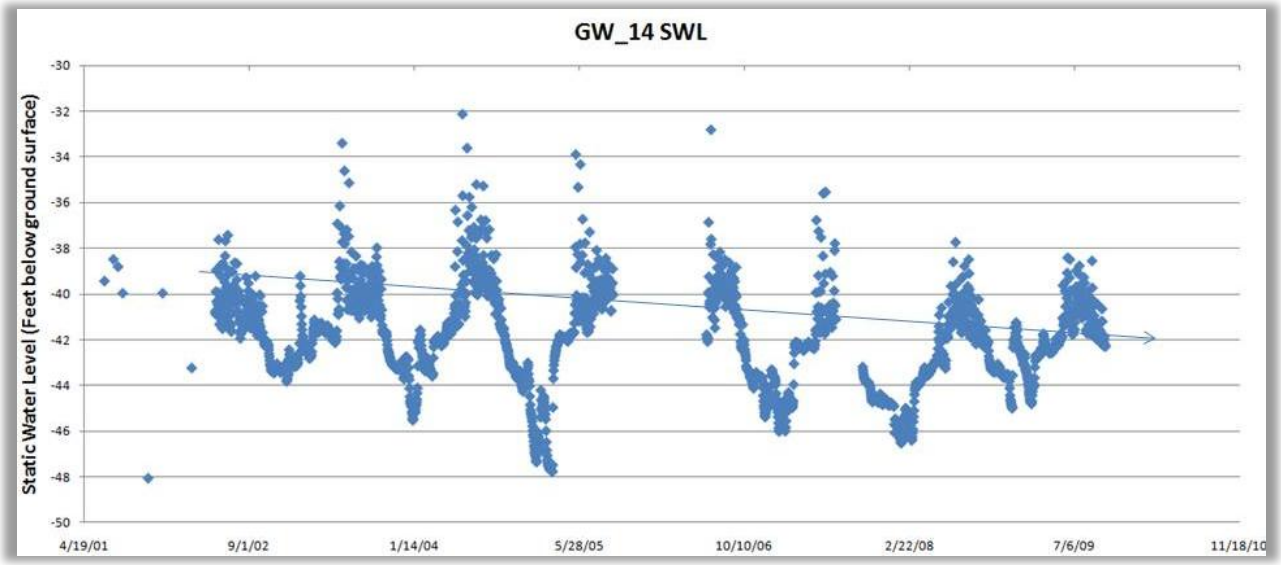


Figure 42. WWBWC Dedicated Monitoring Well used as up gradient Control for HBDIC Recharge Groundwater Response (2001-9)

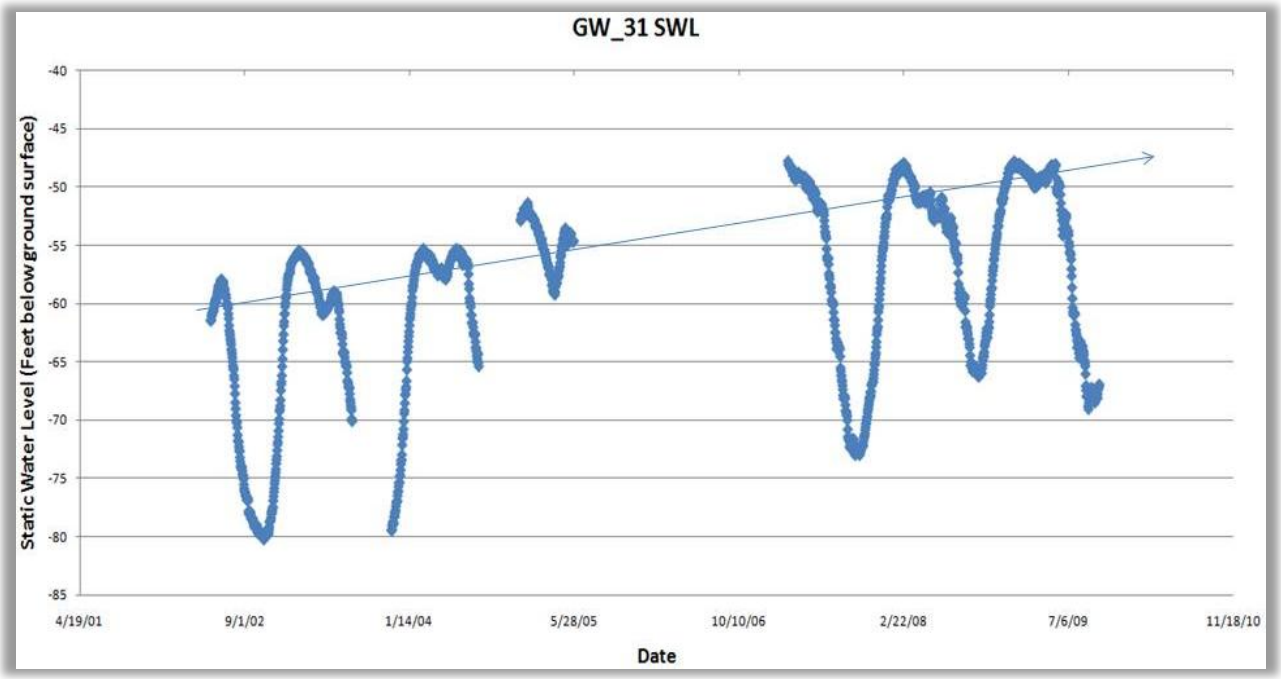


Figure 43. Water Levels at WWBWC Monitoring Well GW-31 (2002-9)

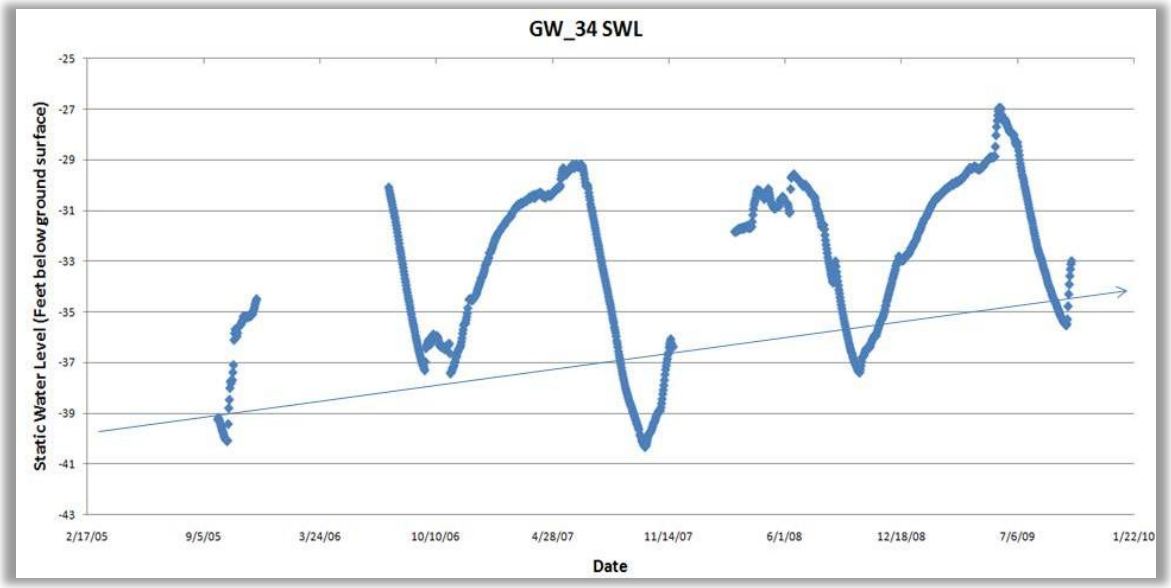


Figure 44. Water Levels at WWBWC Monitoring Well GW-34

Plotting all the groundwater elevation data for transects A to B1-B2 for water year 2009 (November 1st 2008 through September 30th 2009) helps show the spatial response of this area to HBDIC operations. **Figure** 45 clearly shows that GW-14 provides a representative up gradient control well for the purposes of documenting HBDIC operations. Wells GW-40, GW-45, GW-46 GW-48 representing the on-site HBDIC operations monitoring wells document the near-basin mounding effects of aquifer recharge. Down gradient and away from the site, wells GW-35, GW-118, GW-60, GW-61 and GW-65

show the height of the mounding decreases with horizontal distance. GW-65 clearly shows that by approximately one mile down gradient (GW-45 to GW-65), the mounding is still visually apparent.

Moving toward the outer boundary of the each of the transects B1 and B2, wells GW-110, GW-63, GW-31 all show an increase in head during the upgradient recharge operations (**Figure** 45). However, with numerous users of the HBDIC ditch also operating during this period of active infiltration from the project, recharge from up gradient water users and the Little Walla Walla River system likely plays a role in a portion of this recovery. From the extensive aquifer testing done at the project site OSU-WWBWC estimated groundwater velocity to be approximately 1 meter/day. This is significantly less than the measured response seen in the water table around the project as the project has turned on and off. The water table response to recharge changes propagates through the aquifer many times faster than the water actually moves. The next step in the process of linking recharge operations to directly helping to restore spring-creeks in the basin is to link these change in water table head to the changes in flow that occur at the down gradient springs.

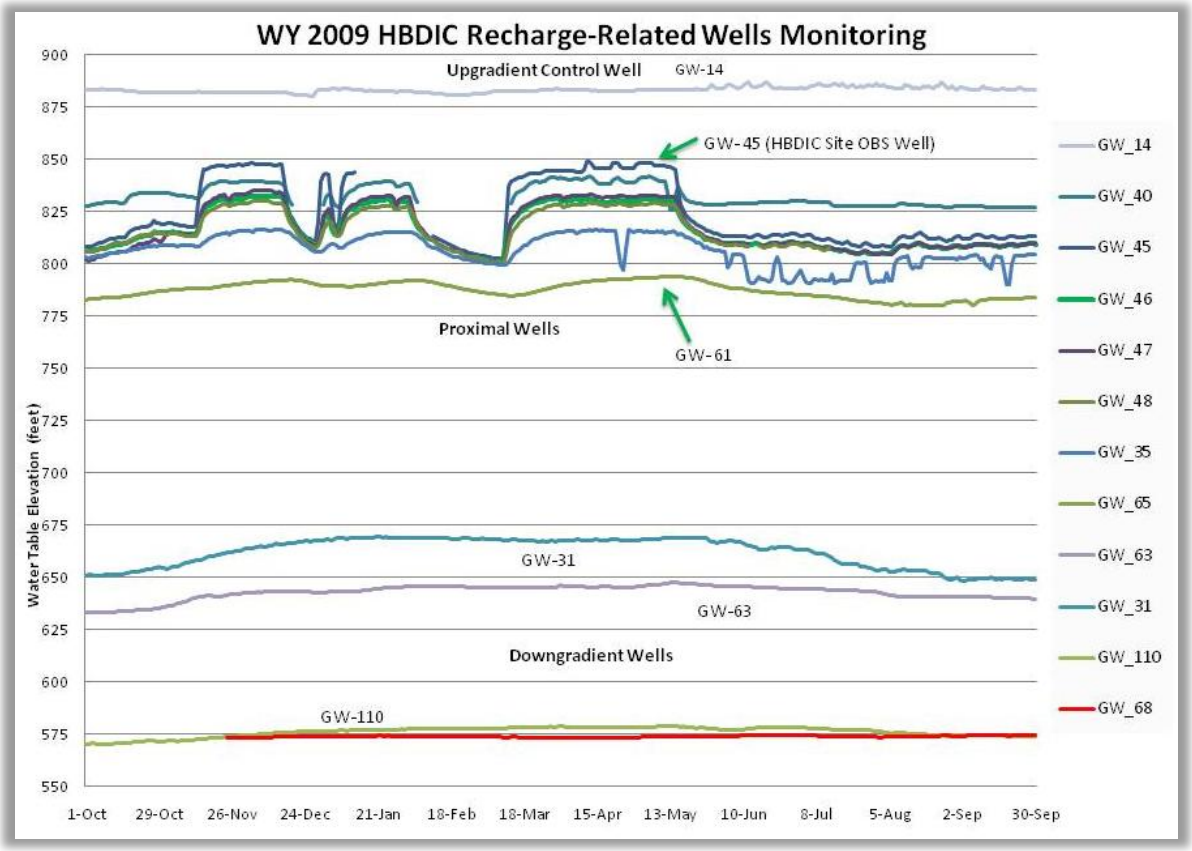


Figure 45. Groundwater Response to recharge in Johnson and Dugger Spring-Creeks Subbasins (2009)

A groundwater flow model is being constructed to assess groundwater responses to the HBDIC Recharge project, particularly overall groundwater storage and spring flow restoration. Utilizing finite-element IWFM modeling work by OSU (Petrides, 2008), WWBWC GIS water table mapping using data from the well network (Baker T. , 2010) and other USGS hydrologic studies and models, **Figure** 46 was

created to show the water table contours and general flow direction relative to the HBDIC recharge site during September 2009. Generally groundwater flows in a west to northwest direction. Additionally, specific conductance (uS) collected from groundwater monitoring sites was assessed using Arch GIS Spatial Analyst to help depict groundwater movement (**Figure** 47). HBDIC recharge site shows lower values indicating the recharge of surface water at site and down gradient movement.

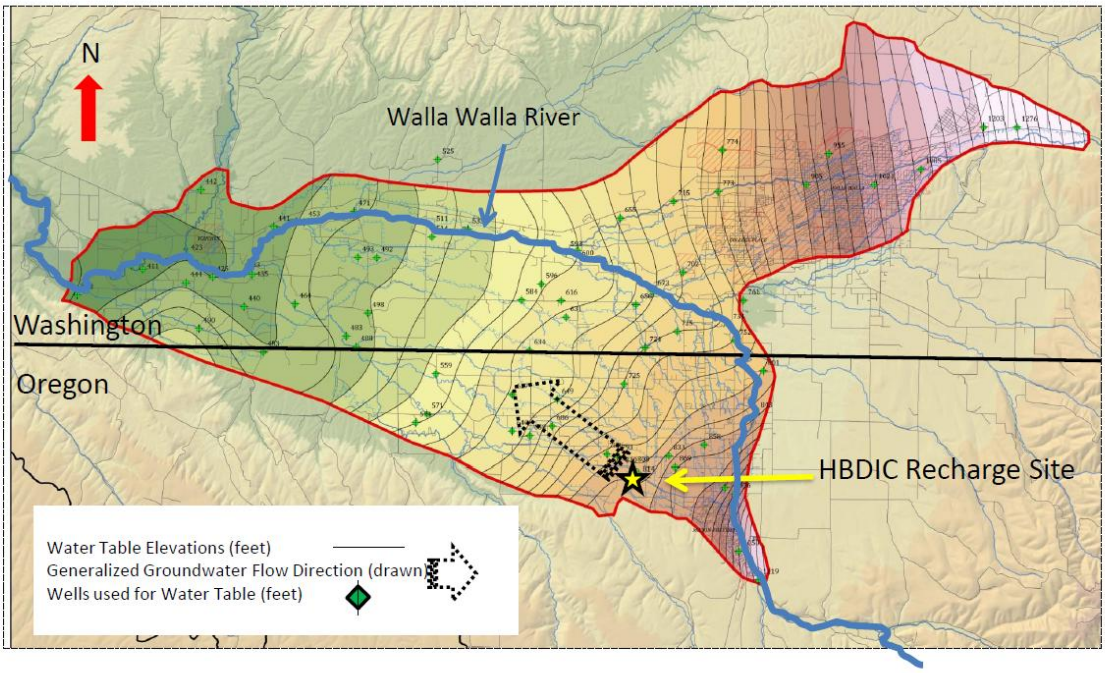


Figure 46. HBDIC Recharge Site Flow Direction(September 2009)

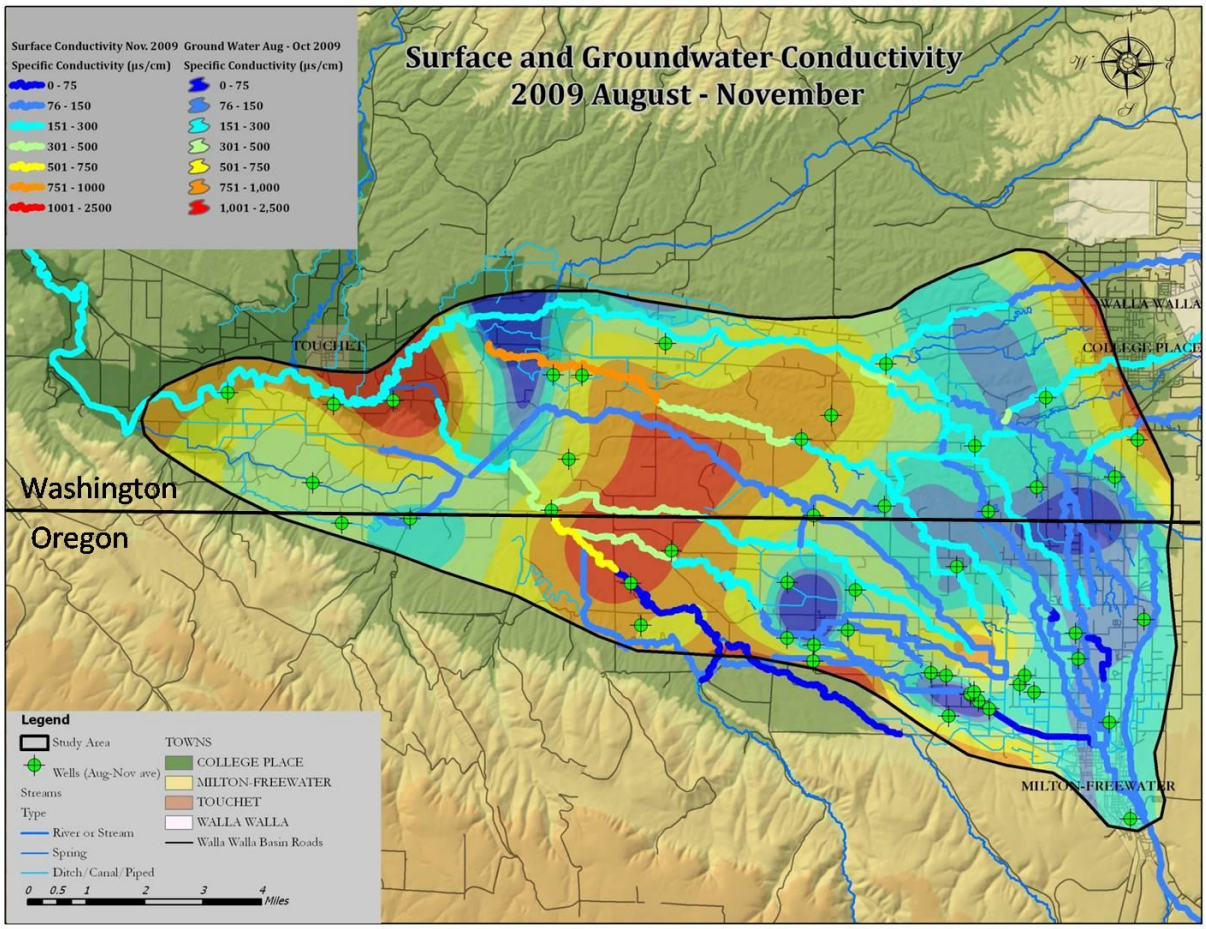


Figure 47. Groundwater Specific Conductance Map (Baker T., 2010)

Spring-Creek Responses

Since one of the stated purposes of the aquifer recharge is to stabilize and restore historic spring flows, an important part of documenting the system wide responses is to link groundwater changes interpreted to be caused by recharge operations, to the springs that flow from this aquifer system. OSU's IWFM modeling work in 2008 provided us some the first supporting evidence linking both HBDIC operations and the operation of unlined canals to the recharge of the shallow aquifer system. **Figure** 48 depicts the three scenarios run by the 2008 model for the flow in the Johnson Spring-Creek system which included; 1) Johnson Creek flow without HBDIC recharge site operations, 2) Johnson Creek flow with HBDIC recharge site operations and 3) Johnson Creek flow with the lining of the canals and without HBDIC recharge site operations (Petrides, 2008). The HBDIC recharge site clearly played a role in why Johnson Creek was running again after 25 years of being dry (**Figure** 48). However other factors helping to restore a partial amount of flow from Johnson Springs were at work preceding the 2004 HBDIC recharge operations. Possibly, with the emerging awareness of the irrigation community that ditches played a positive role in groundwater supply encouraged them to increase the amount and duration of

seasonal canal usage. Also this IWFM scenario underlines the importance the man-made canals play in recharging the groundwater system-from which the historic springs are dependent on for their flow.

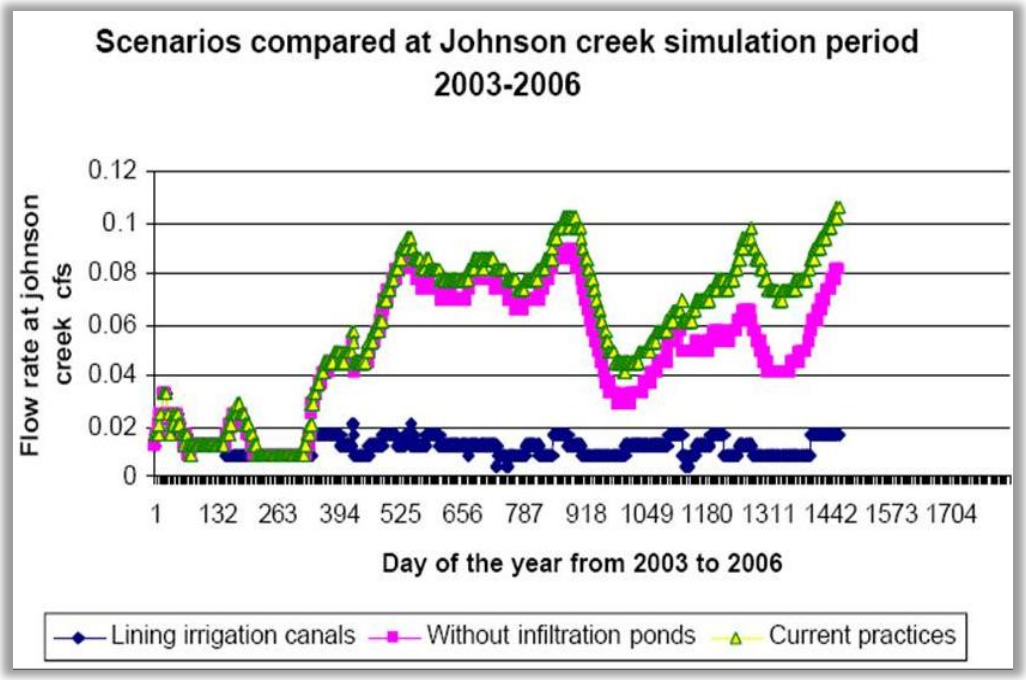


Figure 48. 2008 OSU IWFM Modeling Scenario for Johnson Creek (Petrides, 2008)

Utilizing the transect B2 from the prior groundwater response section, **Figure** 49 illustrates the groundwater and springs monitoring sites from the HBDIC Recharge site to the spring heads of Johnson and Dugger Springs. Plotted next to each of the well sites is the elevation of the ground surface (top of grade) that was surveyed by WWBWC staff during summer 2009 (Patten S. , 2010). Moving down gradient, Transect B2 covers a total distance of about 0.9 miles with a total change in topographic surface of about 70 feet from the HBDIC recharge site (~793 feet) to both flow gauges on Johnson Creek (~723 feet) and Dugger Creek Springs (724 feet). This translates into about a 1.3 % grade of topographic slope.

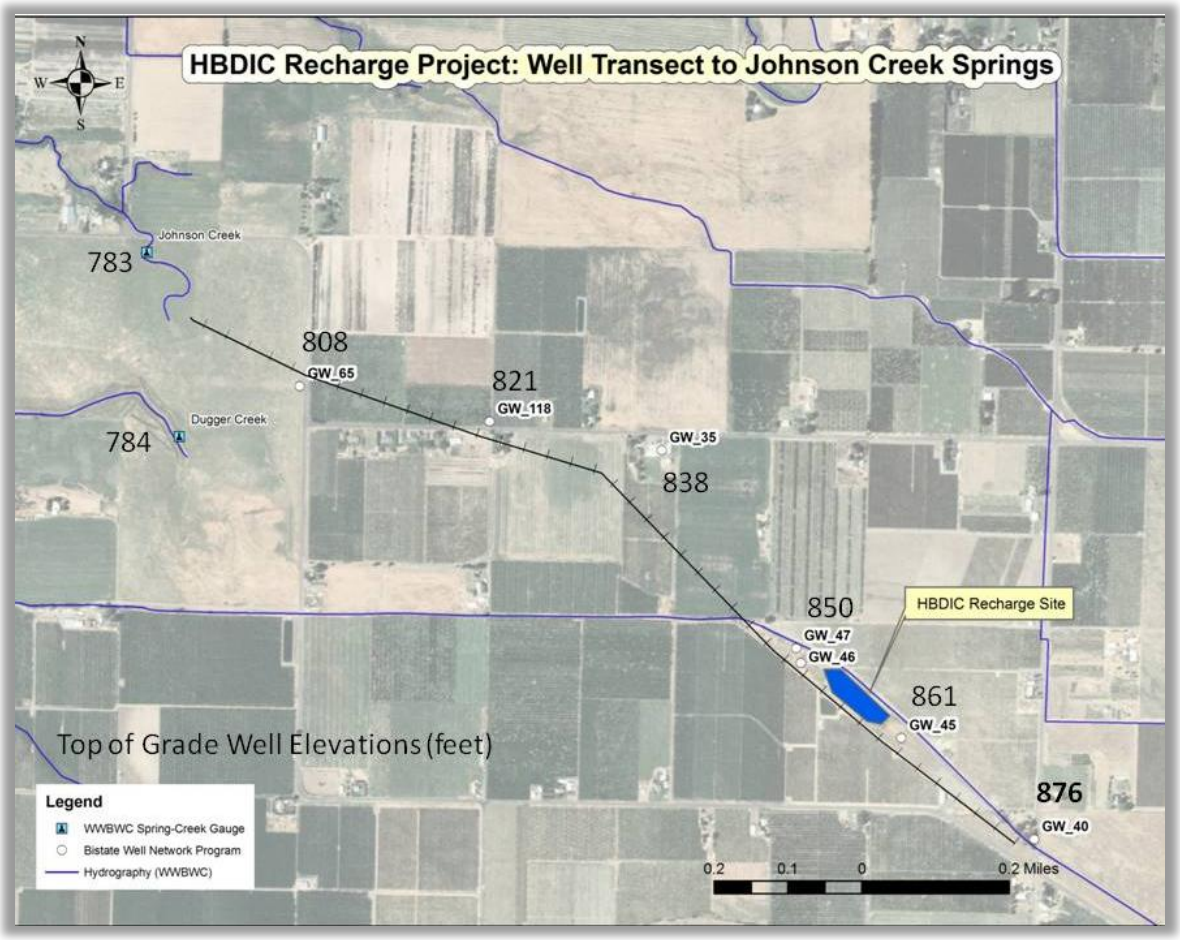


Figure 49. Transect from HBDIC project site headwaters of Johnson and Dugger Creek Springs

Figure 50 shows hydrographs for WWBWC monitoring wells from GW-40 to GW-65 along this transect with GW-65 being the closest to the headwaters of both springs. The groundwater infiltration pressure perturbations (denoted here at R-1, R-2, and R-3) can be tracked down gradient through the water table toward the near-spring well site, GW-65. It should be noted that GW-35 is a shallow well that has some use associated with it, which explains the periodic drawdown in it.

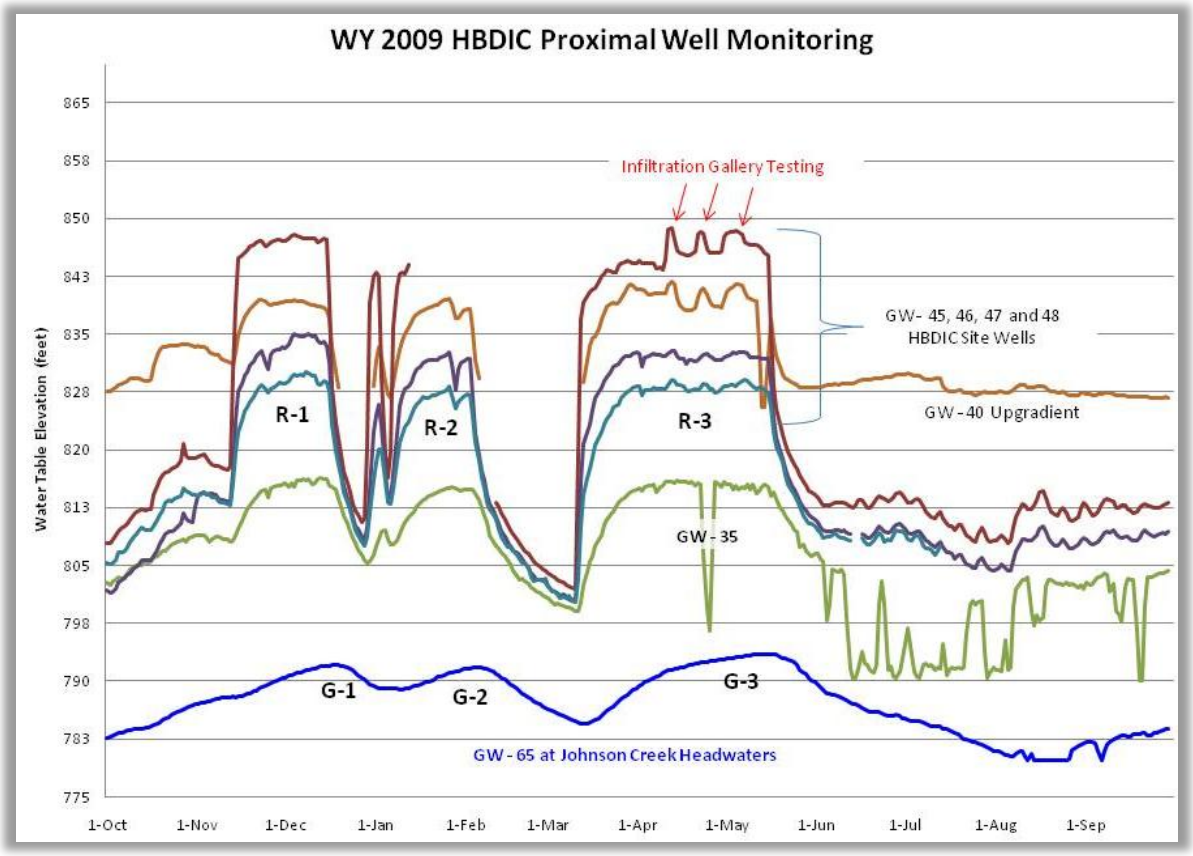


Figure 50. WWBWC Monitoring Wells (Transect B2) from HBDIC Site to near Headwaters of Johnson Creek Springs

Utilizing the changes in water level from recharge operations at GW-65 we now can look to the WWBWC spring gauges for signs of groundwater-to-spring-discharge similarities. **Figure** 51 shows this well site relative to the headwaters of both Johnson and Dugger creek springs. The horizontal distances between this well site and the actual spring heads were not surveyed as a part of this project, but were measured using the Arc-GIS distance tool. Johnson Creek's South Fork springs are approximately 1059 feet from GW-65 with a slope of 2.4% (25 feet vertical in 1059 feet horizontal). Dugger Creek spring is approximately 929 feet from GW-65 with a slope of 2.6%. These marked increases in topographic slopes relative to the estimated 1.43% slope from GW-45 to GW-65 (4780 feet) may help explain why these springs emerge at this point in the aquifer system. Other factors likely playing a role in where springs emerge are changes in stratigraphy that may decrease the permeability of the saturated and unsaturated zones. With an increase in groundwater slope and a decrease in permeability (e.g. likely due to cataclysmic Missoula flood deposition of clays and Touchet bed materials) faster moving groundwater would be forced upward (mounding) toward the topographic surface producing the historic springs that the USGS (Piper, 1933) likened to 'spillways on a reservoir'.

The WWBWC surface-groundwater monitoring network also includes more than 50 small-order springs, creeks and ditch sites throughout the Walla Walla River Valley (Lewis, 2009). The WWBWC has

three relevant gauge sites to monitor spring and creek flow in these two subbasins. WWBWC gauge # LWSJ (South Fork Johnson Creek spring) measures the elevation of a pond fed exclusively by South Fork Johnson Springs (**Figure** 52). This site along with the other gauge sites were surveyed (Patten S. , 2010) with the purpose of tracking these recharge-to-spring physical connections. WWBWC gauge #LWDC1 measures flow (cfs) out of a series of springs at the headwaters of Dugger creek. The WWBWC installed a weir structure at the site and placed a water level logger and staff gauge at the site. Periodic in-stream stage measurements are recorded and used to calculate flow data. While the site does not capture all of the numerous springs along the headwaters of Dugger Creek, it does provide an understanding of the timing and volumes of flow arising from groundwater changes. WWBWC site #LWJG is a continuous level logger placed in the engineered intake weir for the Johnson Creek reconnection pipeline (Bower R. , 2008). It was installed in 2007 with the first two full years of data being 2008 and 2009. It should be noted however that this site is downstream from the springs and there are a number of active surface water rights that may influence the data recorded at this site. The map also shows other unmapped spring-seeps that likely provide some flow to Johnson and Dugger creeks. These features can be seen as wetland type swales in the fields near GW-65.

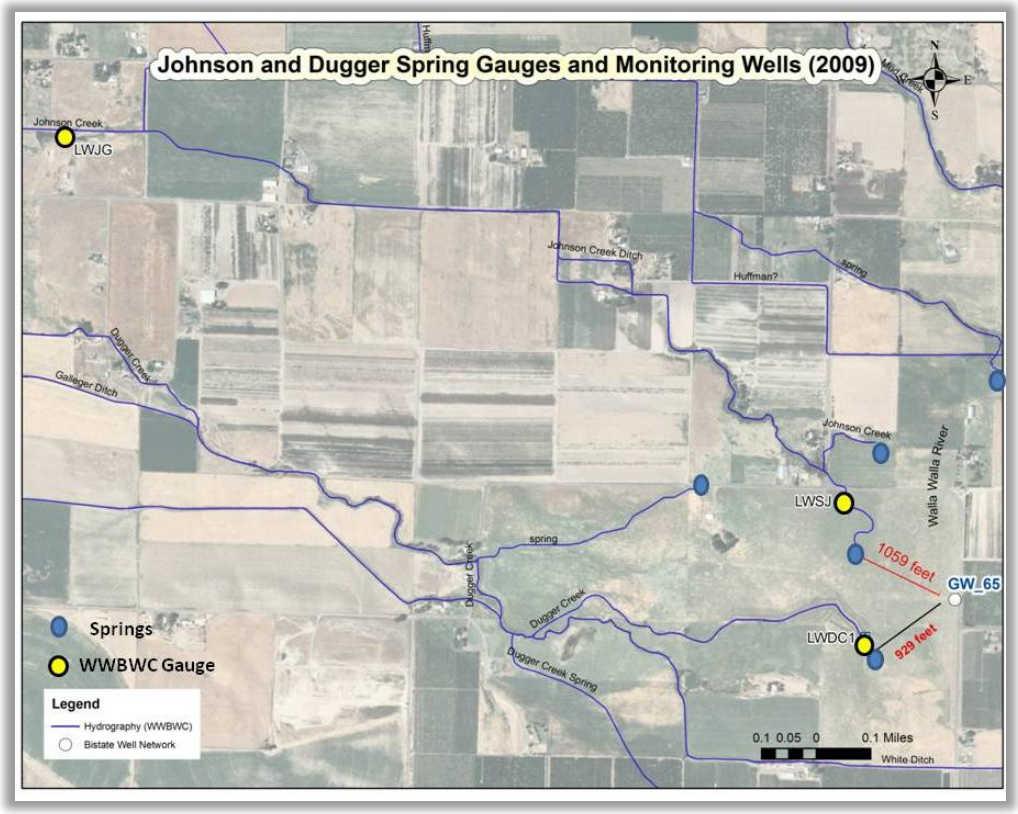


Figure 51. Aerial Map of GW-65 and Gauges-Springs on Johnson and Dugger Creeks

Figure 52. South Fork Johnson Springs (Pond) – Before and After HBDIC Operations (Bower)

Utilizing the water level elevation data from WY 2009 (October 1st 2008 through September 30th 2009) for both GW-65 and the spring-pond level data from LWSJ a graphical comparison was done (**Figure** 53). Groundwater level peaks G-1, G-2 and G-3 appear to correspond directly to pond water levels peaks Sp-1, Sp-2 and Sp-3 in the spring-fed pond. Therefore with this data set we can demonstrate the following logic:

Recharge Action = Groundwater Response = Spring Response

R-1 = G-1 = SP-1

R-2 = G-2 = SP-2

R-3 = G-2 = SP-3

Therefore:

Recharge Action = Spring Response

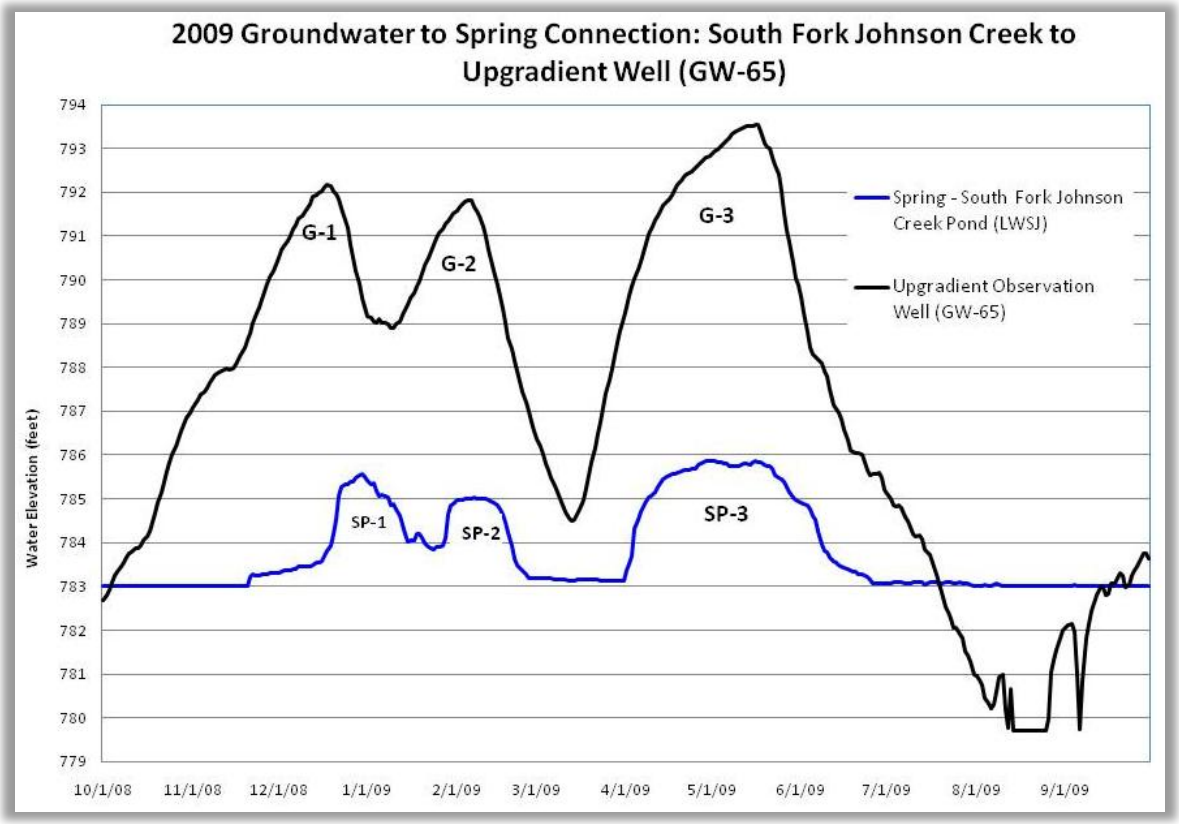


Figure 53. GW-65 vs LWJS Comparison of Groundwater to Spring Response to HBDIC Recharge Project Operations

Starting in the early 1930s some historic data was collected by the USGS (Piper, 1933) in support of the Supreme Court case Oregon v. Washington over management of the Bi-state Walla Walla and Little Walla Walla River system. The State of Oregon continued collecting both surface and groundwater data on many of the springs until the middle 1940s, and contined some of the well monitoring sites until present. Using historic data collected from 1932 through 1942 and WWBWC gauge data for Johnson Creek we made a comparision of historic versus current flow conditions. Historic grab sample data was compared against daily-average data that the WWBWC has collected. In order to graph them together, WWBWC data was averaged to monthly values that could be compared with the cooresponding values of the historic dataset. **Figure** 54 shows this comparison for historic water years 1932-34, 36-43 against current data from water years 2008 and 2009. For the water years 2008 and 2009 we utilized the WWBWC gauge data from LWJG as well as a gauge measuring the tail-water from the HBDIC Richartz Pipeline. The tail water was subtracted from the Johnson Creek flow as it is there artifically and would not represent a true comparison to historic conditions.

Historical data shows a relatively constant flow throughout the year which corresponds to more total groundwater storage available to provide this baseflow. The current data mimics the general pattern of the historic flows where a smaller peak flow value in the fall (November-December) and a large peak flow during the spring freshet (April-June). WY 2008 appears to be lower than the subsequent

WY 2009 flows for Johnson Creek. The early season WY 2009 data was not available due to a faulty logger. Clearly the groundwater to spring pattern for this location helped to better understand that groundwater recharge and discharge up gradient lead to flows in the down gradient Johnson Creek springs.

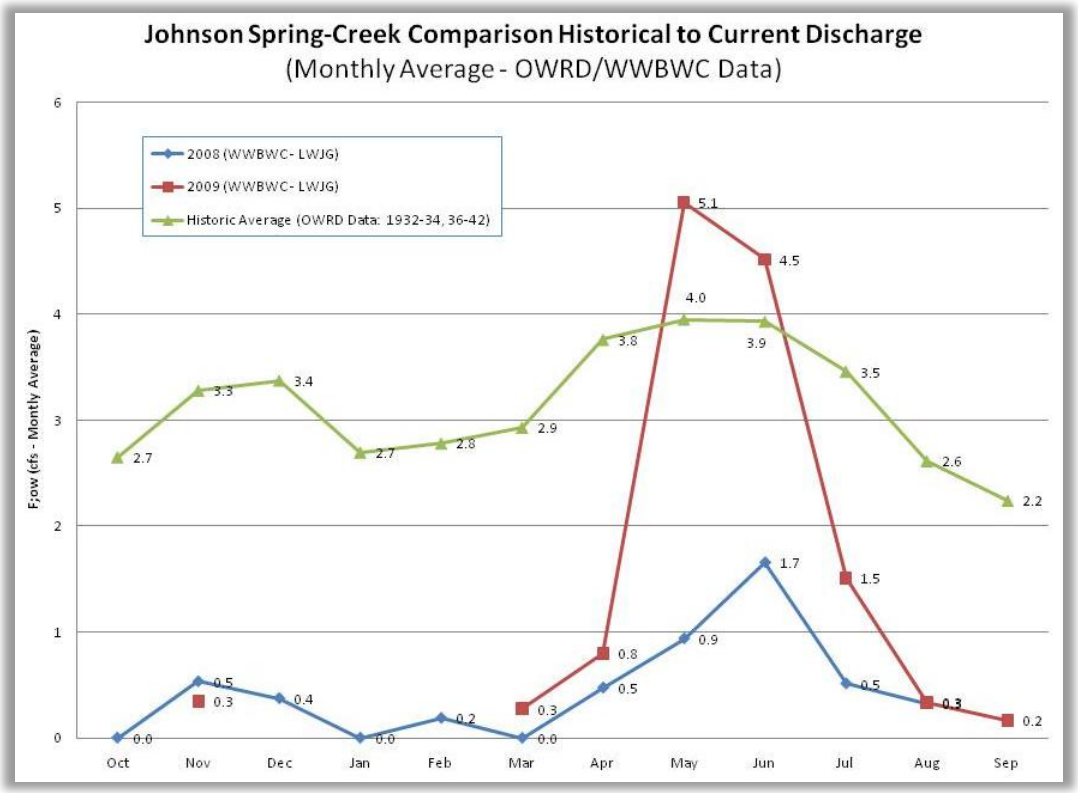


Figure 54. Comparison of Historic versus Current Johnson Spring-Creek flows (OWRD/USGS and WWBWC).

Turning to the other proximal springs relative to the GW-65, Dugger Creek Springs; **Figure** 55 shows the 2008 water year flow data for the spring gauge at Dugger Creek Springs relative to the groundwater pertubations from HBDIC recharge activities (GW-65). Similar to that shown in the Johnson Creek datasets, Dugger Creek surface flows also seem to correspond directly to HBDIC recharge site operations.

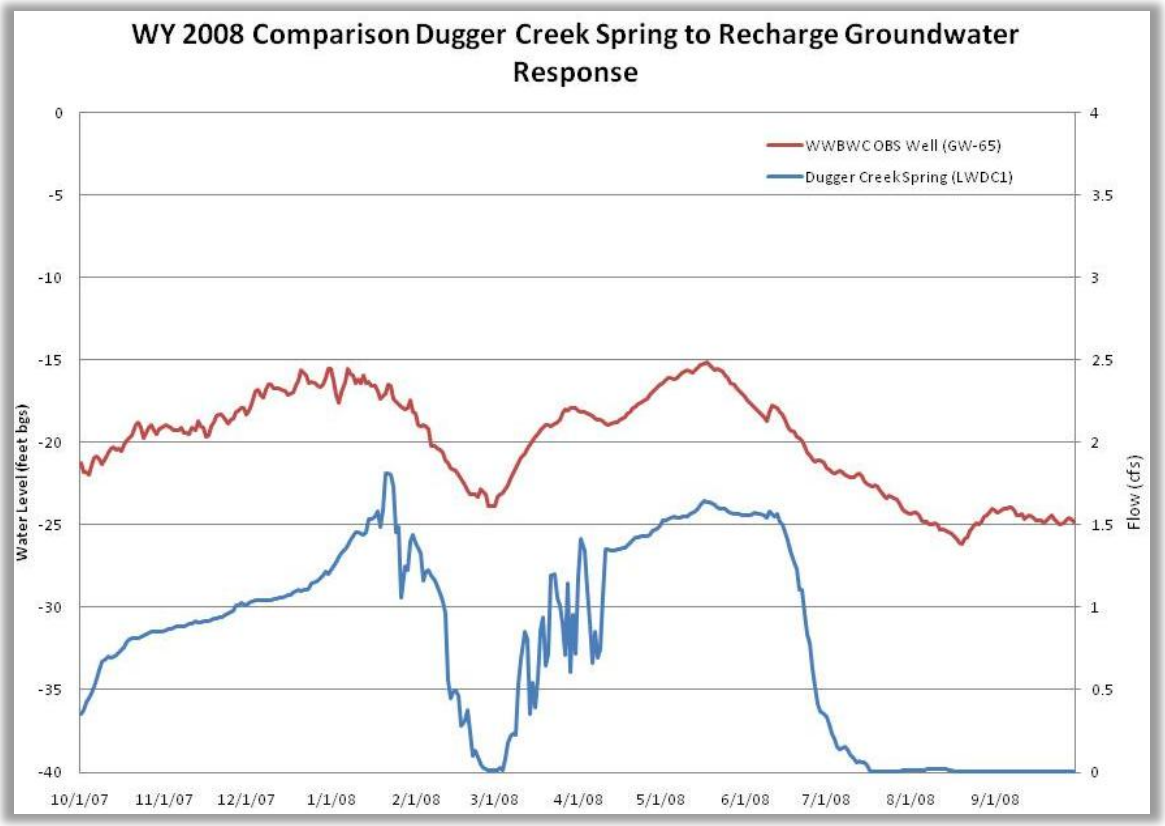


Figure 55. Comparison of Recharge Groundwater Response to Dugger creek Flow (WY 2008)

Linking Spring Responses to Declines in Groundwater Storage

The seasonal fluctuations of the water table in the sub-catchments discussed in the previous sections can be shown to link both the infiltration of water from recharge to the discharge of water through groundwater extraction. However with a system appearing this responsive to change, how is groundwater storage as described in the previous sections actually expressed?

In an early section, **Figure**s 8 and 9 showed that the historic static water table readings showed high variably in levels for any given water year. This variability can be further defined by plotting the values by month to show seasonal change. **Figure 56** shows a summary of water table measurements taken at the OWRD State Observation Well #850 from the 1930's until present. Years with the most monthly static water measurements were selected and synthetic data was generated to map the seasonal trend apparent in the entire dataset. Starting in the 1930s through early 2000 the seasonal pattern of the water table are reasonably consistent across the period of record. However, while the pattern is similar the height of a given year (Y-axis) decreases through time toward the bottom of the well, which subsequently went dry. This overall drop in average readings represents the historical loss of storage in the aquifer system. As spring flow has been shown to be linked to elevation of the groundwater this explains why springs such as Dugger or Johnson Creeks flowed perennially in the past but now flow only when the elevation of the peaks (**Figure** 56) are above the required elevation at the

surface. This helps us better understand the role storage plays in the base flows of springs and likely the Walla Walla River.

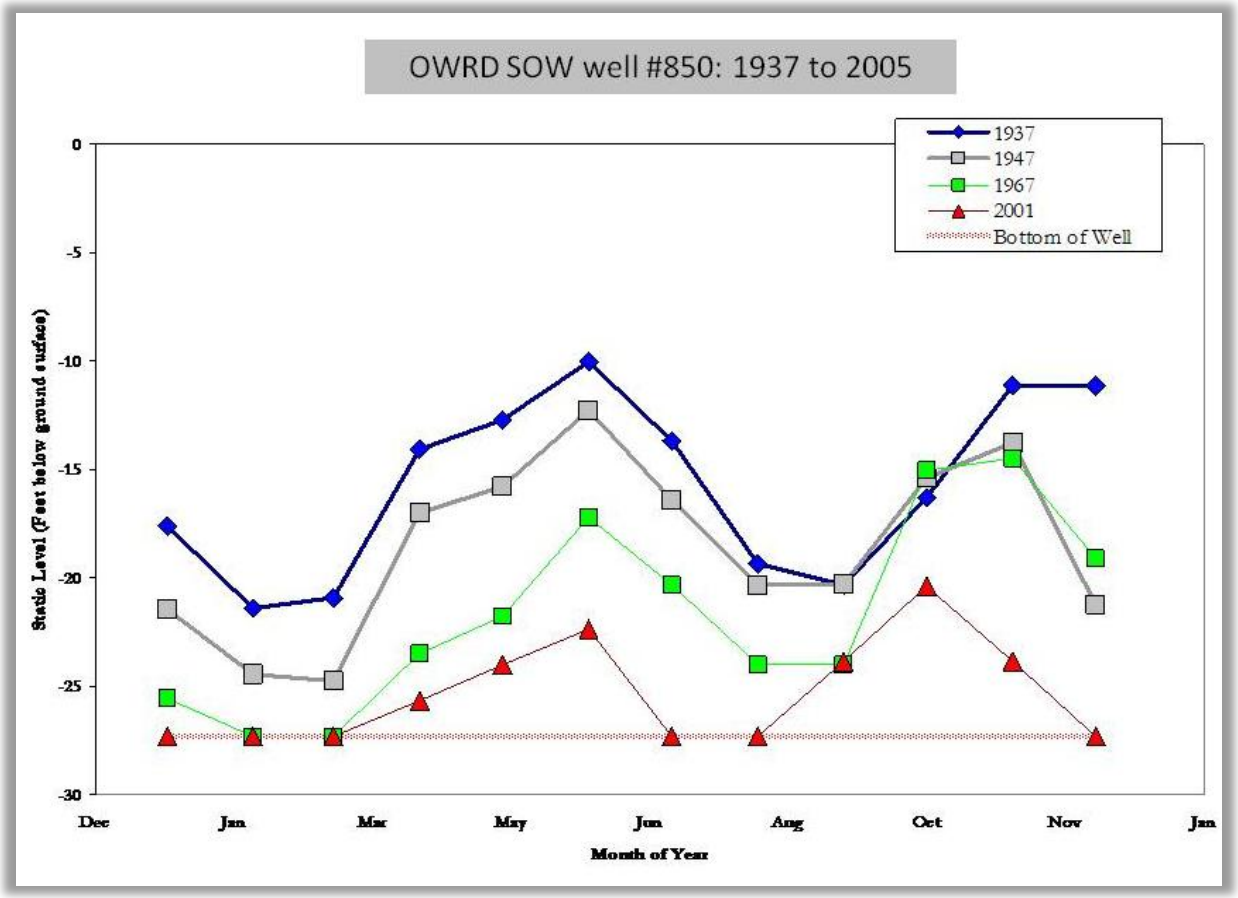


Figure 56. Walla Walla Basin Aquifer Water Table Fluctuations and Historical Trends

Other Recharge Results: Johnson Creek Recovery

In the early 1930s, just one of the three springs that feed Johnson Creek was measured to range between 2-4 cfs during the summer months. During that time, Johnson Creek served a series of water rights through and past the town of Umapine and most likely was the primary water supply during the establishment of the town in the mid-1800s. For decades what little water came out of the springs, didn't make it down to the lower end of the system.

Starting in 2003, the flows are returning to Johnson Creek after being dry for nearly three decades and appeared to incrementally increase from the subsequent year. The headwaters of Johnson Creek, like the observation well SOW #853 discussed earlier, are directly down gradient from both the Hudson Bay District Improvement Company Aquifer Recharge project and the other up gradient water management changes mentioned earlier. During the winter of 2007, the WWBWC, HBDIC and citizens from the town of Umapine, using OWEB funding, worked together to reconnect this disconnected

tributary to the Walla Walla River via the Dugger-Schwartz-Pine Creek tributary system. Today Johnson Creek flows for a portion of the water year directly to Dugger Creek (**Figure** 57). This is water that had not been historically available for down gradient flow restoration before the HBDIC testing site operations. These results emphasize both the ability of recharge to play a role in helping to restore flow to historic springs and serve as a cautionary note on recharge and down gradient springs that have been abandoned due to declining flows.

Figure 57. Johnson Creek flowing again after 25 years (Umapine, Oregon – Bower)

Summary of Spreading Basins Testing and Recommendations

Spreading basins are effective at HBDIC and have shown their ability to move large amounts of water into the groundwater system. Relative to the value of the water being stored, this tool can be considered the preferred method of water storage. Results from the 2004-9 testing indicate that clogging and/or subsurface mounding of groundwater are issues that will need to be addressed for the long term operations of this site. Off-season treatment and removal of the sediment layers that appear to be accumulating is recommended as first steps toward this goal. There are numerous techniques used by larger recharge programs that can help address these issues of long term operations. Water quality for the site, both source and recharged groundwater, has shown itself to be of good and consistent quality. On-site water table monitoring may indicate that localized groundwater storage is recovering from HBDIC recharge activities, although additional years of monitoring will help confirm this trend. Additional site upgrades should include a reexamination of the intake structure and its ability to measure flow more effectively with regards to White Ditch fluctuations as well as water backing up from the first spreading basin. The overflow flume site should also be upgraded from a portable weir to a concrete structure to ensure that excessive water leaving the site is measured.

PART III. INFILTRATION GALLERIES

Infiltration Gallery Testing

Overview

Making irrigation systems more efficient through the lining and piping of irrigation canals is another tool for water management. While you lose the aquifer recharge benefits you gain more surface water volume with which to irrigate. Irrigation efficiency in these terms does provide the Walla Walla basin with a method to better manage surface waters. However with the urgency of addressing the declining aquifer system and drying up of spring-creeks, developing methods of incorporating managed aquifer recharge into piped and lined canals systems is critical. The idea is to save water during times of scarcity without losing the ability to replenish the natural groundwater storage of the system. Furthermore the availability of acres of open ground, such as used for spreading basins is not always available or cost effective. Subsequently numerous smaller recharge areas spread spatially in watershed may be helpful to reduce the subsurface mounding created by larger projects and better disperse the storage of water.

The concept of recharging groundwater in subsurface galleries or chambers is not a new one. For years storm water managers in municipalities and along road systems have devised ways to collect run-off from impervious surfaces and infiltrate that water into the subsurface so as to avoid overland flow and flooding. In these situations the water can often contain pollutants and suspended solids that make their deposal difficult. The risk of toxic water quality issues along with the clogging of disposal area makes this a unique water management challenge. More recently many municipalities in water restricted areas of the world are developing these subsurface recharge galleries to be used in parks, golf courses, and in some cases for capturing run-off from roof tops for backyard recharge programs.

The methods and designs utilized in the infiltrating of storm water can be built upon in the case of recharging with clean winter source water such as the case at the HBDIC recharge site. The HBDIC team decided that there was a need to test the varying methods and materials for infiltrating recharge water into the subsurface. A number of designs and materials were reviewed to determine which infiltration galleries were tested including material costs versus their perceived effectiveness at recharging groundwater. From reviewing other recharge testing projects we knew that the most difficult challenge for these systems was clogging. The presence of suspended solids in the source water along with the possibility of biological clogging from algae growth in the galleries was an issue that has thwarted effectiveness of these projects in the past. In designing the testing galleries, collaboration was established with Adam Hutchinson who leads the Orange County Water District's managed aquifer recharge (MAR) program. The Orange County team has been testing infiltration galleries type MAR projects under golf courses, in city parks and in other locations where small, discreet subsurface recharge sites were needed to maximize the programs ability to recharge and store water. Information from their experiences was used extensively to design the galleries as well as develop the testing methodology for the project.

Infiltration Gallery Designs, Permitting and Testing

Four types of subsurface materials were used to design for infiltration galleries at the upper end of the HBDIC recharge site (See **Figure** 25). The materials were chosen primarily to compare the cost of materials relative to their anticipated effective recharge rates and how those rates may decrease through time due to clogging. Infiltration gallery # 1 (IG-1) was constructed using 4" perforated pipe (ADS) that can be purchased inexpensively from any home builder supply and its easy installation allowed for low labor costs. Infiltration Gallery #2 (IG-2) utilized 4 inch perforated PVC pipe typically used in domestic septic-tiling systems. This was also fairly easy to install; also keeping the overall constructions costs down. Galleries #3 and #4 both utilized materials developed by companies designing subsurface infiltration methods for the storm water industry. Infiltration Gallery #3 (IG-3) was built with *Stormtech Chambers* that are open bottomed allowing the water to infiltrate downward. Further, they can be designed to be periodically cleaned of sediment and debris. Infiltration gallery #4 (IG-4) utilized *Atlantis Raintanks* which resemble boxes that are open on all sides allowing for intra-chamber water exchange, but the 336 "tanks" each require assembly making their installation costs the highest of the four designs**.** Preliminary trials of these 'tank' style galleries were conducted successfully in the City of Adelaide Australia (Higginson, 2007)**.**

Figure 58 shows the general schematic of the completed IG testing area while engineered designs for the galleries, turnout and other structures can be found at the WWBWC offices. Water is diverted from the White Ditch via a self-cleaning, screened weir (A) situated on the bottom of the canal. Water moves down gradient through the 21 inch main pipe to a stilling well which has the primary control valve (butterfly) to release water in to the testing galleries (B). An *YSI* Model # 6920 V2 turbidity-temperature-conductivity meter is at this location allowing continuous data recording during the operation of the galleries. IG-1, 2, 3, and 4 are supplied water from the main pipeline via 5" connector pipes (C) that have 5 inch butterfly control valves and *McCrometer* (Model #EO3000) propeller-style flow meters that measure both instantaneous flow rates (gallons per minute) as well as totalize the inflow (total gallons x 100). Each set of galleries were installed with air-release vents that also provide a method by which to visually inspect inside the gallery. These vents are located in different locations depending on the type of gallery. At the end of the main line is an overflow basin (D) that allows a location to drain any accumulated sediment from the intake and main pipeline structure prior to turning on the infiltration galleries. Adjacent to the gallery testing area HBDIC Observation Well #4 (GW-45) is located just downgradient (E). **Figures** 59 and 60 show the materials and installation of the IG-3 and IG-4 galleries.

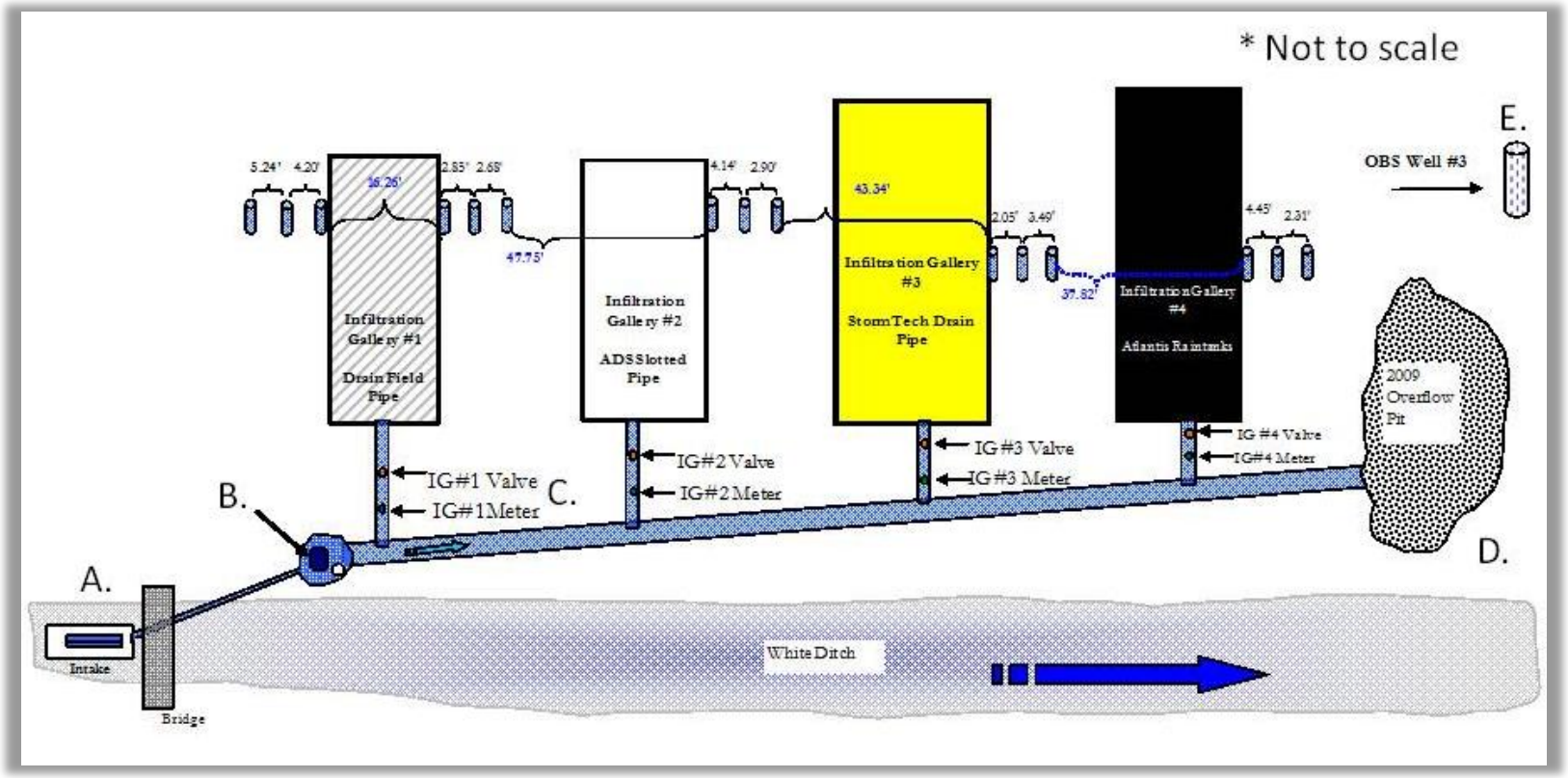


Figure 58 Infiltration Gallery Testing Area (HBDIC Site)

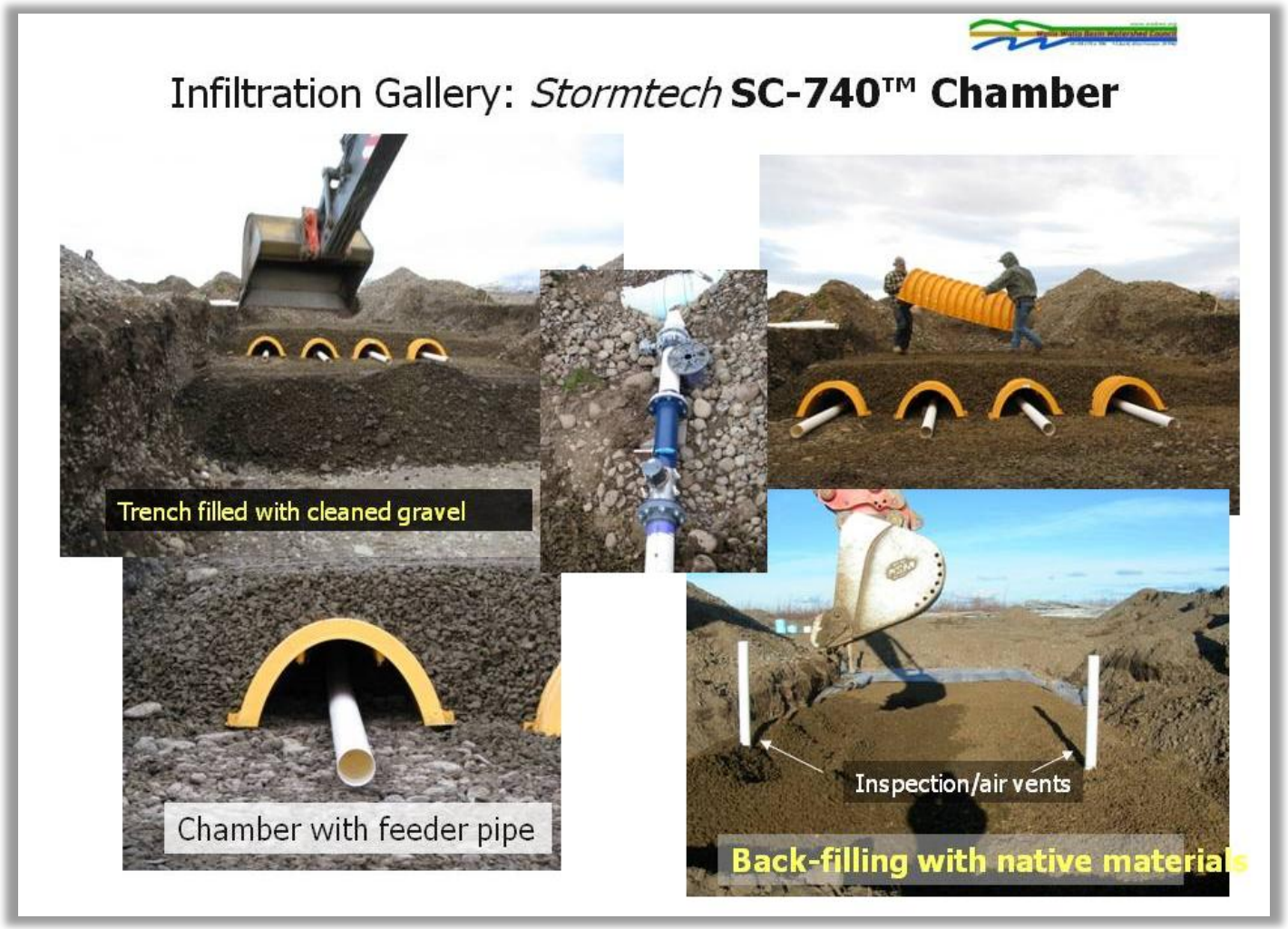


Figure 59. Infiltration Gallery #3 - Stormtech Chamber Installation (2008)

Figure 60. Infiltration Gallery #4 - Atlantis Raintanks Installation (2008)

Next to each of the galleries piezometers were installed in perpendicular transects away from the galleries in order to measure both groundwater mounding as well as water quality (PZ-1 through PZ-15). The piezometers varied on depth from approximately 4 to 11 feet in length with a horizontal spacing of 2 to 5 feet between each gallery with the first piezometer located directly adjacent to the infiltration gallery. Water level recorders (*In-situ Inc. LT100, Unvented, pressured transducers)* were used to measure water levels and temperatures during each of the individualized gallery testing. Each piezometer was outfitted with pre-packed mesh screens so that samples could be extracted effectively from each measurement point**. Figure** 61 shows the various gallery-specific monitoring equipment installed at the site.

Water recharged below the ground surface is classified by the State of Oregon and the Federal Environmental Protection Agency as requiring special permitting and review under the Underground Injection Control (UIC) permitting program. The HBDIC team worked with the Department of Environmental Quality (ODEQ) to apply for and receive a UIC permit to test all four galleries (2009, ODEQ's UIC # 13233-1, 13233-2, 13233-3, 13233-4). Under this approved application (Bower R. , WWBWC-HBDIC's Infiltration Gallery Testing Project: Application for UIC Permit (ODEQ), 2008) a summary of results for the HBDIC site water quality monitoring program and the results to-date were supplemented with detailed gallery designs and additional turbidity, total suspended solids (TSS) and total organic carbon (TOC) testing to track potential clogging of the galleries. As the HBDIC recharge site already has a permit from Oregon Water Resource Department (OWRD #LL1189) to divert water for testing, no further water use permits were required. The galleries were specifically designed to have a separate water intake from that of the site's spreading basins so they could be tested independently. While the water recharged would be important to helping the overall goal of recharging the aquifer, the main purpose of this installation was for testing purposes. After receiving the permit in December 2008, they were constructed over an 8 week period and were ready for testing starting in late January 2009.

Infiltration Gallery Testing Plan

The scheduled testing for the first recharge session aimed to accomplish two main goals. First, each gallery would be initially run independently of the others to measure the individual recharge rates and monitor any immediate changes relative to clogging during the first week of operations. Each gallery was to be run for a week and then turned off for 24 hours before the next down gradient gallery was turned on. Operating more than one gallery at once also created the potential problem of cross influencing each other through the mounding of subsurface water due the close proximity of the galleries therefore, individualized testing was preferred. The testing would take a total of 5 weeks to complete. After this initial individualized testing the galleries were to be all operated in tandem for the remaining portion of 2009 to track any long-term changes in recharge rates over a recharge season or from year to year.

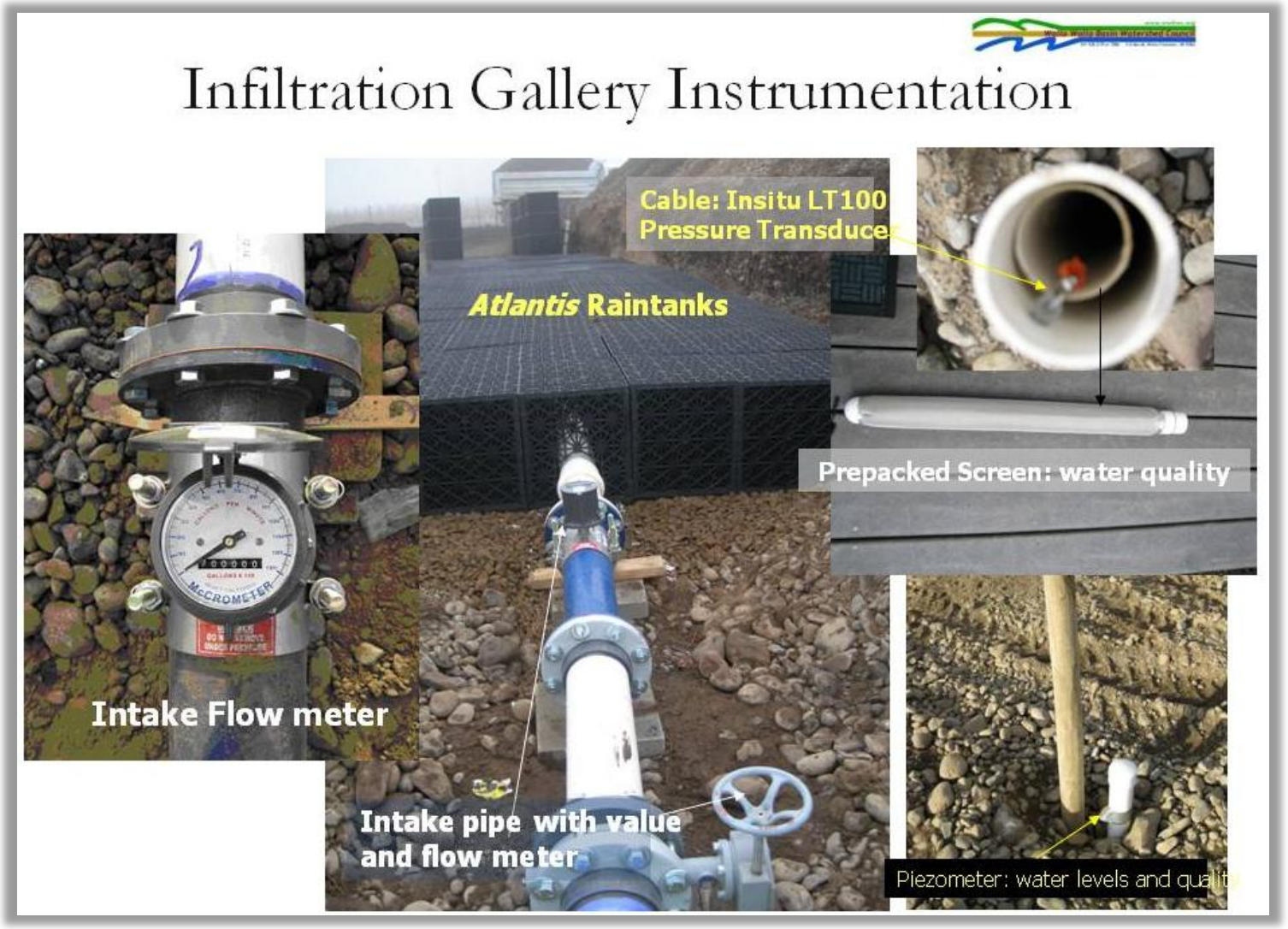


Figure 61. Infiltration Gallery monitoring equipment (2009)

Turbidity, TSS and TOC measurements were to be taken during both the individualized and tandem testing at several pertinent locations and sent to *Edge Analytical Inc.* in Burlingame, Washington. Samples were collected in sterile, 250 ml bottles from the channels edge at the Little Walla Walla River diversion from the source waters of the Walla Walla River. Measurements were also taken at the intake structure of the galleries where the YSI continuous meter was recording turbidity and total dissolved solids in 15-minute intervals during operations. These samples could then be compared to build a regression relationship between TSS and turbidity. By characterizing this relationship the use of turbidity meter can help both with the testing of the galleries as well as establishing water quality guidelines by which to operate the HBDIC and other future MAR sites in the basin. When this information is further linked to mainstem flow, real-time monitoring could help to automate a basin wide recharge system. The purpose of measuring at both the Walla Walla River and at the HBDIC site was to further investigate and potential change in TSS and TOC values as the water moved through the conveyance system.

Infiltration Gallery Testing Results – Preliminary

Construction of the site lasted until late January 2009, just a few days before the Little Walla Walla diversion annual shut down. This allowed only a short test of IG-1 to start the season. Later in February all the galleries were operated for 5-7 days to test all of their individual recharge rates and map the mounding with the piezometers. It was found during the operations of IG-2, the meter's totalizer was not operating. This made the instantaneous portion of the meter the only way by which to monitoring operations. At IG-3 and IG-4 it was found that the 5" feeder pipe was sized too small for these two galleries as air vents at the far end of the galleries showed water was not making to the gallery ends. Therefore, the results for these two galleries under-estimate the true operation rates for *Stormtech* and *Atlantis* style designs. After the individual gallery testing was completed, galleries were operated as spaced pairs (IG-1 and IG-3, IG-2 and IG-4). Lastly, the YSI turbidity meter had power-source difficulties that limited the 2008-9 water quality monitoring to TSS lab sample source to intake comparisons.

At the time of this report the 2010 season has not been completed, so the 2008-9 results are shown along with preliminary information for 2009-10 season (**Table** 6). The galleries have different infiltration areas (due to the materials used and restriction on the site area) and once the rates were normalized by infiltration-area IG-2 seems to have the highest average infiltration rate (2008-9) of 1.67 cfs. Of course with IG-3 and IG-4 having a restricted inflow pipe, their values are likely to be significantly higher than shown here. The galleries combined to recharge approximately 180 acre-feet of additional recharge water (2008-9) during a very limited operation period. Preliminary 2009-10 results show some potential changes in flow rates with all galleries appearing to lose 10-20 gpm from the prior season. IG-1 appears to be operating at about 1/3 of the prior season but it is unclear if that is a factor of clogging or some influence of individual versus dual (IG-1 and IG-3) gallery operations. The galleries have contributed approximately 488 acre-feet of additional recharge at the HBDIC site to date.

Reviewing the preliminary TSS samples from the Little Walla Walla Diversion and the IG gallery intake, it appears there may be a weak correlation between sites suggesting some attenuation of

suspended solids between locations **(Figure** 62). Water level data at all 15 piezometers provided detailed water mounding profiles for each of the galleries during the 2008-9 seasons as shown for IG-1 in **Figure** 63**.**

Recharge Season	Infiltration Gallery #	Average Flow (gpm)	Average Flow (cfs)	Infiltration Area (feet^2)	Average Flow (cfs) - Area adjusted (1086 feet)	Total Volume (2009) (gallons)	Total Volume (2009) (acre-feet)	**Comments**
2008-9	IG - 1	371.3	0.83	667	1.35	9,160,000	28.1	Piezometers with TSS sampling
2008-9	IG - 2	460.0	1.02	667	1.67	*10,156,800*	31.2	*Estimated Volume (days x average rate)*
2008-9	IG - 3	539.4	1.20	**1,086**	1.20	15,882,700	48.7	5" intake constricts total rate
2008-9	IG - 4	568.2	1.27	1,008	1.36	23,379,400	71.8	5" intake constricts total rate
					Season Total Recharge Volume	58,578,900	**179.8**	IG-2 and Overflow pit not induded
Recharge Season	Infiltration Gallery #	Flow (gpm)	Average Flow (cfs)	Infiltration Area (feet^2)	Average Flow (cfs) - Area adjusted	Total Volume (2009-10) (gallons)	Volume To Date (acre-feet)	**Comments**
2009-10	IG - 1	***115.0***	0.26	667	0.4	22,425,200	69	Reduced Rate - dogging or dual operations?
2009-10	IG - 2	452.0	1.01	667	1.6	N/A	N/A	Volume not estimated
2009-10	IG - 3	520.0	1.16	1,086	**1.2**	22,428,500	68.8	5" intake constricts total rate
2009-10	IG - 4	560.0	1.25	1,008	1.3	30,495,400	93.6	5" intake constricts total rate
2009-10	Overflow Basin	190.0	0.42	N/A	N/A	25,131,000	77.1	Area changed between seasons
					Total Recharge Volume - To Date	159,059,000	**488.2**	IG-2 not induded

Table 6 Infiltration Gallery Testing Preliminary Results

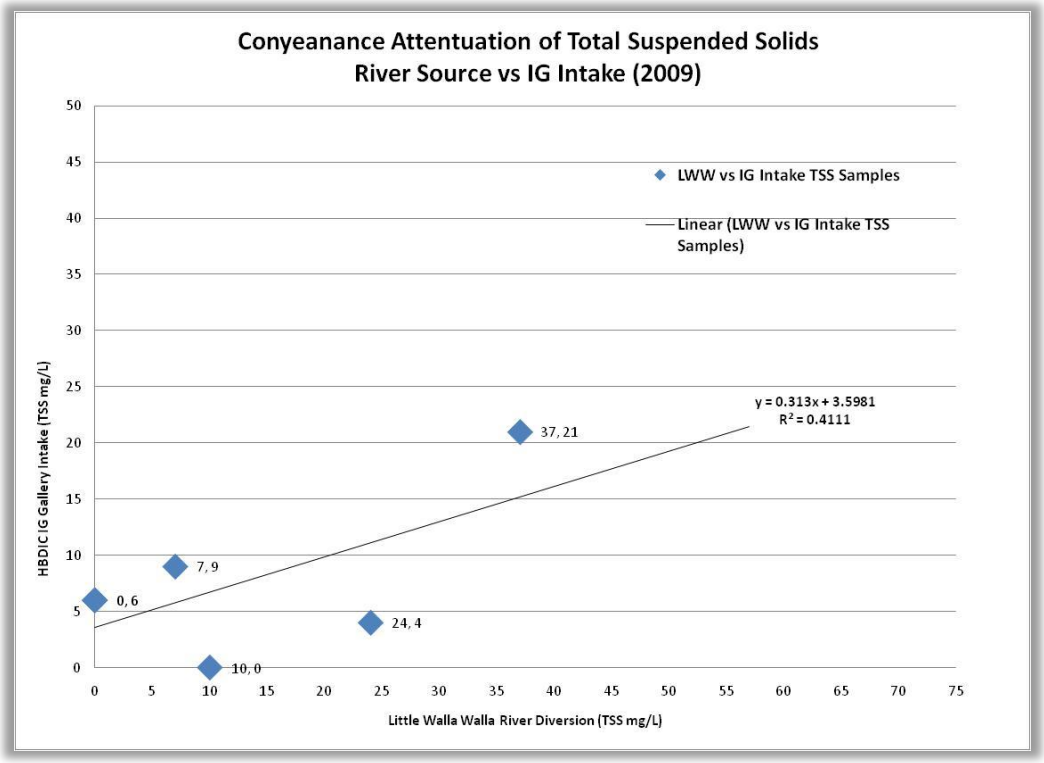


Figure 62. Preliminary Results of TSS and Conveyance Attenuation from Source to HBDIC Recharge Site

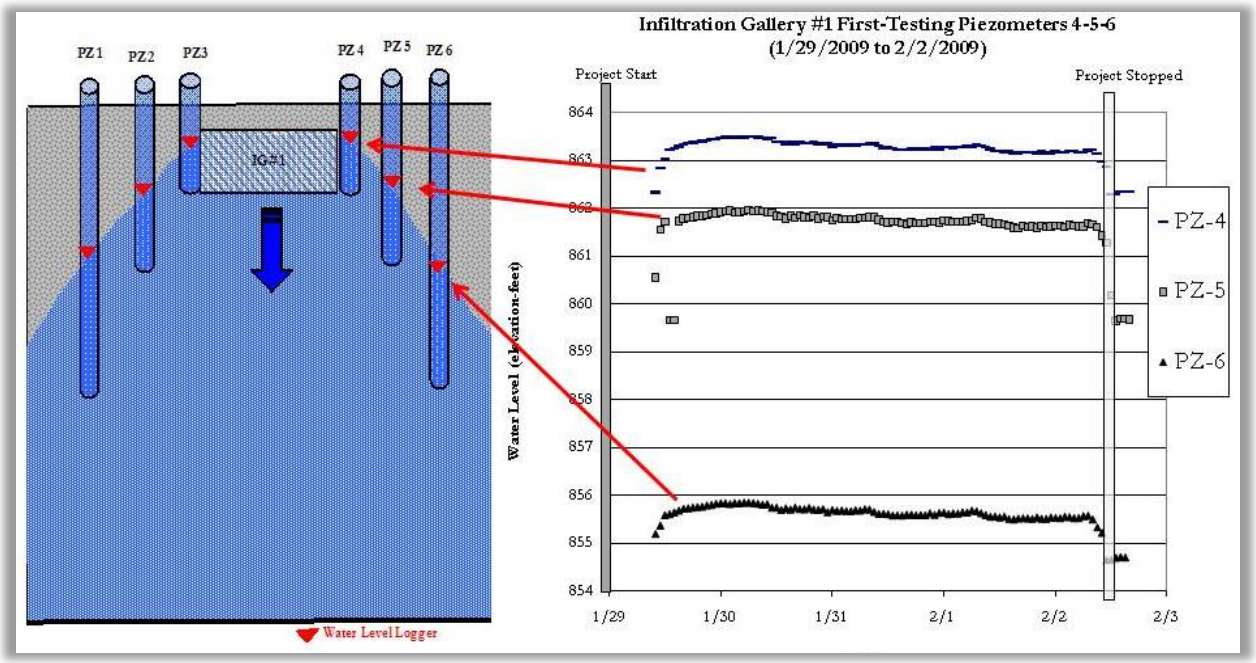


Figure 63. Piezometer water level results from initial operations of IG-1 gallery (2009)

Cost-Effectiveness Summary

The limitations poised by the small intake feeder pipes combined with the galleries being limited in mounding area make doing a straight forward cost-benefit (recharge rate vs. costs) analysis impractical. If the galleries are operated and tested individually in the future, and larger feed pipes are installed in IG-3 and 4, perhaps an estimate can be generated. The galleries as currently configured will serve to test the clogging issue, which is really the most pressing of the original research questions. Table 7 provides a basic break-down of the overall costs of materials for the IG testing as well as a $/foot value for each gallery. Labor should be considered in the construction of these galleries, particularly if numerous galleries were installed around a watershed. It is estimated that labor costs were significantly higher for the IG-3 and IG-4 with the *Raintanks* taking approximately 60 man-hours. Exact labor and materials costs will differ by region and supplier; an extensive analysis was not undertaken for this report.

Infiltration Galleries Materials	Total Material Costs (2008)	Cost/infiltration Area ($/foot)
Inlet Structure	$4,300	n/A
Mainline Pipe	$14,200	n/A
Main Value Structure	$3,330	n/A
IG #1 Perforated Pipe	$2,211	$3.32
IG #2 Drain Tile (septic)	$2,274	$3.41
IG #3 Stormtech Chambers	$7,764	$7.15
IG#4 Atlantis Rain Tanks	$10,078	$10.00
Total	$44,157	

Table 7 General costs breakdown for Infiltration Galleries (does not include gravel).

Summary of Infiltration Gallery Testing and Recommendations

Infiltration gallery testing includes not only the physical monitoring and water quality monitoring of various gallery designs but also the process by which they are permitted for operations. The HBDIC recharge team was successful in obtaining UIC permits for the testing site which coupled with the OWRD limited testing license allowed the system to be built for testing. Initial results on recharge rates show that these galleries have the potential to recharge considerable amounts of water if spaced sufficiently from other areas where surface water is infiltrating (e.g. ditches, ponds or natural water bodies). Issues with pipe sizing, meter failures and site placement limited the independent testing results of the galleries. However even with these issues all the galleries will provide long-term clogging information to the HBDIC team over the life of the testing project. Recharge notes do not appear to have varied greatly between the various materials; however the limitations mentioned previously make any firm predictions tenuous. When funding is secured, it is recommend that the faulty flow meter (IG-2) and the limiting 5" feeder pipes (IG-3 and 4) are replaced so that actual flow rates and volumes can be accurately recorded over the next 5 years of the limited testing license. Establishing the TSS to Turbidity Meter rating curve and keeping careful records of operation times, rates and volumes is critical to better assess the most critical issue, clogging.

PART IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Results

The HBDIC recharge site has been operated for six recharge seasons totaling 602 days of operations. On-site recharge spreading basins and infiltration galleries have recharged the aquifer with more than 13,500 acre-feet of water, which represents more than 21 square-miles a foot deep of water. The OWRD limited testing license that the HBDIC Site operates under (LL-1159) requires that ditch conveyance losses be included under the 50 cfs maximum use quantity, taking the projects total recharged volume to 25,000 acre-feet (40 square-miles a foot deep of water.) Onsite recharge rates have varied by year depending on the water year availability and the infiltration area with *effective average* values between 5.7 to 15 cfs. Basin clogging and water table recovery may also be acting to slightly reduce the surface infiltration rates on site.

Water quality monitoring performed at the site has shown an ambient low-level fecal coliform contamination in the surface water and surrounding shallow aquifer system. Surface water to groundwater treatment through recharge activities may indicate that natural attenuation processes are applicable for the HBDIC site operations. General chemistry results showed no significant findings while only two low-level detections were made of any Soluble Organic Compounds (e.g. pesticides, etc) during this testing period. Water quality of both the source water and groundwater appear to be stable and predictable during the recharge season. Recharge did not degrade groundwater quality.

WWBWC monitoring wells have helped track the recharged water as it moved into the groundwater system. Pressure perturbations directly linked to HBDIC recharge activities were used to track the recharge influence on groundwater response and to down-gradient springs. The springs were showing recovery when compared directly to historic flows recorded during the 1930s and 1940s. From these results the WWBWC-HBDIC team believes the HBDIC recharge site has been successfully testing aquifer recharge and is recharging a portion of the shallow aquifer system. The benefits of groundwater recovery while helping to restore historic spring flows also appear to be linked to HBDIC recharge site operations (**Figure** 64). We believe these results provide the basis by which to pursue the Bi-state ARSR program outlined in the following section of this document.

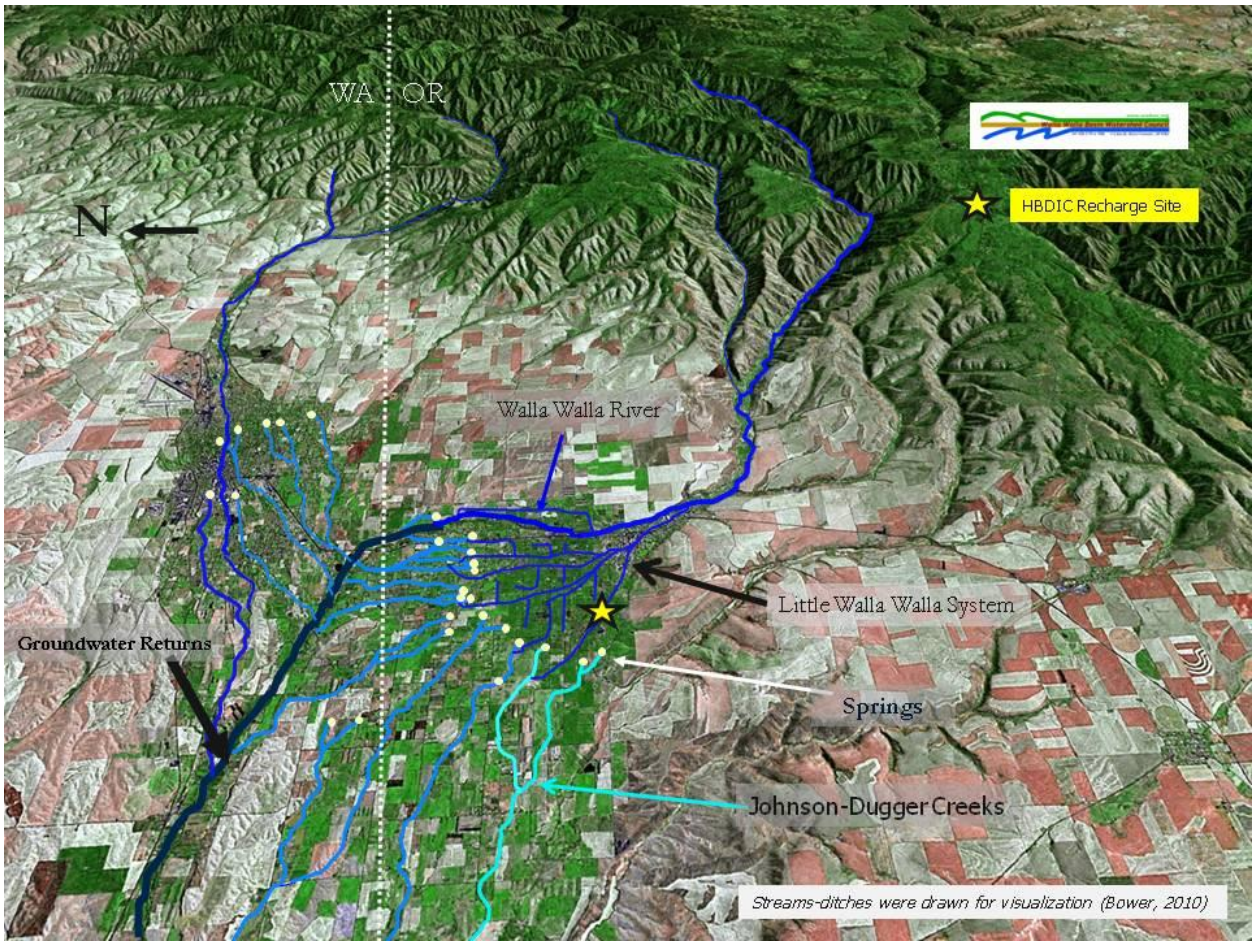


Figure 64. Walla Walla River Basin springs and groundwater returns to the Walla Walla River.

Managed Aquifer Recharge – Balancing Storage

The results of testing at the HBDIC site indicate that MAR can be a useful water management tool in the Walla Walla basin. When considering numerous historical as well as new stresses that face the storage of water in the shallow aquifer system, MAR should be considered (**Figure** 65). Other options currently being considered include surface water storage behind dams, large pumping exchanges with the Columbia River and/or curtailment of existing water rights, both irrigation and domestic. Some of these other options require hundreds of millions of dollars while others threaten political polarization of the community. None of the options in themselves can guarantee that the balance of water in this highly interconnected surface-groundwater system will be sustainable for fish and people into the future.

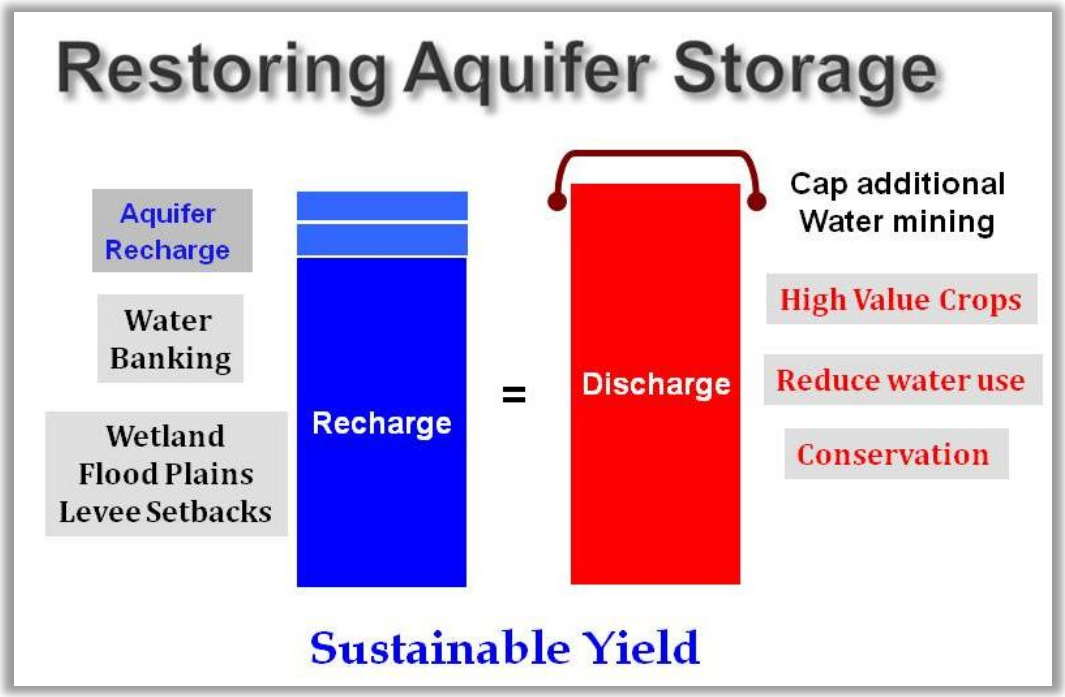


Figure 65. Balancing Storage with Managed Aquifer Recharge and other methods.

Managed Aquifer recharge has shown positive results toward being a water management tool for the Walla Walla Basin. As a tool it can be used as it is designed and for nothing more. Other water management strategies that could ensure better management includes restoring wetlands, river and creek flood plains through levee setback projects. Slowing water down after decades of making it move faster through the basin seems the best strategy as these activities also improve the habitat of wildlife and increase the quality of life of the residents of the basin. As supplies of water decrease the value of water will increase, making it more useful to buy and sell water (water banking) or utilizing it with crops of higher commercial value. Finally, using less water through conservation is always the least expensive alternative to all of the above mentioned and should be part of the overall Walla Walla basin strategy.

Moving Forward: From Testing to Programmatic Response

The operations, analysis, and modeling of the HBDIC Recharge testing site coupled with the information collected at the other 2 Walla Walla basin's recharge sites has provided critical answers to the most pressing questions about aquifer recharge for this basin, including;

1. Aquifer recharge has been shown to effectively transfer seasonally available surface water into the shallow aquifer for the purposes of storage
2. Aquifer recharge has been shown to help restore flows in historical springs that are tributaries to steelhead and redband trout creeks
3. Source water used for aquifer recharge should be shown to have good and consistent quality

4. Aquifer properties have been measured showing this system can provide a viable water storage
5. Continued piping coupled with over-allocated well pumping without mitigation will result in continued spring declines and threatens to jeopardize instream flows throughout the system.

The information generated by this monitoring along with applied research conducted by the WWBWC and its partners has led to vast improvements in our understanding of groundwater conditions and characteristics. Complementing our scientific understanding of the hydrology within the Walla Walla basin, the WWBWC and its partners have also been moving forward with policy development for the Aquifer Recharge and Spring Restoration (ARSR) program. Supporting this effort, in 2009 the State of Washington passed legislation creating the Walla Walla Watershed Management Partnership.[20] The Partnership is a public agency operating under RCW 90.92 (2SHB 1580, Chapter 183, Session Laws of 2009) and is charged with piloting local water management in the Walla Walla Basin. Efforts leading up to the formation of the Partnership were made up of community members including landowners, local governments, conservation groups, tribes, state and federal agencies, and many other entities working to develop local solutions to the unique water issues in the Walla Walla Basin. In Washington, the Partnership integrates local water and watershed management with state oversight, providing a primary governance structure for improved water management and ensuring that local and statewide interests are protected.

In spring 2009, the WWBWC hosted a Bi-state Groundwater Status meeting where hydrogeologists representing both states (OWRD/WDOE) met with WWBWC technical staff and discussed basin monitoring, aquifer trend analysis, and regulatory and enforcement tools by which the system can be better managed. In Washington the shallow aquifer is closed to further irrigation appropriations and has recently restricted the amount of water new exempt wells can utilize. In Oregon the shallow aquifer is still officially open to new well applications. However, new applications are being reviewed under a more detailed evaluation and additional scrutiny.

The WWBWC is also working with Oregon and Washington Water Trusts to create a bi-state water banking system in order to create 'cap-n-trade' mechanism. By creating a water banking system the intent is to create a system where new wells are required to mitigate for their use by purchasing mitigation credits through the Trusts. This system can help create revenue by which to help support the implementation of the ARSR program.

Progressive water management on the Oregon side of the basin is represented in the Umatilla Critical Groundwater Task Force[21] recently completed 2050 Plan[22] and its primary goal:

[20] http://www.wallawallawatershed.org/
[21] http://umatillacounty.net/planning/Groundwater.htm
[22] http://www.co.umatilla.or.us/planning/Groundwater.htm

"… ensure a coordinated, integrated response with maximum use of all water resources and to mitigate the effects of water declines impacting Umatilla County."(Umatilla County CGT, 2009)

This forward thinking plan proposes the creation of water management districts, encouraging the construction and operations of aquifer recharge projects and working to create revenue streams from which funding can be acquired to implement more management projects in Umatilla County. The ARSR goals for the Walla Walla Basin follow those of the Umatilla County plan and have support for further development at the county level.

Water management efforts in both states have been working together to come up with programmatic solutions to addressing this bi-state hydrologic, biologic and economic issue. The Walla Walla Basin Aquifer Replenishment and Spring Restoration Program intends to build on all of these efforts by creating a coordinated bi-state approach to address the legal, design, distribution, timing, habitat, water quality and quantity issues that are anticipated in creating an aquifer and river system that is managed in a sustainable fashion. The overall goal, as illustrated in Figure 66, is to first *stabilize* the declining aquifer and then move toward *recovery* of lost storage.

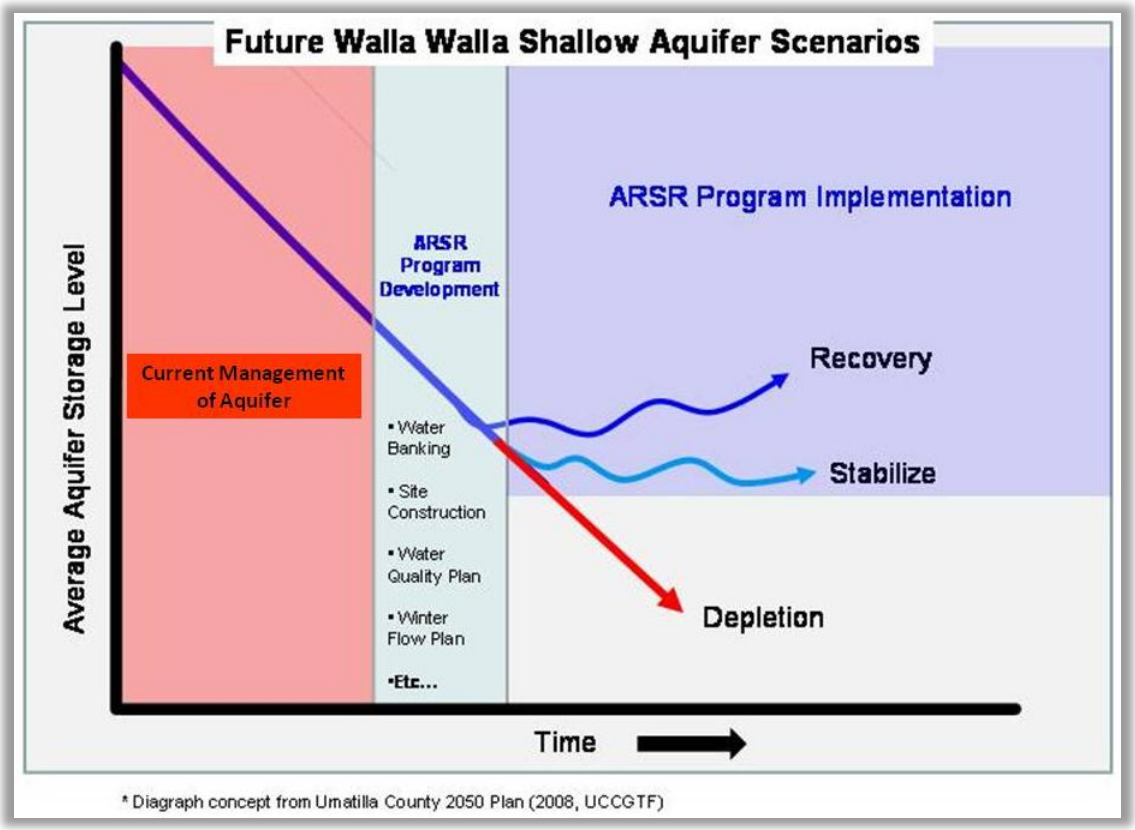


Figure 66. Conceptual Graph depicting goals of ARSR program

The goals of the ARSR program are to:

1. Build adequate recharge capacity to first stabilize and then recover shallow aquifer storage to historic levels**.**
2. Recovered groundwater storage will lead to the recovery of the natural springs which provide cool baseflow back to the Walla Walla River and its distributaries.
3. Whenever possible, refine and enhance current management of surface and groundwater capacities to support goal #1 (e.g. better management of Little Walla Walla River during non-irrigation season)
4. Work with water conservation efforts to design and build water systems that conserve water during times of scarcity and recharge water during times of abundance
5. Educate the general public on the complexity of surface water-groundwater management in the Walla Walla Valley

This ambitious program will not be done unless the WWBWC and its partners pursue its creation and application. There are no state or federal programs that are set up to address this critical issue and without action now, the aquifer and related springs will continue to decline along with the fish and farms that depend on them. This program represents a clear and present need in the Walla Walla basin.

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* Electronic aerial photos of basin provided by: Dr. William Bowen California Geographical Survey (http://geogdata.csun.edu) 10907 Rathburn Avenue Northridge, CA 91326 william.bowen@csun.edu

Appendices Available at:

www.wwbwc.org

541-938-2170

Appendices I-A

HBDIC Recharge Water Quality Testing:

Lab Results, Notes and Records

2004 Recharge Season

Main Identity (HYDRO)

From: "RICHERSON Phil" <Richerson.Phil@deq.state.or.us>
To: "Bob Bower" <bob.bower@wwbwc.org>; "Walla Walla River Irrigation District" <wwrid@qwest.net>; "Tony Justus" <tony.g.justus@wrd.state.or.us>; <Stephen.c.hall@usace.army.mil>; "Rick George" <rickgeorge@ctuir.com>; "Mike Ladd" <michael.f.ladd@wrd.state.or.us>; "Kevin Scribner" <ktscribner@gohighspeed.com>; "Jon Brough" <jon@gohighspeed.com>; "John Zerba" <wahs@bmi.net>; "John Warinner" <warinner@bmi.net>; "John Covert" <jcov461@ecy.wa.gov>; "Jim Chambers" <Jim.R.CHAMBERS@WRD.State.or.us>; "Gary James" <garyjames@ctuir.com>; "Donn Miller" <Donn.W.MILLER@wrd.state.or.us>; "Chris J Hyland" <chris.j.hyland@nww01.usace.army.mil>; "Brian Wolcott" <brian.wolcott@wwbwc.org>; "Brian Mayer OWRD-Wells Inspector" <brian.m.mayer@wrd.state.or.us>; "Bill Neve" <wnev461@ecy.wa.gov>; "Dan Evans GTH-Law" <devans@gth-law.com>
Cc: "WOLGAMOTT Mitch" <WOLGAMOTT.Mitch@deq.state.or.us>
Sent: Monday, April 19, 2004 8:32 AM
Subject: RE: Update

Bob,
After talking with my manager and several colleagues, we feel it would be OK to continue the recharge project for now, as long as fecal coliform is the only contaminant being detected in the source water and it is not being detected in the downgradient compliance wells. It would probably be a good idea to get the total count on the source water. The detection of pesticides in the source water would likely need to be handled differently. Please keep me up to date on your analytical (and hydrologic) results.
Thanks,
Phil Richerson
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Phil Richerson
Nonpoint Source Hydrogeologist
Oregon Department of Environmental Quality
700 SE Emigrant, #330
Pendleton, OR 97801
(541) 278-4604
(541) 278-0168 fax
Richerson.Phil@deq.state.or.us

-----Original Message-----
From: Bob Bower [mailto:bob.bower@wwbwc.org]
Sent: Monday, April 19, 2004 9:15 AM
To: Walla Walla River Irrigation District; Tony Justus; Stephen.c.hall@usace.army.mil; Rick George; RICHERSON Phil; Mike Ladd; Kevin Scribner; Jon Brough; John Zerba; John Warinner; John Covert; Jim Chambers; Gary James; Donn Miller; Chris J Hyland; Brian Wolcott; Brian Mayer OWRD-Wells Inspector; Bill Neve; Dan Evans GTH-Law
Subject: Update
Importance: High

Greetings,

Well a mixed bag of information this morning. I will start with the down side:

Kuo testing sent us notice that the water quality samples we took last week produced a PRESENT hit for Fecal Coliforms. The observation well we were also measuring was **negative** for the same test, which is really good news. After talking with Phil Richardson (DEQ), the best course of action is to shut the project down and re-test the sample water and well water. I will drive this morning and get the bottles and sample the water this afternoon. We should have results by weeks end. I have shut down the project as of this am.

The **good news** is that all three ponds have been completed and the aquifer (downloaded monitoring wells
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

this am) were continuing to climb. I also drove down to the headwaters of Johnson Creek, which for as long as I can remember has been dry, there was **water in the creek** bottom this morning.

I have to say I am a bit disappointed in the positive hit for fecals. Things were moving along so well. We will resample and see where that takes us. All of the other tests we have done thus far have been "no detection" so this is the first major road block in the project. A total count will provide a lot more information. I have ordered several to make sure we have QA/QC.

I will of course keep you all posted.

Bob Bower

Bob Bower

From: "Bob Bower" <bob.bower@wwbwc.org>
To: "Walla Walla River Irrigation District" <wwrid@qwest.net>; "Tony Justus" <tony.g.justus@wrd.state.or.us>; <Stephen.c.hall@usace.army.mil>; "Rick George" <rickgeorge@ctuir.com>; "Phil Richerson" <RICHERSON.Phil@deq.state.or.us>; "Mike Ladd" <michael.f.ladd@wrd.state.or.us>; "Kevin Scribner" <ktscribner@gohighspeed.com>; "Jon Brough" <jon@gohighspeed.com>; "John Zerba" <wahs@bmi.net>; "John Warinner" <warinner@bmi.net>; "John Covert" <jcov461@ecy.wa.gov>; "Jim Chambers" <Jim.R.CHAMBERS@WRD.State.or.us>; "Gary James" <garyjames@ctuir.com>; "Donn Miller" <Donn.W.MILLER@wrd.state.or.us>; "Dan Evans GTH-Law" <devans@gth-law.com>; "Chris J Hyland" <chris.j.hyland@nww01.usace.army.mil>; "Brian Wolcott" <brian.wolcott@wwbwc.org>; "Brian Mayer OWRD-Wells Inspector" <brian.m.mayer@wrd.state.or.us>; "Bill Neve" <wnev461@ecy.wa.gov>; "Tom Darnell" <Thomas.Darnell@orst.edu>
Cc: "WOLGAMOTT Mitch" <WOLGAMOTT.Mitch@deq.state.or.us>; "Stephanie Eaton" <stephanie.eaton@wwbwc.org>; "Gina Massoni" <gina.massoni@wwbwc.org>; "Eric Pfeifer" <pfeifdog@whitties.org>; "Rivera Chris" <chris.rivera@wwbwc.org>; "Brian Wolcott" <brian.wolcott@wwbwc.org>; "Bob Chicken" <bob.chicken@wwbwc.org>; "Bob Bower" <Bob.bower@wwbwc.org>
Sent: Thursday, April 22, 2004 11:34 AM
Subject: WQ update

Good morning,

Some news on the recharge site (left voice mail with Phil).

After our fecal coliform hit at the intake site (ditch water) last week, I did a battery of fecal and E. coli (CFU counts) samples on:

(1) Intake (ditch water)
(2) Well 1 (downgradient obs well, influenced by project water)
(3) Well 3 (upgradient control well).

I just received the results this am (via phone and fax):

Recharge Intake was **fecal 40 cfus, E. Coli 24.1 (cfus = colony forming units per 100 ml)**
Well # 1 **fecal 3.1 cfus, E. Coli 2.0**
Upgradient control Well # 3 **fecal 14.8, E. Coli 7.5**

In my opinion this is what I believe is going on (knowing that this a very small sample size).

We know that the ditch by itself brought up the aquifer ~20 feet **before** we turned on the recharge project. I would guess that the ditch is the main vector for movement of the bacteria based on reported concentrations and the aquifer static being dramatically influenced by the ditch without the project being on. I would say that the problem may be background all along the ditch back to where ever the source is. I have 12 more fecal/e. coli concentration (cfus) tests ordered (here Monday) that I was going to use to move back up gradient of the site and test both ditch and wells along the way. I would also take three samples from Well #1 (recharge influenced) ~ throughout a 24 hour period, to see if this is an episodic plume type event. whenever sample well 1, sample #3

As I told Phil on the phone, hind site is 20-20. We have WQ samples for the conditions before the ditch was on, and after the ditch AND the recharge project were running. What we missed was a WQ sample with JUST the ditch on, which would provide us with a better background condition for the recharge operation. We can capture that when we turned off the project and sample before the ditch goes off. One thing we can definitely refine for next year's recharge season.

In my thesis work in the Tillamook watershed, we saw that septic related feces in river/streams appeared to trend with time of day. Early morning and evenings when people are home, using their toilets, showers, etc. Certainly

with the nature of our substrate here and how quickly water moves, that would seem a logical guess for our valley as well. Fecal bacteria are enteric (intestinal tracks) and are not very fond of a climate outside of the 96 degrees F range. As all our samples are early morning, it makes sense we might be capturing a daily upgradient septic plume. Of course, I need a lot more information before I can start shoring up theories like these. Also one thing I learned from that work was how variable FC and E.Coli concentrations could be even between samples collected at the same time, so concentrations from just a few samples are always something to use carefully.

****

So to clarify what I would propose to move forward with as our **sampling plan:**

Set 1:

12 additional fecal/e.coli cfus tests (this next early Monday)

Questions: Is this fecal presence background conditions? Does it come from areas around ditch or WW River?

Period: early morning

2 samples in ditch moving back upgradient toward WW River
4 on site samples (intake, well 1 (x 2 for 10 % repeatability QA/QC) and control well 3)
3 samples in upgradient wells (we have several I could use staggered up along the ditch) (Hypothesis: fecals are back ground to this system).

Question: Chronic or episodic fecal events?

Period: 24 hour period (Wednesday next week)

4 samples at well #3 through out the rest of a 24 hour period (about 8 hours apart, 1 extra at Well 1 for 10% QA/QC repeatability). Give us more information on the idea of if this is a chronic condition or episodic events.

Set 2:

Question: Is this fecal presence persistent? Does it get worse/better?

Period: 2-3 days

CFU samples (fecal/e.coli) at OBS well 3 until end of project.

(*** and possibly more fecal depending on results from Set 1 sampling)

Final Set 3:

Question: Is this a background condition associate with common ditch operations?

Period: 2-3 days after project offline, ditch still running full.

Full set of analytes and FC cfu testing at Intake and Well #1

JUST FC cfu at Well #3

****

Thoughts, concerns or questions?

We get our EPA analyte results late Friday, I will keep you all posted.

Cheers,

Bob Bower

Fecal Coliform testing

Surface

FC-1 Frog @ 7:50 am
4/29/4
temp = 6.3°C
NS = 52.7

FC-2 @ Winesap
@ 8:06
4/29/4
temp = 6.5
NS = 53.1

FC-3 Intake
time 9:30 am
4/29/4
NS = 52.9
temp = 7.4

Wells

FC-3 GW 40
(Gravel - handdug well @ Edwards / County Rd)
4/29/4
8:20 am
NS = 73.0
temp = 10.6
used sterile evabailer
static 35' + 9"
from TOC

FC-4a GW 47
4/29/4
9:35
NS = 79.1
temp = 14.0
static = 25'

Sterile evabailer
Duplicate sample (gA/gc)
FC-4b
taken same time

FC-5 OBS Well #1
GW-48
4/29/4
time 9:12 am
static: 20' + 8" NS = [illegible]
temp 13.0

Wells Manitoulin

FC-7
Huelette Irrigation well GW39
4/29/4
9:50 am
NS = 128.7
temp = 13.8
static = 35' + 27"

FC-8
old Johnson house (County Rd. Downgradient
4/29/4
10:30
NS = 276.4
temp = 16.2
static = 35' - 4"

Kuo Testing Labs, Inc.

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(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
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DATE COLLECTED: 5/21/2004
DATE RECEIVED: 5/21/2004
DATE REPORTED: 6/2/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70881	OBS Well #1	COD	11	8	mg/L	Qian
70881	OBS Well #1	TKN as Nitrogen	<0.72	0.72	mg/L	Qian
70881	OBS Well #1	Chloride	ND	0.03	mg/L	Qian
70881	OBS Well #1	Orthophosphate as P	0.20	0.037	mg/L	Qian
70881	OBS Well #1	Total Dissolved Solids	<20.3	20.3	mg/L	Qian

CHLORIDE

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit

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Dr. Eugene Kuo, Quality Assurance Coordinator

06-09-04
Date

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DATE COLLECTED: 4/13/2004
DATE RECEIVED: 4/14/2004
DATE REPORTED: 4/23/2004
SEND REPORT TO:

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	DESCRIPTION	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70295	Well #1	Chloride	N/D	0.297	mg/L	Qian
70295	Well #1	TKN as Nitrogen	<0.72	0.72	mg/L	Qian
70295	Well #1	Total Dissolved Solids	<20.3	20.3	mg/L	Qian
70295	Well #1	Orthophosphate as P	0.19	0.037	mg/L	Qian
70295	Well #1	COD	55	8	mg/L	Qian

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Mallydan for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 23, 2004
Date

Kuo Testing Labs, Inc.

337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE #	04-04-348
INVOICE DATE	04/23/04
CLIENT #	WWB2170
PURCHASE ORDER#	

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70291	04/14/04	Intake,Well #1	A17-1	Ortho-P	2	25.00	50.00
E70291	04/14/04	Intake,Well #1	A18-5	Dissolved Solids	2	25.00	50.00
E70291	04/14/04	Intake,Well #1	A2-4	TKN	2	35.00	70.00
E70291	04/14/04	Intake,Well #1	A8	COD	2	32.00	64.00
E70291	04/14/04	Intake,Well #1	A9-2	Chloride	2	18.00	36.00

Notes: 04-04-348

Invoice Total	270.00
Discount 0 %	-0.00
FAX Charge	0.00
Invoice Total Due	$270.00
Due Date	05/23/04

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

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DATE COLLECTED: 4/13/2004
DATE RECEIVED: 4/14/2004
DATE REPORTED: 4/23/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70295	Well #1	Chloride	N/D	0.297	mg/L	Qian
70295	Well #1	TKN as Nitrogen	<0.72	0.72	mg/L	Qian
70295	Well #1	Total Dissolved Solids	<20.3	20.3	mg/L	Qian
70295	Well #1	Orthophosphate as P	0.19	0.037	mg/L	Qian
70295	Well #1	COD	55	8	mg/L	Qian

<0.001): indicates the analyte was not detected at or above the concentration indicated.
None Detected
L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Molly Lin for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 23, 2004
Date

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W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70291	Intake	COD	21	8	mg/L	Qian
70291	Intake	Total Dissolved Solids	<20.3	20.3	mg/L	Qian
70291	Intake	TKN as Nitrogen	<0.72	0.72	mg/L	Qian
70291	Intake	Chloride	N/D	0.297	mg/L	Qian
70291	Intake	Orthophosphate as P	0.21	0.037	mg/L	Qian

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Molly Lee for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 23, 2004
Date

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70295	Well #1	COD	55	8	mg/L	Qian

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Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70291	Intake	COD	21	8	mg/L	Qian
70291	Intake	Total Dissolved Solids	<20.3	20.3	mg/L	Qian
70291	Intake	TKN as Nitrogen	<0.72	0.72	mg/L	Qian
70291	Intake	Chloride	N/D	0.297	mg/L	Qian
70291	Intake	Orthophosphate as P	0.21	0.037	mg/L	Qian

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Molly Kuo for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 23, 2004
Date

Orig. 6/1/04 Sent to Guy

Kuo Testing Labs, Inc.

337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE # 04-04-227
INVOICE DATE 04/16/04
CLIENT # WWB2170
PURCHASE ORDER#

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70053	04/02/04	Well #1	A17-1	Ortho-P	1	25.00	25.00
E70053	04/02/04	Well #1	A18-5	Dissolved Solids	1	25.00	25.00
E70053	04/02/04	Well #1	A2-4	TKN	1	35.00	35.00
E70053	04/02/04	Well #1	A8	COD	1	32.00	32.00
E70053	04/02/04	Well #1	A9-2	Chloride	1	18.00	18.00

Notes: 04-04-227

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

Invoice Total		135.00
Discount	0 %	-0.00
FAX Charge		0.00
Invoice Total Due		$135.00
Due Date		05/16/04

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/2/2004
DATE RECEIVED: 4/2/2004
DATE REPORTED: 4/14/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70053	Well #1	COD	20	8	mg/L	Qian
70053	Well #1	TKN as Nitrogen	<0.72	0.72	mg/L	Qian
70053	Well #1	Chloride	ND	0.72	mg/L	Qian
70053	Well #1	Orthophosphate as P	0.206	0.037	mg/L	Qian
70053	Well #1	Total Dissolved Solids	<20.3	20.3	mg/L	Qian

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Mollylin for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 14, 2004
Date

VALLEY Environmental Laboratory

Washington State Certified Lab #153 - DOE Accredited Lab C345

Please File Under: WWBWC

Fecal Coliform / E. coli

Lab/Sample No: Below	Date Collected: 04/20/04	
Date Received: 04/20/04	Date Reported: 04/21/04	Supervisor: DCR
Sample Location:		Invoice#: 2033

Send Report To:
KUO Testing Labs, Inc
337 South 1st
Othello, WA 99344

Sample Information Matrix: Water
70358 - Intake
70359 - Well #1
70360 - Well #3

Fecal Coliform / E. coli Intake Well #1 Well #3

VEL Sample Number:		15342008	15342009	15342010				
Sample ID/Location:		70358	70359	70360				
Analyte	Units	Results	Results	Results			Method	Date Analyzed	Analyst
Fecal Coliform	CFU/100mL	40.0	3.1	14.8			SM 9222D	04/21/04	BKO
E. Coli	MPN/100mL	24.1	2.0	7.5			SM 9223B	04/21/04	BKO

FECALS

MRL (Method Reporting Level): Indicates the minimum reporting level required and obtained by the laboratory (always > MDL).

Trigger: DOH Drinking Water response level.

MCL (maximum contaminant level): Highest level recommended by the federal government for public water systems.

ND (Not Detected): Indicates this compound was analyzed and not detected at a level greater than or equal to the MRL.

Approved By:

42008-fcec

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

To Phil
Richardson
OPEQ

DATE COLLECTED 4/20/2004

DATE RECEIVED 4/20/2004

SEND REPORT TO

DATE REPORTED 4/22/2004

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CLIENT SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
70358	Intake	Fecal Coliform	40.0	2	MPN/100ml	Valley Labs
70358	Intake	Fecal E-Coli	24.1	2	MPN/100ml	Valley Labs

<(0.001): Indicates the analyte was not detected at or above the concentration indicated
ND. None Detected
mg/L:Indicates milligrams per litre
* PQL-Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL. Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Melissa for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 22, 2004
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/20/2004
DATE RECEIVED: 4/20/2004
DATE REPORTED: 4/22/2004
SYSTEM / CUSTOMER #:
SEND REPORT TO:

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
70359	Well #1	Fecal Coliform	3.1	2	MPN/100ml	Valley Labs
70359	Well #1	Fecal E-Coli	2.0	2	MPN/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Molly Kuo for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 22, 2004
Date

Kuo Testing Labs, Inc.

337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE #	04-04-320
INVOICE DATE	04/23/04
CLIENT #	WWB2170
PURCHASE ORDER#	

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70358	04/20/04	Intake,Well #1,Well #3	FECAL	Fecal Coliform	3	67.50	202.50

Notes: 04-04-320

Invoice Total		202.50
Discount	0 %	-0.00
FAX Charge		0.00
Invoice Total Due		$202.50
Due Date		05/23/04

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/20/2004
DATE RECEIVED: 4/20/2004
DATE REPORTED: 4/22/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70358	Intake	Fecal Coliform	40.0	2	MPN/100ml	Valley Labs
70358	Intake	Fecal E-Coli	24.1	2	MPN/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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Please check out our new Web Site at ***http://www.kuotesting.com***

Mollyann for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 22, 2004
Date

EDGE ANALYTICAL
The lab you can trust!

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

QUALITY CONTROL REPORT
BLANK REPORT

Reference Number: 06-06951
Report Date: 12/12/06

Batch	Analyte	Result	Units	Limit	QC Qualifier	Method	Type*	Comments
COD_060609	CHEMICAL OXYGEN DEMAND	ND	mg/L	4.00		SM5220 D	LRB	
I060602A	CHLORIDE	ND	mg/L	0.10		300.0	LRB	
TDS_060607	TOTAL DISSOLVED SOLIDS	ND	mg/L	10.00		SM2540 C	LRB	
TKN-060621	TOTAL KJELDAHL NITROGEN	ND	mg/L	1.00		SM4500-Norg C	LRB	
TKN-060621	TOTAL KJELDAHL NITROGEN	ND	mg/L	0.12		SM4500-Norg C	MB	

*Notation:

LRB: Laboratory Reagent Blanks are used to determine the background level of the analytes in a laboratory batch. Therefore, this report may include analytes not requested for your submitted samples.

MB: Method Blanks are used to determine background levels of analytes in digested and extracted laboratory reagent water.

EDGE ANALYTICAL
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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

QUALITY CONTROL REPORT
QCS/LFB REPORT

Reference Number: 06-06951
Report Date: 12/12/06

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
COD_060609	CHEMICAL OXYGEN DEMAND	48	50	mg/L	SM5220 D	96	80-120		LFB	
TDS_060607	TOTAL DISSOLVED SOLIDS	474	500	mg/L	SM2540 C	95	80-120		LFB	
	TOTAL DISSOLVED SOLIDS	482	500	mg/L	SM2540 C	96	80-120		LFB	
TKN-060621	TOTAL KJELDAHL NITROGEN	4.06	4.00	mg/L	SM4500-Norg C	102	80-120		LFB	
TKN-060621	TOTAL KJELDAHL NITROGEN	4.00	4.00	mg/L	SM4500-Norg C	100	80-120		LFB	
COD_060609	CHEMICAL OXYGEN DEMAND	120	127	mg/L	SM5220 D	94	80-120		QCS	
I060602A	CHLORIDE	29	30	mg/L	300.0	97	80-120		QCS	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

FORM: cLFB

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 06-06951
Report Date: 12/12/2006

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
COD_060609									
I060602A									
	14252	CHLORIDE	13	13	mg/L	0.0	0-45	DUP	
TDS_060607									
	14154	TOTAL DISSOLVED SOLIDS	278	286	mg/L	2.8	0-45	DUP	
	14243	TOTAL DISSOLVED SOLIDS	210	207	mg/L	1.4	0-45	DUP	
TKN-060621									
	14174	TOTAL KJELDAHL NITROGEN	146	150	mg/L	2.7	0-45	DUP	
	14583	TOTAL KJELDAHL NITROGEN	1.20	1.28	mg/L	6.5	0-45	DUP	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Reference Number: 06-06951
Report Date: 12/12/2006

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
COD_060609														
	14226	CHEMICAL OXYGEN DEMAND	ND	52	48	50	mg/L	104	96	80-120	8.0	0-60	LFM	
I060602A														
	14146	CHLORIDE	ND	1.1		1.00	mg/L	110	NA	80-120	NA	0-60	LFM	
TKN-060621														
	14175	TOTAL KJELDAHL NITROGEN	7.74	11.5		4.00	mg/L	94		80-120	NA	0-60	LFM	
	14675	TOTAL KJELDAHL NITROGEN	7.94	12.4		4.00	mg/L	112		80-120	NA	0-60	LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Kuo Testing Labs, Inc.
337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE # 04-05-074
INVOICE DATE 05/07/04
CLIENT # WWB2170
PURCHASE ORDER#

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70498	04/30/04	FC-1, Frog,FC-2. Winesap Rd.,FC-3, Well GW-40,FC-4b OBS Well #3,FC-5 OBS Well #1,FC-7 GW-39,FC-8 GW-60 (John),GW-47 OBS Well #3,Intake,OBS Well #1 9:35P,OBS Well #1 6:40A,OBS Well #3 9:00P,OBS Well#3 6:30A	FECAL	Fecal Coliform	13	67.50	877.50

Notes: 04-05-074

Invoice Total		877.50
Discount	0 %	-0.00
FAX Charge		0.00
Invoice Total Due		$877.50
Due Date		06/06/04

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70498	FC-1, Frog	Fecal Coliform	12.2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

Kuo Testing Labs, Inc.

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DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70499	FC-2. Winesap Rd.	Fecal E-Coli	4.1	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
MG/L:Indicates milligrams per litre
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05-04-04
Date

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70500	FC-3, Well GW-40	Fecal E-Coli	<1	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

Fc-4b, Obswell 3

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70501	FC-4b, OBS Well #3	Fecal E-Coli	3.1	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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MDL: Method Detection Limit
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70502	FC-5, OBS Well #1	Fecal E-Coli	11.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit

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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

Kuo Testing Labs, Inc.

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70503	FC-7, GW-39	Fecal E-Coli	<1	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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MDL: Method Detection Limit
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

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(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70504	FC-8, GW-60 (John)	Fecal E-Coli	<1	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

GW-47, Obswell 3

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/29/2004
DATE RECEIVED: 4/30/2004
DATE REPORTED: 5/4/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70505	GW-47, OBS Well #3	Fecal E-Coli	2.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
L:Indicates milligrams per litre
QL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70506	Intake	Fecal E-Coli	1.0	2	CFU/100ml	Valley Labs

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None Detected
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70507	OBS Well #1, 9:35p	Fecal E-Coli	5.2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
MG/L:Indicates milligrams per litre
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70508	OBS Well #1, 6:40a	Fecal E-Coli	9.7	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70509	OBS Well #3, 9:00p	Fecal E-Coli	3.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
L:Indicates milligrams per litre
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PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE ID	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70503	FC-7, GW-39	Fecal E-Coli	<1	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70504	FC-8, GW-60 (John)	Fecal E-Coli	<1	2	CFU//100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated
ND: None Detected
mg/L: Indicates milligrams per litre
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MDL: Method Detection Limit
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
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Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70505	GW-47, OBS Well #3	Fecal E-Coli	2.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SYSTEM / CUSTOMER

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PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70506	Intake	Fecal E-Coli	1.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L Indicates milligrams per litre
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Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70507	OBS Well #1, 9:35p	Fecal E-Coli	5.2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L Indicates milligrams per litre
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E H Kuo

Dr. Eugene Kuo, Quality Assurance Coordinator

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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70508	OBS Well #1, 6:40a	Fecal E-Coli	9.7	2	CFU/100ml	Valley Labs

<(0.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70509	OBS Well #3. 9:00p	Fecal E-Coli	3.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L Indicates milligrams per litre
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SYSTEM / CUSTOMER:
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PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70510	OBS Well#3, 6:30a	Fecal E-Coli	5.2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
70498	FC-1, Prog	Fecal Coliform	12.2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
70499	FC-2. Winesap Rd.	Fecal E-Coli	4.1	2	CFU/100ml	Valley Labs

<=(0.001). indicates the analyte was not detected at or above the concentration indicated.
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70500	FC-3, Well GW-40	Fecal E-Coli	<1	2	CFU/100ml	Valley Labs

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mg/L:Indicates milligrams per litre
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Milton Freewater OR 97862
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Milton Freewater OR 97862
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70502	FC-5, OBS Well #1	Fecal E-Coli	11.0	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
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Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
70501	FC-4b, OBS Well #3	Fecal E-Coli	3.1	2	CFU/100ml	Valley Labs

<(0.001) indicates the analyte was not detected at or above the concentration indicated.
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-04-04
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue
Othello, WA 99344
509-488-0112
Fax: 509-488-0118 or 509-488-6865

Date: 5/4/04

To: Bob Bower Fax No: _____

From: mary

Subject: _____

Message: _____

Number of Pages to Follow: _____ Pages

Return Fax No: 509-488-0118 or 509-488-6865

If Problems with Transmission, Call 509-488-0112

Kuo Testing Labs, Inc.

337 South 1st Avenue Othello, WA 99344
(509)488-0112 (800)328-0112 Fax (509)488-0118 Web Site http://www.kuotesting.com

INORGANIC CHEMICALS (IOCS) REPORT FOR NITRATES

Type of System: **Individual**

Water System/Customer Name: **W.W.B.W.C.** PWS ID No.:**41**

System Address **PO Box 68**

CITY **Milton Freewater** County **Umatilla** ZIP **97862**

Sample Location: **Intake**

Date Collected: **4/13/2004** *Date Received:* **4/14/2004** *Date Analyzed:* **4/15/2004**

Laboratory No.:WA060-70290 *Date Reported:* **4/15/2004**

Party To Pay for Testing: **W.W.B.W.C** Send Results to: **Bob Bower**

PO Box 68 **PO Box 68**

Milton Freewater OR 97862 **Milton Freewater OR 97862**

Contaminant - Method	Code	MCL mg/L	Analyst	Analysis mg/L
Nitrate (NO3- N)SM4500-NO3-D	1040	10.	Qian	ND
Nitrite (NO2-N)SM4500-NO2-B	1041	1.0		
Nitrite + Nitrate	1038	10.		

NOTES:

MCL (Maximum Contaminant Level): if the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA (Not Analyzed): in the results column indicates this compound was not included in the current analysis.

ND (Not Detected): in the results column indicates thie compound was analyzed and not detected at a level greater than or equal to the value shown.

mg/L: indicates milligrams per liter or parts per million.

<0.100: indicates the compound was detected but at a value below the concentration indicated.

Comments: See our new Web Site at **http://www.kuotesting.com**

Mallyeun for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 15, 2004
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue
Othello, WA 99344
509-488-0112
Fax: 509-488-0118 or 509-488-6865

Date: 10/28/03

To: Bob Fax No: _____

From: Renay

Subject: _____

Message: If you have any questions please call. Thank You

Number of Pages to Follow: _____ Pages

Return Fax No: 509-488-0118 or 509-488-6865

If Problems with Transmission, Call 509-488-0112

Agricultural Industrial Environmental

KUO TESTING LABS, INC 337 South 1st, Othello, Washington 99344 Tel: (509) 488-0112 Fax: (509) 488-0118

Dear Bob,

Sorry it has taken so long to get you this list, but we were waiting for the other lab, and they just faxed it to me today. This is a list of what the lab can do, the method and the price. Pricing assumes standard ten to fourteen working day turnaround time.

Analysis	Method	Price
Trifloxystrobin, Water or Soil	Modified EPA 8081	$164.70/Ea.
Triadimefon and Triflumazole, Water or Soil	Modified EPA 8270	$191.70/Ea.
Imidicloprid, Water only	Modified EPA 632	$182.25/Ea.
Spinosad, Water only	Manufacturer's Method	$182.25/Ea.

If you have any questions regarding this price quote, please do not hesitate to call.

Sincerely,

Renay Jorgensen

Renay Jorgensen

This analysis is for water only.
The Price is $815.40.

EDGE ANALYTICAL

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number:

Project:

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose:
Sample Location:
County:

Field ID:
Lab Number:
Date Collected:
Date Extracted:
Date Analyzed:
Report Date:
Analyst:
Supervisor: TW

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

* An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
** - Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
*** - If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
**** - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number:

Project:

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose:
Sample Location:
County:

Field ID:
Lab Number:
Date Collected:
Date Extracted:
Date Analyzed:
Report Date:
Analyst:
Supervisor:

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds. A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value

FORM: SOC97

Total pack 815.40

EDGE ANALYTICAL

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number:

Project:

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose:
Sample Location:
County:

Field ID:
Lab Number:
Date Collected:
Date Extracted:
Date Analyzed:
Report Date:
Analyst:
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	0.5	20		
174	AROCLOR 1232	ND	ug/L	0.1	0.5		
175	AROCLOR 1242	ND	ug/L	0.1	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.1	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC87

EDGE ANALYTICAL

Reference Number:
Lab Number:
Report Date:

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAFTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC37

EDGE ANALYTICAL

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number:

Project:

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose:
Sample Location:
County:

Field ID:
Lab Number:
Date Collected:
Date Extracted:
Date Analyzed:
Report Date:
Analyst:
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1.0	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		

* An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
** - Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
*** - If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
**** - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 3/10/2004
DATE RECEIVED: 3/11/2004
DATE REPORTED: 4/9/2004

SYSTEM / CUSTOMER:
W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
69717	Well #2-Recharge Project	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

Should be Well #1

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Molly for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 9, 2004
Date

EDGE ANALYTICAL
11525 Knudsen Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Reference Number: 04-1650

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Project: 69717

Field ID: 69717
Lab Number: 04603328
Date Collected: 3/18/2004
Date Extracted: 508_040331
Date Analyzed: 4/2/2004
Report Date: 4/5/2004
Analyst: CMH
Supervisor:

System Name: Bob Bower (WWBWC)
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: well #2-recharge project (observation well)
County: Umatilla

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.5	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

"ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
- Maximum Contaminant Level. Maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
, if a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur for DOH.
- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL

Reference Number: 04-1650
Lab Number: 04603328
Report Date: 4/2/2004

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, minimum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC07

EDGE ANALYTICAL
11525 Knudsen Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-1650
Project: 69717

System Name: Bob Bower (WWBWC)
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: well #2-recharge project (observation well)
County: Umatilla

Field ID: 69717
Lab Number: 04603328
Date Collected: 3/16/2004
Date Extracted: 515_040331
Date Analyzed: 4/7/2004
Report Date: 4/8/2004
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An entry of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC07

Synthetic Organic Chemicals (SOC's)

(EPA Methods 515.2, 525.2, 531, 547, 549)
Herbicides, Pesticides, Adipate, PAH's, Carbamates, Glyphosate, Paraquat & Diquat

Instructions for Sample Collection

Collection Point

Samples must be collected in the proper number, at the appropriate time and locations, and of the proper volume in order to satisfy the requirements of the Phase II and V Rules. Samples that fulfill these criteria are called compliance monitoring samples. Groundwater and surface water systems should be representative of the source water following treatment (see figure on back of this sheet). Systems that draw water from more than one source and that combine these sources prior to distribution must sample during periods of normal operating conditions. Samples must be collected at the same sampling point each cycle unless conditions make another sampling point more representative. Generally, samples should be taken at the tap on the pipeline before the treated water is sent to the distribution system. Sometimes sampling taps (faucets) are available in the plant laboratory for the water entering the distribution system. If the water system is treating for any organic compounds (i.e. packed tower aeration, granular activated carbon, oxidation, etc.) contact your regional Drinking Water Specialist to locate the proper collection point. You will find the name and telephone number on the back of this sheet.

Bottles must NOT be filled near gasoline cans, gasoline-powered motors, paint cans, lighter fluid, paint strippers, pesticide bottles or exhaust fumes from running engines. Fumes and vapors may contaminate the samples.

SAMPLE COLLECTION

1. If water taps are to be used for sampling, all aerators, strainers, and hose attachments need to be removed. Open the tap and allow the system to flush for about ten minutes or until the water temperature has stabilized, Adjust the flow to about the thickness of a pencil. Position the container under the tap and collect the sample. Introduce the water very gently to reduce agitation and to avoid introducing air bubbles. Fill the bottle so that little or no air space will remain in the bottle after the cap is secured.

2. Collect _____ one-liter bottle(s) at each collection point for method 525.
   Collect _____500 ml bottle(s) at each collection point for method 515.2
   Collect _____100ml bottle(s) at each collection point for method 547
   Collect _____ 250ml plastic bottle(s) at each collection point for method 549
   Collect _____250ml bottle(s) at each collection point for method 531

IMPORTANT: Be careful not to touch or otherwise contaminate the inside of the lid or the lip of the bottle during sampling.

3. All samples need to be kept **cold.** If the samples are to be held for a day or longer prior to shipping, place the bottles in a refrigerator. Once samples are ready to be shipped, add a bag of ice to the cooler. Samples must be received at laboratory within four days of sampling.

4. Insert the completed sample information form (WSI) into a plastic bag and place in cooler.

If you have any questions, please call KUO Testing Labs, Inc. at 509-488-0112 or 541-922-6435

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/13/2004
DATE RECEIVED: 4/14/2004
DATE REPORTED: 4/26/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70296	Well #1	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
): None Detected
mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

04-26-04
Date

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2367
Project: 70296

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 525_040419
Date Analyzed: 4/19/2004
Report Date: 4/26/2004
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	2.2	ug/L	1.3	1.3	6	Field dup 1.7 ppb
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL

Reference Number: 04-2367
Lab Number: 04604660
Report Date: 4/26/2004

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

"- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
"-. Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
"-. If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
"-. Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2367
Project: 70296
Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 531_040415
Date Analyzed: 4/15/2004
Report Date: 4/19/2004
Analyst: TW
Supervisor:

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

Reference Number: 04-2367
Project: 70296
Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 515_040420
Date Analyzed: 4/21/2004
Report Date: 4/26/2004
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level. maximum permissible level of a contaminent in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/13/2004
DATE RECEIVED: 4/14/2004
DATE REPORTED: 4/26/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70296	Well #1	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<(0.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

04-28-04
Date

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2367
Project: 70296

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 525_040419
Date Analyzed: 4/19/2004
Report Date: 4/26/2004
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	2.2	ug/L	1.3	1.3	6	Field dup 1.7 ppb
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
282	4,4-DDD	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
** - Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, MPDAR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
*** - If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
**** - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM SOC#7

EDGE ANALYTICAL

Reference Number: 04-2387
Lab Number: 04804860
Report Date: 4/28/2004

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.3	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level. Maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- Monitoring frequencies may occur per DOH.
****- If a compound is detected > or = to the State Reporting Level, SRL, Specified surveillance
*****- If a compound is detected > or = to the State Reporting Level, SRL, Specified surveillance monitoring frequencies may occur per DOH.
******- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC07

EDGE ANALYTICAL
11925 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2367
Project: 70296
Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 531_040415
Date Analyzed: 4/15/2004
Report Date: 4/19/2004
Analyst: TW
Supervisor:

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

"ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL - Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Limit (SAL) for Unregulated contaminants.
A blank MCL or Gdl. value indicates a level is not currently established.
If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring requencies may occur per DOH.
Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

PDAM: 020207

EDGE ANALYTICAL
11925 Knudsen Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2367
Project: 70296
Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 508_040419
Date Analyzed: 4/19/2004
Report Date: 4/22/2004
Analyst: CMH
Supervisor:

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.3	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

*= An analyte of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**= Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***= If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****= If a compound is detected between the MDL and the SRL, the compound concentration is greater than zero.
*****= Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J = Estimated value.

FORM: SOCS7

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2367
Project: 70296

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Well#1 recharge project
County: Umatilla

Field ID:
Lab Number: 04604660
Date Collected: 4/13/2004
Date Extracted: 515_040420
Date Analyzed: 4/21/2004
Report Date: 4/26/2004
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
136	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
--- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
**- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
***- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC07

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/13/2004
DATE RECEIVED: 4/14/2004
DATE REPORTED: 4/26/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70292	Intake	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

04-26-04
Date

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2366
Project: 70292
Field ID:
Lab Number: 04604659
Date Collected: 4/13/2004
Date Extracted: 531_040416
Date Analyzed: 4/15/2004
Report Date: 4/19/2004
Analyst: TW
Supervisor:

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: intake
County: Umatilla

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

"ND" indicates that the compound was not detected above the Lab's Method Detection Level - MDL.
An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Level - MDL.
--- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
--- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
---. Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value

FORM: SOC97

EDGE ANALYTICAL
11525 Knudsen Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Reference Number: 04-2366

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Project: 70292

Field ID:
Lab Number: 04604659
Date Collected: 4/13/2004
Date Extracted: 508_040419
Date Analyzed: 4/21/2004
Report Date: 4/22/2004
Analyst: CMH
Supervisor: TW

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: intake
County: Umatilla

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.5	0.5		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

"ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL - Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
SRL - If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11526 Knudsen Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Intake
County: Umatilla

Reference Number: 04-2366
Project: 70292
Field ID:
Lab Number: 04604659
Date Collected: 4/13/2004
Date Extracted: 525_040419
Date Analyzed: 4/21/2004
Report Date: 4/22/2004
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLOPENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, MRDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is selected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
**** - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL

Reference Number: 04-2366
Lab Number: 04604659
Report Date: 4/22/2004

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level. maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated Contaminants.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-2366
Project: 70292
Field ID:
Lab Number: 04604659
Date Collected: 4/13/2004
Date Extracted: 515_040420
Date Analyzed: 4/21/2004
Report Date: 4/26/2004
Analyst: CMH
Supervisor:

System Name: WWSWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: intake
County: Umatilla

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

* An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
** - Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
*** If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may apply per DOH.
**** Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC67

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 4/13/2004
DATE RECEIVED: 4/14/2004
DATE REPORTED: 4/26/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70292	Intake	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
None Detected
mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

04-26-04
Date

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: intake
County: Umatilla

Reference Number: 04-2366
Project: 70292
Field ID:
Lab Number: 04604659
Date Collected: 4/13/2004
Date Extracted: 508_040419
Date Analyzed: 4/21/2004
Report Date: 4/22/2004
Analyst: CMH
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.5	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name: WWBWC
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B
Sample Purpose: B
Sample Location: Intake
County: Umatilla

Reference Number: 04-2366
Project: 70292
Field ID:
Lab Number: 04604659
Date Collected: 4/13/2004
Date Extracted: 525_040419
Date Analyzed: 4/21/2004
Report Date: 4/22/2004
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

Kuo Testing Labs, Inc.

337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE #	04-04-361
INVOICE DATE	04/23/04
CLIENT #	WWB2170
PURCHASE ORDER#	

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70292	04/14/04	Intake,Well #1	A26-1	SOC/Synthetic Organic Compounds	2	815.40	1,630.80

Notes: 04-04-361

Invoice Total		1630.80
Discount	0 %	-0.00
FAX Charge		0.00
Invoice Total Due		$1,630.80
Due Date		05/23/04

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/21/2004
DATE RECEIVED: 5/21/2004
DATE REPORTED: 6/17/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70882	OBS Well #1	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

SOC REPORTS

(0.001): indicates the analyte was not detected at or above the concentration indicated.
None Detected
Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-18-04
Date

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844

Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 515_040602
Date Analyzed: 6/7/2004
Report Date: 6/9/2004
Analyst: CMH
Supervisor: JW

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	**ND**	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	**ND**	ug/L	0.08	0.08	1	
137	DALAPON	**ND**	ug/L	2	2	200	
139	DINOSEB	**ND**	ug/L	0.4	0.4	7	
140	PICLORAM	**ND**	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	**ND**	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	**ND**	ug/L	1	1.0		
136	2,4,5 T	**ND**	ug/L	0.4	0.4		
220	BENTAZON	**ND**	ug/L	0.5	0.5		
221	DICHLORPROP	**ND**	ug/L	0.5	0.5		
223	ACTIFLORFIN	**ND**	ug/L	2	2.0		
225	DACTHAL (DCPA)	**ND**	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844

Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 525_040601
Date Analyzed: 6/2/2004
Report Date: 6/7/2004
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

EDGE ANALYTICAL

Reference Number: 04-3844
Lab Number: 04607654
Report Date: 6/7/2004

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844

Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 508_040601
Date Analyzed: 6/9/2004
Report Date: 6/11/2004
Analyst: CMH
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	**ND**	ug/L	2	2	3	
173	AROCLOR 1221	**ND**	ug/L	20	20		
174	AROCLOR 1232	**ND**	ug/L	0.5	0.5		
175	AROCLOR 1242	**ND**	ug/L	0.5	0.3		
176	AROCLOR 1248	**ND**	ug/L	0.1	0.1		
177	AROCLOR 1254	**ND**	ug/L	0.1	0.1		
178	AROCLOR 1260	**ND**	ug/L	0.2	0.2		
180	AROCLOR 1016	**ND**	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Reference Number: 04-3844

Project: WWBWC/ SOC

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 531_040603
Date Analyzed: 6/3/2004
Report Date: 6/8/2004
Analyst: TW
Supervisor:

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	**ND**	ug/L	1.8	1.8	40	
148	OXYMAL	**ND**	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	**ND**	ug/L	2	2.0		
142	ALDICARB	**ND**	ug/L	1	1.0		
143	ALDICARB SULFONE	**ND**	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	**ND**	ug/L	1	1.0		
145	CARBARYL	**ND**	ug/L	2	2.0		
147	METHOMYL	**ND**	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	**ND**	ug/L	1			
327	METHIOCARB	**ND**	ug/L	4			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/21/2004
DATE RECEIVED: 5/21/2004
SEND REPORT TO:
DATE REPORTED: 6/17/2004

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

LAB NO.	CLIENT ID / PROJECT NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS BY
70882	OBS Well #1	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<(0.001) indicates the analyte was not detected at or above the concentration indicated.
ND None Detected
mg/L Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-18-04
Date

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844
Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 515_040602
Date Analyzed: 6/7/2004
Report Date: 6/9/2004
Analyst: CMH
Supervisor: JW

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC37

EDGE ANALYTICAL
11525 Knudson Rd
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844
Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 525_040601
Date Analyzed: 6/2/2004
Report Date: 6/7/2004
Analyst: CMH
Supervisor: TW

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
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J - Estimated value.

FORM: SOC07

EDGE ANALYTICAL

Reference Number: 04-3844
Lab Number: 04607654
Report Date: 6/7/2004

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
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J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 • FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844
Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 508_040601
Date Analyzed: 6/9/2004
Report Date: 6/11/2004
Analyst: CMH
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.5	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
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J - Estimated value.

FORM: SOC97

EDGE ANALYTICAL
11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-3844
Project: WWBWC/ SOC

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type: B - Before treatment
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County: Umatilla

Field ID: 70882
Lab Number: 04607654
Date Collected: 5/21/2004
Date Extracted: 531_040603
Date Analyzed: 6/3/2004
Report Date: 6/8/2004
Analyst: TW
Supervisor:

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM SOC97

Kuo Testing Labs, Inc.

337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE # 04-05-272
INVOICE DATE 05/14/04
CLIENT # WWB2170
PURCHASE ORDER#

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :
Project :

Grower :

Sampler : Bob

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70637	05/07/04	OBS Well #1,OBS Well #3	FECAL	Fecal Coliform	2	67.50	135.00

Notes: 04-05-272

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

Invoice Total		135.00
Discount	0 %	-0.00
FAX Charge		0.00
Invoice Total Due		$135.00
Due Date		06/13/04

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/7/2004
DATE RECEIVED: 5/7/2004
DATE REPORTED: 5/12/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70637	OBS Well #1	Fecal E-Coli	<2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
None Detected
: Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

05-12-04
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/7/2004
DATE RECEIVED: 5/7/2004
DATE REPORTED: 5/11/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70638	OBS Well #3	Fecal E-Coli	2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
None Detected
:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

05-11-04
Date

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY
If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH / DAY / YEAR)	TIME COLLECTED	COUNTY NAME
4 / 13 / 04	7 : 30 ☒ AM ☐ PM	Umatilla

TYPE OF SYSTEM: ☐ PUBLIC ☐ INDIVIDUAL (serves only 1 residence)
(IF PUBLIC SYSTEM, COMPLETE:) I.D. No. [ ][ ][ ][ ][ ][ ] CIRCLE GROUP A B

NAME OF SYSTEM: HBDC Recharge Project

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: Well #1

TELEPHONE NO. DAY 547-3534 EVENING 547-933-2700

SAMPLE COLLECTED BY: (Name) Brady

SYSTEM OWNER/MGR.: (Name) HBDC / UMCBLDC

SOURCE TYPE ☐ GROUND WATER UNDER SURFACE INFLUENCE
☐ SURFACE ☒ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

WASHINGTON

TYPE OF SAMPLE (check only one in this column)
☐ ROUTINE DRINKING WATER check treatment → ☐ Chlorinated (Residual: ____ Total ____ Free) ☐ Filtered ☐ Untreated or Other ____
☐ REPEAT SAMPLE Previous coliform presence Lab # ____ Date ____ / ____ / ____

☒ ~~RAW SOURCE~~ Well WATER Source # 5 [ ][ ]
☐ NEW CONSTRUCTION or REPAIRS
☐ OTHER (Specify) ____

☐ Total Coliform ☐ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☒ UNSATISFACTORY, Coliforms present
REPEAT SAMPLES REQUIRED: ☒ ~~Total~~ MS Coli present ☒ E. Coli absent ☐ Fecal present ☐ Fecal absent

☐ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ____ /100 ml E. COLI ____ /100ml
FECAL COLIFORM ____ /100 ml PLATE COUNT ____ /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
☐ Sample too old
☐ Wrong container
☐ Incomplete form
☐ ____

TEST UNSUITABLE BECAUSE:
☐ Confluent growth
☐ TNTC
☐ Turbid culture
☐ Excess debris

SEE REVERSE SIDE OF GREEN COPY FOR EXPLANATION OF RESULTS

LAB NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
109-70893	4/14/04 930	

DATE REPORTED	LABORATORY
4/16/04	

REMARKS
DOH 368-002 (REV. 4/92)

Faxed to Kevin Lindsay 2:20pm 4/16/04 Gina

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY
If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH / DAY / YEAR)	TIME COLLECTED	COUNTY NAME
4 / 13 / 4	8 : 30 ☒ AM ☐ PM	Umatilla

TYPE OF SYSTEM: ☐ PUBLIC ☐ INDIVIDUAL (serves only 1 residence)
IF PUBLIC SYSTEM, COMPLETE: I.D. No. [ ] CIRCLE GROUP A B

NAME OF SYSTEM: HSDIC Recharge #17

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: Intake
TELEPHONE NO. DAY (541) 938-2170 EVENING

SAMPLE COLLECTED BY: (Name) Intake
SYSTEM OWNER/MGR.: (Name) HSDIC

SOURCE TYPE ☐ GROUND WATER UNDER SURFACE INFLUENCE
☒ SURFACE ☐ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)
Bauer WWBWC
PO Box 68 Milton-Freewater WASHINGTON 97862

TYPE OF SAMPLE (check only one in this column)
☐ ROUTINE DRINKING WATER check treatment → ☐ Chlorinated (Residual: ___ Total ___ Free) ☐ Filtered ☐ Untreated or Other
☐ REPEAT SAMPLE Previous coliform presence Lab # Date

☐ RAW SOURCE WATER Source # 8
☐ NEW CONSTRUCTION or REPAIRS
☐ OTHER (Specify)
☐ Total Coliform ☐ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☒ UNSATISFACTORY, Coliforms present — REPEAT SAMPLES REQUIRED: ☒ E. Coli present ☐ E. Coli absent ☐ Fecal present ☐ Fecal absent
☐ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ____ /100 ml E. COLI ____ /100ml
FECAL COLIFORM ____ /100 ml PLATE COUNT ____ /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
☐ Sample too old
☐ Wrong container
☐ Incomplete form
☐ ____

TEST UNSUITABLE BECAUSE:
☐ Confluent growth
☐ TNTC
☐ Turbid culture
☐ Excess debris

SEE REVERSE SIDE OF GREEN COPY FOR EXPLANATION OF RESULTS

LAB NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
109-70989	4/14/04 800	

DATE REPORTED: 4/16/04 LABORATORY:

REMARKS
DOH 305-002 (REV. 4/93)

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY
If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH / DAY / YEAR)	TIME COLLECTED	COUNTY NAME
4 / 13 / 4	8 : 30 ☒ AM ☐ PM	Umatilla

TYPE OF SYSTEM: ☐ PUBLIC ☐ INDIVIDUAL (serves only 1 residence)
IF PUBLIC SYSTEM, COMPLETE: I.D. No. [ ]
CIRCLE GROUP: A B

NAME OF SYSTEM: HBDIC Recharge #174

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: Intake
TELEPHONE NO. DAY (541) 938-2170 EVENING

SAMPLE COLLECTED BY: (Name) Intake
SYSTEM OWNER/MGR.: (Name) HBDIC

SOURCE TYPE: ☐ GROUND WATER UNDER SURFACE INFLUENCE
☒ SURFACE ☐ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)
Bruce WWBWC
PO Box 68 Milton-Freewater, OR 97862
WASHINGTON

TYPE OF SAMPLE (check only one in this column)
☐ ROUTINE DRINKING WATER check treatment → ☐ Chlorinated (Residual: ___ Total ___ Free) ☐ Filtered ☐ Untreated or Other ___
☐ REPEAT SAMPLE Previous coliform presence Lab # ___ Date ___
☐ RAW SOURCE WATER Source # S [ ] ☐ Total Coliform ☐ Fecal Coliform
☐ NEW CONSTRUCTION or REPAIRS
☐ OTHER (Specify) ___

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☒ UNSATISFACTORY, Coliforms present — REPEAT SAMPLES REQUIRED: ☒ E. Coli present ☐ E. Coli absent ☐ Fecal present ☐ Fecal absent
☐ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ___ /100 ml E. COLI ___ /100ml
FECAL COLIFORM ___ /100 ml PLATE COUNT ___ /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
☐ Sample too old
☐ Wrong container
☐ Incomplete form
☐ ___

TEST UNSUITABLE BECAUSE:
☐ Confluent growth
☐ TNTC
☐ Turbid culture
☐ Excess debris

SEE REVERSE SIDE OF GREEN COPY FOR EXPLANATION OF RESULTS

LAB NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
109-70889	4/14/04 8:00	

DATE REPORTED: 4/16/04
LABORATORY:

REMARKS

DOH 305-002 (REV. 4/92)
DP CENTER COPY

Bob Bower

From: "Bob Bower" <bob.bower@wwbwc.org>
To: "Walla Walla River Irrigation District" <wwrid@qwest.net>; "Tony Justus" <tony.g.justus@wrd.state.or.us>; <Stephen.c.hall@usace.army.mil>; "Rick George" <rickgeorge@ctuir.com>; "Phil Richerson" <RICHERSON.Phil@deq.state.or.us>; "Mike Ladd" <michael.f.ladd@wrd.state.or.us>; "Kevin Scribner" <ktscribner@gohighspeed.com>; "Jon Brough" <jon@gohighspeed.com>; "John Zerba" <wahs@bmi.net>; "John Warinner" <warinner@bmi.net>; "John Covert" <jcov461@ecy.wa.gov>; "Jim Chambers" <Jim.R.CHAMBERS@WRD.State.or.us>; "Gary James" <garyjames@ctuir.com>; "Donn Miller" <Donn.W.MILLER@wrd.state.or.us>; "Dan Evans GTH-Law" <devans@gth-law.com>; "Chris J Hyland" <chris.j.hyland@nww01.usace.army.mil>; "Brian Wolcott" <brian.wolcott@wwbwc.org>; "Brian Mayer OWRD-Wells Inspector" <brian.m.mayer@wrd.state.or.us>; "Bill Neve" <wnev461@ecy.wa.gov>; "Tom Darnell" <Thomas.Darnell@orst.edu>
Cc: "WOLGAMOTT Mitch" <WOLGAMOTT.Mitch@deq.state.or.us>; "Stephanie Eaton" <stephanie.eaton@wwbwc.org>; "Gina Massoni" <gina.massoni@wwbwc.org>; "Eric Pfeifer" <pfeifdog@whitties.org>; "Rivera Chris" <chris.rivera@wwbwc.org>; "Brian Wolcott" <brian.wolcott@wwbwc.org>; "Bob Chicken" <bob.chicken@wwbwc.org>; "Bob Bower" <Bob.bower@wwbwc.org>
Sent: Thursday, April 22, 2004 11:34 AM
Subject: WQ update

Good morning,

Some news on the recharge site (left voice mail with Phil).

After our fecal coliform hit at the intake site (ditch water) last week, I did a battery of fecal and E. coli (CFU counts) samples on:

(1) Intake (ditch water)
(2) Well 1 (downgradient obs well, influenced by project water)
(3) Well 3 (upgradient control well).

I just received the results this am (via phone and fax):

Recharge Intake was **fecal 40 cfus, E. Coli 24.1 (cfus = colony forming units per 100 ml)**
Well # 1 **fecal 3.1 cfus, E. Coli 2.0**
Upgradient control Well # 3 **fecal 14.8, E. Coli 7.5**

In my opinion this is what I believe is going on (knowing that this a very small sample size).

We know that the ditch by itself brought up the aquifer ~20 feet **before** we turned on the recharge project. I would guess that the ditch is the main vector for movement of the bacteria based on reported concentrations and the aquifer static being dramatically influenced by the ditch without the project being on. I would say that the problem may be background all along the ditch back to where ever the source is. I have 12 more fecal/e. coli concentration (cfus) tests ordered (here Monday) that I was going to use to move back up gradient of the site and test both ditch and wells along the way. I would also take three samples from Well #1 (recharge influenced) throughout a 24 hour period, to see if this is an episodic plume type event.

As I told Phil on the phone, hind site is 20-20. We have WQ samples for the conditions before the ditch was on, and after the ditch AND the recharge project were running. What we missed was a WQ sample with JUST the ditch on, which would provide us with a better background condition for the recharge operation. We can capture that when we turned off the project and sample before the ditch goes off. One thing we can definitely refine for next year's recharge season.

In my thesis work in the Tillamook watershed, we saw that septic related feces in river/streams appeared to trend with time of day. Early morning and evenings when people are home, using their toilets, showers, etc. Certainly

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/21/2004
DATE RECEIVED: 5/21/2004
DATE REPORTED: 6/7/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70878	OBS Well #1	Fecal Coliform	<2	2	MPN/100mL	Cascade Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-07-02
Date

Kuo Testing Labs, Inc.

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/21/2004
DATE RECEIVED: 5/21/2004
DATE REPORTED: 6/7/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70879	OBS Well #3	Fecal Coliform	<2	2	MPN/100mL	Cascade Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
: Indicates milligrams per litre
=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
Method Detection Limit
e check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-07-02
Date

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Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/21/2004
DATE RECEIVED: 5/21/2004
DATE REPORTED: 6/7/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70880	Intake	Fecal Coliform	130	2	MPN/100mL	Cascade Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
:Indicates milligrams per litre
=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
Method Detection Limit
check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-07-02
Date

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DATE COLLECTED: 5/7/2004
DATE RECEIVED: 5/7/2004
DATE REPORTED: 5/12/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70637	OBS Well #1	Fecal E-Coli	<2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

05-12-04
Date

Kuo Testing Labs, Inc.

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(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/7/2004
DATE RECEIVED: 5/7/2004
DATE REPORTED: 5/11/2004

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
70638	OBS Well #3	Fecal E-Coli	2	2	CFU/100ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

05-11-04
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue Othello, WA 99344
(509)488-0112 (800)328-0112 Fax (509)488-0118 Web Site http://www.kuotesting.com

INORGANIC CHEMICALS (IOCS) REPORT FOR NITRATES

Type of System: **Individual**

Water System/Customer Name: **W.W.B.W.C.** **PWS ID No.:41**

System Address **PO Box 68**

CITY **Milton Freewater** County **Umatilla** ZIP **97862**

Sample Location: **Well #2-Recharge Project** (should be Well #1)

Date Collected: **3/10/2004** *Date Received:* **3/11/2004** *Date Analyzed:* **3/15/2004**

Laboratory No.:WA060-69716 *Date Reported:* **3/15/2004**

Party To Pay for Testing: **W.W.B.W.C** Send Results To: **Bob Bower**

PO Box 68 **PO Box 68**

Milton Freewater OR 97862 **Milton Freewater OR 97862**

Contaminant - Method	Code	MCL mg/L	Analyst	Analysis mg/L
Nitrate (NO3- N)SM4500-NO3-D	1040	10.	Qian	1.64
Nitrite (NO2-N)SM4500-NO2-B	1041	1.0		
Nitrite + Nitrate	1038	10.		

NOTES:

MCL (Maximum Contaminant Level): if the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA (Not Analyzed): in the results column indicates this compound was not included in the current analysis.

ND (Not Detected): in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the value shown.

mg/L: indicates milligrams per liter or parts per million.

<0.100: indicates the compound was detected but at a value below the concentration indicated.

Comments: See our new Web Site at **http://www.kuotesting.com**

Dr. Eugene Kuo, Quality Assurance Coordinator

03-15-04
Date

pd $41.00 - #1548 4/1/04

Enter Public Water System ID # in boxes below:

4	1					

Name of Water System: W.W.B.W.C.

Phone 541-938-2170 County Umatilla

Collection date and time: 3 / 10 / 04 (Month / Day / Year) 3 : 15 (Hour : Min) a.m. p.m.

Type of sample: ❑ Routine ❑ *Repeat ❑ Special

*If repeat, date of initial positive _____

If repeat, location: ❑ Upstream ❑ Same ❑ Downstream ❑ Other

Collected by: Bob Bauer

Sample point: well #2

Chlorinated? ❑ Yes ❑ No Free chlorine mg/l _____

Return address for report:

Name Bob Bauer

Address P.O. Box 68

City, state, zip Milton-Freewater, OR 97862

Send results to: **DHS-Drinking Water Program: P.O. Box 14350, Portland OR 97293-0350 Phone (503) 731-4381**

DHS oregon department of human services

MICROBIOLOGICAL ANALYSIS

PUBLIC WATER SUPPLIES
DRINKING WATER PROGRAM

LABORATORY RESULTS

Total coliforms: ❑ Present* ❑ Absent

Fecal coliforms/*E.coli:* ❑ Present* ❑ Absent

*see back of pink copy for interpretation

Test Methods:

Total coliforms: ❑ MTF ❑ MF ❑ P-A ❑ CF

Fecal coliforms: ❑ EC

E. coli: ❑ CF ❑ EC+MUG ❑ Nutrient Agar + MUG
❑ cytochrome oxidase/Beta-galactosidase

*If repeat, sample ID of initial positive: _____

❑ Sample invalid: resample immediately

Copy Distribution:
White: Lab
Yellow: Dept. of Human Services
Pink: Water System

Form # 50-90 (Rev. 1/02)

Laboratory Name

Lab ID # W1004

Sample # 69715

Date & time received: 3/11/04 1215

Received by: RJ

Date & time analysis begun: 3/11/04 14:30

Comments:

Invalidation reason:
❑ Leaked ❑ Over 30 hrs. old
❑ Heavy non-coliform growth (as defined by method)
❑ Other _____

Analyst: _____ Date: 3/11/04

Review by: _____ Date: 3/12/04

Kuo Testing Labs, Inc.

337 South 1st Avenue Othello, WA 99344
(509)488-0112 (800)328-0112 Fax (509)488-0118 Web Site http://www.kuotesting.com

INORGANIC CHEMICALS (IOCS) REPORT FOR NITRATES

Type of System: **Individual**

Water System/Customer Name: **W.W.B.W.C.** PWS ID No.:**41**

System Address **PO Box 68**

CITY **Milton Freewater** County **Umatilla** ZIP **97862**

Sample Location: **Well #1**

Date Collected: **4/13/2004** *Date Received:* **4/14/2004** *Date Analyzed:* **4/15/2004**

Laboratory No.:WA060-70294 *Date Reported:* **4/15/2004**

Party To Pay for Testing: **W.W.B.W.C.** Send Results To: **Bob Bowel**

PO Box 68 **PO Box 68**

Milton Freewater OR 97862 **Milton Freewater OR 97862**

Contaminant - Method	Code	MCL mg/L	Analyst	Analysis mg/L
Nitrate (NO3- N)SM4500-NO3-D	1040	10.	Qian	ND
Nitrite (NO2-N)SM4500-NO2-B	1041	1.0		
Nitrite + Nitrate	1038	10.		

NOTES:

MCL (Maximum Contaminant Level): if the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA (Not Analyzed): in the results column indicates this compound was not included in the current analysis.

ND (Not Detected): In the results column indicates this compound was analyzed and not detected at a level greater than or equal to the value shown.

mg/L: indicates milligrams per liter or parts per million.

<0.100: indicates the compound was detected but at a value below the concentration indicated.

Comments: See our new Web Site at http://www.kuotesting.com

Mollyann for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 15, 2004
Date

IOCS NITRATES

orig. bill to Gina to pay

Kuo Testing Labs, Inc.

337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE #	04-04-258
INVOICE DATE	04/16/04
CLIENT #	WWB2170
PURCHASE ORDER#	

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E70289	04/14/04	Intake,Well #1	A1-1	Total Coliform and E. Coli	2	17.00	34.00
E70289	04/14/04	Intake,Well #1	A2-1	NO3-N	2	24.00	48.00

Notes: 04-04-258

Invoice Total	82.00
Discount 0 %	-0.00
FAX Charge	0.00
Invoice Total Due	$82.00
Due Date	05/16/04

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY

If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH / DAY / YEAR)	TIME COLLECTED	COUNTY NAME
4 / 13 / 04	7 : 30 ☒ AM ☐ PM	Umatilla

TYPE OF SYSTEM: ☐ PUBLIC ☐ INDIVIDUAL (serves only 1 residence)

IF PUBLIC SYSTEM, COMPLETE: I.D. No. [ ][ ][ ][ ][ ][ ]

CIRCLE GROUP: A B

NAME OF SYSTEM: HBDIC Recharge Project

SPECIFIC LOCATION WHERE SAMPLE COLLECTED	TELEPHONE NO.
Well #1	DAY (509) 520-3534
	EVENING (541) 938-2170
SAMPLE COLLECTED BY: (Name) Bowker	SYSTEM OWNER/MGR.: (Name) HBDIC / Lowe Rec

SOURCE TYPE: ☐ GROUND WATER UNDER SURFACE INFLUENCE

☐ SURFACE ☒ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

WASHINGTON

TYPE OF SAMPLE (check only one in this column)

☐ ROUTINE DRINKING WATER check treatment →
- ☐ Chlorinated (Residual: ____ Total ____ Free)
- ☐ Filtered
- ☐ Untreated or Other ____

☐ REPEAT SAMPLE Previous coliform presence Lab # ____ Date ____/____/____

☒ RAW SOURCE WATER (WELL) Source # S [ ][ ]
☐ NEW CONSTRUCTION or REPAIRS
☐ OTHER (Specify) ____

☐ Total Coliform
☐ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☒ UNSATISFACTORY, Coliforms present

REPEAT SAMPLES REQUIRED: ☒ E. Coli present (MG) ☒ E. Coli absent ☐ Fecal present ☐ Fecal absent

☐ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ____ /100 ml E. COLI ____ /100ml
FECAL COLIFORM ____ /100 ml PLATE COUNT ____ /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
- ☐ Sample too old
- ☐ Wrong container
- ☐ Incomplete form
- ☐ ____

TEST UNSUITABLE BECAUSE:
- ☐ Confluent growth
- ☐ TNTC
- ☐ Turbid culture
- ☐ Excess debris

SEE REVERSE SIDE OF GREEN COPY FOR EXPLANATION OF RESULTS

NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
109-70393	4/14/04 800	

DATE REPORTED: 4/16/04 LABORATORY:

REMARKS

DOH 305-002 (REV. 4/92)

WATER SUPPLIER COPY

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY

If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH / DAY / YEAR)	TIME COLLECTED	COUNTY NAME
4 / 13 / 4	: ☐ AM ☐ PM	

TYPE OF SYSTEM
☐ PUBLIC
☐ INDIVIDUAL (serves only 1 residence)

IF PUBLIC SYSTEM, COMPLETE:
I.D. No. [| | | | | |]
CIRCLE GROUP A B

NAME OF SYSTEM

SPECIFIC LOCATION WHERE SAMPLE COLLECTED	TELEPHONE NO.
	DAY ( )
	EVENING ( )
SAMPLE COLLECTED BY: (Name)	SYSTEM OWNER/MGR.: (Name)

SOURCE TYPE ☐ GROUND WATER UNDER SURFACE INFLUENCE
☐ SURFACE ☐ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

WASHINGTON

TYPE OF SAMPLE (check only one in this column)

☐ ROUTINE DRINKING WATER check treatment →
- ☐ Chlorinated (Residual: ____ Total ____ Free)
- ☐ Filtered
- ☐ Untreated or Other ____

☐ REPEAT SAMPLE Previous coliform presence Lab # ____
Date ____ / ____ / ____

☐ RAW SOURCE WATER Source # S [ ]
☐ NEW CONSTRUCTION or REPAIRS
☐ OTHER (Specify) ____

☐ Total Coliform
☐ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☒ UNSATISFACTORY, Coliforms present

REPEAT SAMPLES REQUIRED
- ☒ E. Coli present
- ☐ E. Coli absent
- ☐ Fecal present
- ☐ Fecal absent

☐ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ____ /100 ml
FECAL COLIFORM ____ /100 ml
E. COLI ____ /100ml
PLATE COUNT ____ /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
- ☐ Sample too old
- ☐ Wrong container
- ☐ Incomplete form
- ☐ ____

TEST UNSUITABLE BECAUSE:
- ☐ Confluent growth
- ☐ TNTC
- ☐ Turbid culture
- ☐ Excess debris

SEE REVERSE SIDE OF GREEN COPY FOR EXPLANATION OF RESULTS

NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
104-70589	4/14/04 [illegible]	[illegible]

DATE REPORTED 4/16/04
LABORATORY:

REMARKS

DOH 305-002 (REV. 4/92)
WATER SUPPLIER COPY

Kuo Testing Labs, Inc.

337 South 1st Avenue Othello, WA 99344
(509)488-0112 (800)328-0112 Fax (509)488-0118 Web Site http://www.kuotesting.com

INORGANIC CHEMICALS (IOCS) REPORT FOR NITRATES

Type of System: **Individual**

Water System/Customer Name: **W.W.B.W.C.**

PWS ID No.:41

System Address **PO Box 68**

CITY **Milton Freewater** County **Umatilla** ZIP **97862**

Sample Location: **Intake**

Date Collected: **4/13/2004** *Date Received:* **4/14/2004** *Date Analyzed:* **4/15/2004**

Laboratory No.:WA060-70290 *Date Reported:* **4/15/2004**

Party To Pay for Testing: **W.W.B.W.C**
PO Box 68
Milton Freewater OR 97862

Send Results To: **Bob Bower**
PO Box 68
Milton Freewater OR 97862

Contaminant - Method	Code	MCL mg/L	Analyst	Analysis mg/L
Nitrate (NO3- N)SM4500-NO3-D	1040	10.	Qian	ND
Nitrite (NO2-N)SM4500-NO2-B	1041	1.0		
Nitrite + Nitrate	1038	10.		

NOTES:

MCL (Maximum Contaminant Level): if the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA (Not Analyzed): in the results column indicates this compound was not included in the current analysis.

ND (Not Detected): in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the value shown.

mg/L: indicates milligrams per liter or parts per million.

<0.100: indicates the compound was detected but at a value below the concentration indicated.

Comments: See our new Web Site at **http://www.kuotesting.com**

Mollyein for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 15, 2004
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue Othello, WA 99344
(509)488-0112 (800)328-0112 Fax (509)488-0118 Web Site http://www.kuotesting.com

INORGANIC CHEMICALS (IOCS) REPORT FOR NITRATES

Type of System: **Individual**

Water System/Customer Name: **W.W.B.W.C.** **PWS ID No.:41**

System Address **PO Box 68**

CITY **Milton Freewater** County **Umatilla** ZIP **97862**

Sample Location: **Well #1**

Date Collected: **4/13/2004** *Date Received:* **4/14/2004** *Date Analyzed:* **4/15/2004**

Laboratory No.:WA060-70294 *Date Reported:* **4/15/2004**

Party To Pay for Testing: **W.W.B.W.C** Send Results To: **Bob Bower**

PO Box 68 **PO Box 68**

Milton Freewater OR 97862 **Milton Freewater OR 97862**

Contaminant - Method	Code	MCL mg/L	Analyst	Analysis mg/L
Nitrate (NO3- N)SM4500-NO3-D	1040	10.	Qian	ND
Nitrite (NO2-N)SM4500-NO2-B	1041	1.0		
Nitrite + Nitrate	1038	10.		

NOTES:

MCL (Maximum Contaminant Level): if the contaminant amount exceeds the MCL, immediately contact your regional DOH office.

NA (Not Analyzed): in the results column indicates this compound was not included in the current analysis.

ND (Not Detected): in the results column indicates this compound was analyzed and not detected at a level greater than or equal to the value shown.

mg/L: indicates milligrams per liter or parts per million.

<0.100: indicates the compound was detected but at a value below the concentration indicated.

Comments: See our new Web Site at **http://www.kuotesting.com**

Mollyann for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 15, 2004
Date

STATE OF WASHINGTON
DEPARTMENT OF HEALTH

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY
If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH / DAY / YEAR)	TIME COLLECTED	COUNTY NAME
4 / 13 / 04	7 : 30 ☒ AM ☐ PM	Umatilla

TYPE OF SYSTEM: ☐ PUBLIC ☐ INDIVIDUAL (serves only 1 residence)
IF PUBLIC SYSTEM, COMPLETE: I.D. No.
CIRCLE GROUP: A B

NAME OF SYSTEM: HPSDC Recharge Project

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: Well #1

TELEPHONE NO. DAY 541 564-3534 EVENING 541 938-2110

SAMPLE COLLECTED BY: (Name) Barry

SYSTEM OWNER/MGR.: (Name) HPSDC / Lowell DC

SOURCE TYPE: ☐ GROUND WATER UNDER SURFACE INFLUENCE
☐ SURFACE ☒ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

WASHINGTON

TYPE OF SAMPLE (check only one in this column)

☐ ROUTINE DRINKING WATER check treatment → ☐ Chlorinated (Residual: ___ Total ___ Free) ☐ Filtered ☐ Untreated or Other

☐ REPEAT SAMPLE Previous coliform presence Lab # ___ Date ___

☒ RAW ~~SOURCE~~ WELL WATER Source # S
☐ NEW CONSTRUCTION or REPAIRS
☐ OTHER (Specify)

☐ Total Coliform ☐ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☒ UNSATISFACTORY, Coliforms present — REPEAT SAMPLES REQUIRED
☒ ~~E. Coli~~ MO present ☐ Fecal present
☒ E. Coli absent ☐ Fecal absent

☐ SATISFACTORY, Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ___ /100 ml E. COLI ___ /100ml
FECAL COLIFORM ___ /100 ml PLATE COUNT ___ /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
☐ Sample too old
☐ Wrong container
☐ Incomplete form
☐ ___

TEST UNSUITABLE BECAUSE:
☐ Confluent growth
☐ TNTC
☐ Turbid culture
☐ Excess debris

SEE REVERSE SIDE OF GREEN COPY FOR EXPLANATION OF RESULTS

LAB NO. (7 DIGITS)	DATE TIME RECEIVED	RECEIVED BY
109-70893	4/14/04 800	

DATE REPORTED 4/16/04 LABORATORY:

REMARKS
DOH 306-002 (REV. 4/92)
DO CENTER COPY

Appendices I-B

HBDIC Recharge Water Quality Testing:

Lab Results, Notes and Records

2004-2005 Recharge Season

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/19/2005
DATE RECEIVED: 5/20/2005
DATE REPORTED: 6/24/2005

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
76494	OBS-#1	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

01): indicates the analyte was not detected at or above the concentration indicated.
None Detected
/L:Indicates milligrams per litre
QL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-24-05
Date

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HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 05-05830

Project: 76494

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS #1
County:

Field ID: W W B W C
Lab Number: 04613162
Date Collected: 5/19/2005
Date Extracted: 515_050601
Date Analyzed: 6/3/2005
Report Date: 6/6/2005
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	**ND**	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	**ND**	ug/L	0.08	0.08	1	
137	DALAPON	**ND**	ug/L	2	2	200	
139	DINOSEB	**ND**	ug/L	0.4	0.4	7	
140	PICLORAM	**ND**	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	**ND**	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	**ND**	ug/L	1.0	1.0		
136	2,4,5 T	**ND**	ug/L	0.4	0.4		
220	BENTAZON	**ND**	ug/L	0.5	0.5		
221	DICHLORPROP	**ND**	ug/L	0.5	0.5		
223	ACTIFLORFIN	**ND**	ug/L	2.0	2.0		
225	DACTHAL (DCPA)	**ND**	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 05-05830

Project: 76494

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS #1
County:
Sampled By:
Sampler Phone:

Field ID: W W B W C
Lab Number: 04613162
Date Collected: 5/19/2005
Date Extracted: 525_050601
Date Analyzed: 6/7/2005
Report Date: 6/17/2005
Analyst: MW
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1.0	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		Qualitative Analysis Only
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		Unstable in Acidified Sample Matrix
208	EPTC	ND	ug/L	0.3	0.3		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
232	4,4-DDD	ND	ug/L	0.2	0.2		
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		Qualitative Analysis Only
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	!NDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 05-05830

Project: 76494

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS #1
County:

Field ID: W W B W C
Lab Number: 04613162
Date Collected: 5/19/2005
Date Extracted: 508_050601
Date Analyzed: 6/2/2005
Report Date: 6/3/2005
Analyst: MW
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	**ND**	ug/L	2	2	3	
173	AROCLOR 1221	**ND**	ug/L	20	20		
174	AROCLOR 1232	**ND**	ug/L	0.5	0.5		
175	AROCLOR 1242	**ND**	ug/L	0.5	0.3		
176	AROCLOR 1248	**ND**	ug/L	0.1	0.1		
177	AROCLOR 1254	**ND**	ug/L	0.1	0.1		
178	AROCLOR 1260	**ND**	ug/L	0.2	0.2		
180	AROCLOR 1016	**ND**	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS #1
County:
Sampled By:
Sampler Phone:

Reference Number: 05-05830

Project: 76494

Field ID: W W B W C
Lab Number: 04613162
Date Collected: 5/19/2005
Date Extracted: 531_050609
Date Analyzed: 6/9/2005
Report Date: 6/13/2005
Analyst: TW
Supervisor:

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4.0	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2.0	2.0		
142	ALDICARB	ND	ug/L	1.0	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1.0	1.0		
145	CARBARYL	ND	ug/L	2.0	2.0		
147	METHOMYL	ND	ug/L	1.0	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1.0			
327	METHIOCARB	ND	ug/L	4			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE RECEIVED	DATE REPORTED	DATE RESULTED
12/8/2004	12/9/2004	1/24/2005

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

LAB NO.	SAMPLE ID	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS BY
74116	OBS Well #1	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<0.(001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

01-24-05
Date

EDGE ANALYTICAL
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Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075
Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County:

Field ID: 74116
Lab Number: 04624846
Date Collected: 12/8/2004
Date Extracted: 515_041217
Date Analyzed: 1/5/2005
Report Date: 1/7/2005
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected = or > to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value

FORM 60C97

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075
Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County:

Field ID: 74116
Lab Number: 04624846
Date Collected: 12/8/2004
Date Extracted: 525_041220
Date Analyzed: 12/22/2004
Report Date: 1/6/2005
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (B HC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		
233	4,4-DDE	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH
**** Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 95% confidence that the compound concentration is greater than zero
J - Estimated value

EDGE ANALYTICAL

Reference Number: 04-12075
Lab Number: 04624845
Report Date: 1/5/2005

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

* An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: BOC9/

FAX NO. 5094886865 KUO TESTINGLABSINC OCT-26-05 WED 9:42 AM

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(360) 757-1400 - FAX (360) 757-1402

CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075

Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County:

Field ID: 74116
Lab Number: 04624846
Date Collected: 12/8/2004
Date Extracted: 531_041215
Date Analyzed: 12/15/2004
Report Date: 12/20/2004
Analyst: TW
Supervisor:

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

* An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA. NPDWR. State Advisory Level (SAL) for Unregulated compounds
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero
J - Estimated value.

FORM: SOC67

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075

Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: OBS Well #1
County:

Field ID: 74116
Lab Number: 04624846
Date Collected: 12/8/2004
Date Extracted: 508_041220
Date Analyzed: 1/17/2005
Report Date: 1/7/2005
Analyst: CMH
Supervisor: [signature]

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.5	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

* An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected + or - to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero
J - Estimated value.

FORM: SOC97

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED 12/8/2004 DATE RECEIVED SEND REPORT TO 12/9/2004 1/24/2005

SYSTEM/SOURCE/ID

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MCL	UNIT	ANALYST
74115	Intake	SOC/Synthetic Organic Co	Report		mg/L	Edge Analytical

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

01-24-05
Date

OCT-26-05 WED 9:40 AM KUO TESTINGLABSINC FAX NO. 5094886865 P. 3

EDGE ANALYTICAL
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CARBAMATES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075

Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: Intake
County:

Field ID: 74115
Lab Number: 04624845
Date Collected: 12/8/2004
Date Extracted: 531_041215
Date Analyzed: 12/15/2004
Report Date: 12/20/2004
Analyst: TW
Supervisor: PM

EPA Method 531.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	ND	ug/L	1.8	1.8	40	
148	OXYMAL	ND	ug/L	4	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	ND	ug/L	2	2.0		
142	ALDICARB	ND	ug/L	1	1.0		
143	ALDICARB SULFONE	ND	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	ND	ug/L	1	1.0		
145	CARBARYL	ND	ug/L	2	2.0		
147	METHOMYL	ND	ug/L	1	4.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	ND	ug/L	1			
327	METHIOCARB	ND	ug/L	4			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds
A blank MCL or SAL value indicates a level is not currently established
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero
J - Estimated value.

FORM: SOCS7

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075

Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: Intake
County:

Field ID: 74115
Lab Number: 04624845
Date Collected: 12/8/2004
Date Extracted: 525_041220
Date Analyzed: 12/21/2004
Report Date: 1/5/2005
Analyst: CMH
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
127	HEPTACHLOR EPOXIDE (A&B)	ND	ug/L	0.04	0.04	0.2	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		
208	EPTC	ND	ug/L	0.3	0.3		
232	4,4-DDD	ND	ug/L	0.2	0.2		
233	4,4-DDE	ND	ug/L	0.2	0.2		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA; NPDWR State Advisory Level (SAL) for Unregulated compounds
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

OCT-26-05 WED 9:41 AM KUO TESTINGLABSINC FAX NO. 5094888865 P. 5

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HERBICIDES IN DRINKING WATER

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Reference Number: 04-12075

Project: 74115/74116

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: Intake
County:

Field ID: 74115
Lab Number: 04624845
Date Collected: 12/8/2004
Date Extracted: 515_041217
Date Analyzed: 1/5/2005
Report Date: 1/7/2005
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	ND	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	ND	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	ND	ug/L	0.08	0.08	1	
137	DALAPON	ND	ug/L	2	2	200	
139	DINOSEB	ND	ug/L	0.4	0.4	7	
140	PICLORAM	ND	ug/L	0.2	0.2	500	SEE COVER NOTE
	EPA Unregulated						
138	DICAMBA	ND	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	ND	ug/L	1	1.0		
136	2,4,5 T	ND	ug/L	0.4	0.4		
220	BENTAZON	ND	ug/L	0.5	0.5		
221	DICHLORPROP	ND	ug/L	0.5	0.5		
223	ACTIFLORFIN	ND	ug/L	2	2.0		
225	DACTHAL (DCPA)	ND	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value

FORM: SOC97

FAX NO. 5094888865 KUO TESTINGLABSINC OCT-26-05 WED 9:41 AM

Allen French

Allen F@EdgeAnalytical.com

EDGE ANALYTICAL
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Burlington, WA 98233
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(360) 757-1400 - FAX (360) 757-1402

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: Intake
County:

Reference Number: 04-12075

Project: 74115/74116
Field ID: 74115
Lab Number: 04624845
Date Collected: 12/8/2004
Date Extracted: 508_041220
Date Analyzed: 12/22/2004
Report Date: 1/5/2005
Analyst: CMH
Supervisor: [signature]

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	ND	ug/L	2	2	3	
173	AROCLOR 1221	ND	ug/L	20	20		
174	AROCLOR 1232	ND	ug/L	0.5	0.5		
175	AROCLOR 1242	ND	ug/L	0.6	0.3		
176	AROCLOR 1248	ND	ug/L	0.1	0.1		
177	AROCLOR 1254	ND	ug/L	0.1	0.1		
178	AROCLOR 1260	ND	ug/L	0.2	0.2		
180	AROCLOR 1016	ND	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero
J - Estimated value

FORM: SOC97

OCT-26-05 WED 9:43 AM KUO TESTINGLABSINC FAX NO. 5094886865 P. 7

EDGE ANALYTICAL

Reference Number: 04-12075
Lab Number: 04624846
Report Date: 1/6/2005

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.

**- Maximum Contaminant Level, maximum permissable level of a contaminant in water established by EPA, NPDWR State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.

***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.

****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J Estimated value

FORM SOC97

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 12/1/2004
DATE RECEIVED: 12/6/2004
SEND REPORT TO:
DATE REPORTED: 12/6/2004

SUBMITTED BY:
W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE No.	CUSTOMER SAMPLE ID	ANALYSIS	RESULTS	MCL	UNITS	ANALYSTS
74008	Reesa Well	Fecal E-Coli	3	1	MPN/100mL	Valley Enviornmenal

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND None Detected
mg/L Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL Method Detection Limit
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Dr. Eugene Kuo, Quality Assurance Coordinator

12-07-04
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74008	Reesa Well	Fecal E-Coli	3	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74025	McKnight	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
L: Method Detection Limit
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74009	Brown	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
QL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74010	Winesap	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74011	Frog	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74012	Vern's Well	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74013	LeFore	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74014	John P.	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74015	Wondra Well	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74016	OBS Well 3B	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74017	OBS Well #2	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74018	OBS Well 1A	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74019	OBS Well 1B	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74020	Intake B	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74021	Intake A	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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Project Name:

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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74022	OBS Well 4	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74023	GW-39	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74024	Prunedale	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
DL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

12-07-04
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED 12/1/2004

DATE RECEIVED

DATE REPORTED 11/28/2005

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO: 12/20/200

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74313	OBS Well 3A	Fecal E-Coli	<1	1	MPN/100ml	Cascade Analytical

*(U.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L Indicates milligrams per litre
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DATE COLLECTED 1/5/2005

DATE RECEIVED 1/6/2005

DATE REPORTED 11/28/2005

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO

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PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74644	GW 62	Fecal E-Coli	11	1	MPN/100ml	Cascade Analytical

<(U.001): indicates the analyte was not detected at or above the concentration indicated
ND: None Detected
mg/L: Indicates milligrams per litre
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DATE COLLECTED 1/5/2005 DATE RECEIVED 1/6/2005 DATE REPORTED 11/28/2005

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

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Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74643	OBS Well 1	Fecal E-Coli	2	1	MPN/100ml	Cascade Analytical

<(0.00) indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L Indicates milligrams per litre .
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DATE COLLECTED: 5/19/2005
DATE RECEIVED: 5/25/2005
DATE REPORTED: 5/25/2005

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
76546	OBS #1	Fecal E-Coli	5	1	MPN/100 ml	Valley Enviornental

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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Dr. Eugene Kuo, Quality Assurance Coordinator

05-25-05
Date

Kuo Testing Labs, Inc.
337 South 1st
Othello, Washington 99344
(509) 488-0112; Fax (509) 488-0118

Agricultural - Industrial - Environmental

INVOICE #	04-12-091
INVOICE DATE	12/10/04
CLIENT #	WWB2170
PURCHASE ORDER#	

Client: W.W.B.W.C.
Address: PO Box 68
MiltonFreewater, OR 97862

PN :

Project :

Grower :

Sampler : Bob Bower

RptNo	RptDate	Field Identifier	Test	Description	Qty	Price	Extension
E74008	12/06/04	Brown,Frog,GW-39,Intake A,Intake B,John P.,LeFore, McKnight,OBS Well #2,OBS Well 1A,OBS Well 1B,OBS Well 3B, OBS Well 4,Prunedale,Reesa Well,Vern's Well,Winesap, Wondra Well	FECAL	Fecal Coliform	18	67.50	1,215.00

Notes: 04-12-091

Invoice Total		1215.00
Discount	0 %	-0.00
FAX Charge		0.00
Invoice Total Due		$1,215.00
Due Date		01/09/05

Terms: Net 30 days following date of invoice. Invoices not paid in 30 days will be subject to interest charged at 1.5% per month (18% per year) with a minimum charge of 50 cents.

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DATE COLLECTED: 12/1/04
DATE RECEIVED: 12/20/04
DATE REPORTED: 12/20/04

SYSTEM / CUSTOMER

W.W.B.W.C.
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Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74313	OBS Well 3A	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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DATE COLLECTED: 12/1/2004
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SUBMITTED BY:
W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	SAMPLE ID	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS BY
74012	Vern's Well	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated
ND: None Detected
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SYSTEM CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
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Attn:

SAMPLE NO	SYSTEM/SITE SAMPLED	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74011	Frog	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SYSTEM/CUSTOMER:
W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
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Bob Bower
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Attn:

SAMPLE NO	SAMPLE DESCRIPTION	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS BY
74010	Winesap	Fecal E-Coli	<1	1	MPN/100ml	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SUBMITTED BY:
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LAB NO.	SAMPLE ID / SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74009	Brown	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS BY
74025	McKnight	Fecal E-Coli	<1	1	MPN/100ml.	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:indicates milligrams per litre
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Project Name:

Bob Bower
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Attn:

SAMPLE NO	LOCATION ID / SAMPLE ID	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74013	LeFore	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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DATE COLLECTED 12/1/2004 | DATE RECEIVED 12/6/2004 | SEND REPORT TO | DATE REPORTED 12/6/2004

SUBMITTED BY:

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862

Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	SAMPLE ID / SOURCE / DESC.	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74014	John P.	Fecal E-Coli	<1	1	MPN/100ml	Valley Enviornment

<0.001): indicates the analyte was not detected at or above the concentration indicated.
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W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

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Attn:

SAMPLE NO.	SAMPLE DESCRIPTION	ANALYSIS	RESULTS	PQL	UNITS	ANALYST
74015	Wondra Well	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
74016	OBS Well 3B	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001) indicates the analyte was not detected at or above the concentration indicated.
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DATE RECEIVED
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Project Name:

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Attn:

SAMPLE NO	CLIENT SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74017	OBS Well #2	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
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Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS
74018	OBS Well 1A	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
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W.W.B.W.C.
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Attn:

LAB #	SAMPLE ID	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74019	OBS Well 1B	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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SAMPLE NO.	SAMPLE ID	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS BY
74020	Intake B	Fecal E-Coli	<1	1	MPN/100ml.	Valley Enviornment

<0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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DATE COLLECTED	DATE RECEIVED	DATE REPORTED
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SAMPLE SUBMITTED BY:

W.W.B.W.C.
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Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74021	Intake A	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND None Detected
mg/L: Indicates milligrams per litre
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SAMPLE ID NUMBER

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Attn:

LAB #	SAMPLE ID NUMBER	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74022	OBS Well 4	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

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PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
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Attn:

SAMPLE NO.	SAMPLE ID / PROJECT NO.	ANALYSIS	RESULTS	MCL	UNITS	ANALYSIS BY
74023	GW-39	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
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Date

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 12/1/2004
DATE RECEIVED: 12/6/2004
SEND REPORT TO:
DATE REPORTED: 12/6/2004

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	LOCATION & SAMPLE NO.	ANALYSIS	RESULTS	MCL	UNITS	ANALYSIS
74024	Prunedale	Fecal E-Coli	<1	1	MPN/100mL	Valley Enviornment

<(0.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL: Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

12-07-04
Date

Kuo Testing Labs, Inc.

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DATE COLLECTED: 4/6/2005
DATE RECEIVED: 4/14/2005
DATE REPORTED: 4/14/2005

SUBMITTED BY:

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS
75928	Intake	Fecal E-Coli	4	1	MPN/100 ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
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Dr. Eugene Kuo, Quality Assurance Coordinator

April 14, 2005
Date

Kuo Testing Labs, Inc.

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DATE COLLECTED: 4/6/2005
DATE RECEIVED: 4/14/2005
SEND REPORT TO: DATE REPORTED: 4/14/2005

SUBMITTED BY:
W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
75932	GW-62 9	Fecal E-Coli	<1	1	MPN/100 ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL–Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Madhuri Sud for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

Apr. 14, 2005
Date

Kuo Testing Labs, Inc.

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DATE COLLECTED: 4/6/2005
DATE RECEIVED: 4/14/2005
DATE REPORTED: 4/14/2005
SEND REPORT TO:
SYSTEM CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER'S SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
75929	OBS-1	Fecal E-Coli	1	1	MPN/100 ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Molly Lee for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 14, 2005
Date

Kuo Testing Labs, Inc.

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DATE COLLECTED: 4/6/2005
DATE RECEIVED: SEND REPORT TO 4/14/2005
DATE REPORTED: 4/14/2005

CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
75930	GW-40	Fecal E-Coli	<1	1	MPN/100 ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Molly Sinclair for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

April 14, 2005
Date

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DATE COLLECTED 4/6/2005 DATE RECEIVED 4/14/2005 SEND REPORT TO DATE REPORTED 4/14/2005

SAMPLED BY (NAME)

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS
75931	GW-62	Fecal E-Coli	2	1	MPN/100 ml	Valley Labs

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

April 14, 2005
Date

Di(2-ethylhexyl) Phthalate Chemical Backgrounder

Only Analyte Hit in 2354

Description:

Di(2-ethylhexyl) phthalate, (C.A.S. 117-81-7) also commonly called bis(2-ethylhexyl) phthalate, is a colorless, oily liquid with a slight odor. Patented in 1933, it is primarily used as one of several plasticizers in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products. These PVC resins have been used to manufacture teething rings, pacifiers, soft squeeze toys, balls, shower curtains, raincoats, adhesives, polymeric coatings, components of paper and paperboard, defoaming agents, enclosures for food containers, animal glue, surface lubricants, flexible devices for administering parenteral solutions, and other products that must stay flexible and uninjurious for their lifetime. It is also used to manufacture vinyl gloves used for medical examinations and surgery.

As a non-plasticizer, di(2-ethylhexyl) phthalate is used as a replacement for polychlorinated biphenyls (PCBs) in dielectric fluids for electric capacitors. It is also used as a solvent in erasable ink, an acaricide for use in orchards, an inert ingredient in pesticides, a component of cosmetic products, and a vacuum pump oil; it is used to detect leaks in respirators and to test air filtration systems.

Chemical properties:

Di(2-ethylhexyl) phthalate is insoluble in water, miscible with mineral oil and hexane, and soluble in most organic solvents. It is easily dissolved in body fluids such as saliva and plasma. Di(2-ethylhexyl) phthalate is a combustible liquid; it may burn, but does not readily ignite. It produces poisonous gas in a fire. When heated to decomposition, it emits acrid smoke.

Synonyms for di(2-ethylhexyl) phthalate are bis(2-ethylhexyl) phthalate, bis(2-ethylhexyl)-1,2-benzenedicarboxylate, di(2-ethylhexyl)ortho-phthalate, di-sec-octyl phthalate, 2-ethylhexyl phthalate, NCI-c52733, disec-octyl phthalate, 1,2-benzenedicarboxylic acid, bis(2-ethylhexyl) ester, DOP, DEHP, and octoil.

Identification:

- Chemical Name: Di(2-ethylhexyl) Phthalate
- Regulatory Name: DEHP, BIS (2-ethylhexyl) Phthalate, Di(2-ethylhexyl) Phthalate
- Formula: C24H38O4
- CAS: 117-81-7
- CHRIS: EHE

Health effects:

Di(2-ethylhexyl) phthalate is a substance which may reasonably be anticipated to be a carcinogen, according to the National Toxicology Program of the U.S. Department of Health and Human Services. It is classified as a carcinogen in EPA's Toxic Release Inventory (TRI). It is also a teratogen and may damage the testes. Repeated exposure to di(2-ethylhexyl)

phthalate may affect the kidneys and liver, and may cause numbness and tingling in the arms and legs. Exposure can occur through inhalation, ingestion or dermal contact; it may cause irritation to the eyes, nose and throat.

Exposure Values:

- IDLH: **Ca** [5000 mg/m3] (NIOSH, 1997)
- NIOSH REL: **Ca** TWA 5 mg/m3 ST 10 mg/m3
- OSHA PEL: TWA 5 mg/m^3

Economics:

U.S. manufacturers of Di(2-ethylhexyl) phthalate are Aristech Chemical Corporation, Hq, Neville Island, PA; Eastman Chemical Company, Kingsport, TN; and Velsicol Chemical Corporation, Chestertown, MD.

Regulation:

EPA regulates di(2-ethylhexyl) phthalate under the Clean Water Act; Comprehensive Environmental Response, Compensation, and Liability Act; Resource Conservation and Recovery Act; Superfund Amendments and Reauthorization Act; and Toxic Substances Control Act. EPA classifies the chemical as an air toxic listed on the Hazardous Air Pollutant List, a volatile organic compound, and a water priority pollutant.

The Food and Drug Administration (FDA) regulates di(2-ethylhexyl) phthalate as an indirect food additive. The Occupational Safety and Health Administration (OSHA) established a permissible exposure limit for di(2-ethylhexyl) phthalate of 5 mg/m3 as an eight-hour time-weighted average, and has set a short-term exposure limit of 10 mg/m3 for the chemical. OSHA also regulates di(2-ethylhexyl) phthalate under the Hazard Communication Standard and as a chemical hazard in laboratories.

Under Section 313 of the Emergency Planning and Community Right to Know Act of 1986, releases of more than one pound of di(2-ethylhexyl) phthalate into the air, water, and land must be reported annually and entered into the Toxic Release Inventory (TRI).

National Overview of 1998 Toxics Release Inventory

In 1998, 355 facilities released 1,314,634 pounds of di(2-ethylhexyl) phthalate. Of those releases, 207,795 pounds were air emissions; 669 pounds were surface water discharges; 0 pounds were released by underground injection; 24,184 pounds were released to land; and, 1,081,986 pounds were transferred off-site for disposal. Total emissions for 1998 represented an increase from 1997 emissions, which totaled 1,302,131 pounds; a decrease from 1996 emissions, which totaled 2,270,653 pounds; from 1995 emissions, which totaled 3,537,174 pounds; and from 1988 (baseline) emissions, which totaled 4,873,091 pounds.

In 1998, 10,522,031 pounds of di(2-ethylhexyl) phthalate waste were managed; 4,985,166 pounds were recycled on-site; 1,804,174 pounds were recycled off-site; 335,646 pounds were used for energy recovery on-site; 1,674,585 pounds were used for energy recovery off-site; 403,536 pounds were treated on-site; 252,953 pounds were treated off-site; and 1,065,971

pounds were released on-and off-site.

The 10 states in which the largest amounts of di(2-ethylhexyl) phthalate were released in 1998 were: OK (45,931 pounds); CT (26,885 pounds); GA (24,650 pounds); NC (23,082 pounds); MO (16,161 pounds); AL (13,500 pounds); TX (10,485 pounds); OH (9,618 pounds); TN (8,867 pounds); and NJ (8,385 pounds).

The 10 facilities releasing the largest amounts of di(2-ethylhexyl) phthalate in 1998 were: Zapata Ind. Inc., Muskogee, OK (45,921 pounds); Spongex Intl. Lt, Shelton, CT (26,800 pounds); Rotation Dynamics Corp., Covington, GA (14,303 pounds); Sinclair & Rush, Saint Louis, MO (13,783 pounds); 3M, Guin, AL (13,500 pounds); Wix Corp. Allen Plant, Gastonia, NC (11,977 pounds); Georgia Duck & Cordage Mill, Scottdale, GA (10,347 pounds); Baxter Healthcare Corp., Mountain Home, AR (7,100 pounds); Johnsonite, Chagrin Falls, OH (5,552 pounds); and Bayshore Vinyl Compounds Inc., Tennent, NJ (5,000 pounds).

Notations:

The NIOSH recommended exposure limits (**RELs**) are time-weighted average (**TWA**) concentrations for up to a 10-hour workday during a 40-hour workweek. A short-term exposure limit (**STEL**) is designated by "**ST**" preceding the value; unless noted otherwise, the STEL is a 15-minute TWA exposure that should not be exceeded at any time during a workday. A ceiling REL is designated by "**C**" preceding the value. Any substance that NIOSH considers to be a potential occupational carcinogen is designated by the notation "**Ca**."

The OSHA permissible exposure limits (**PEL**) are found in Tables Z-1, Z-2, and Z-3 of the OSHA General Industry Air Contaminants Standard (29 CFR 1910.1000). Unless noted otherwise, **PEL** are **TWA** concentrations that must not be exceeded during any 8-hour workshift of a 40-hour workweek. A **STEL** is designated by "**ST**" preceding the value and is measured over a 15-minute period unless noted otherwise. OSHA ceiling concentrations (designated by "**C**" preceding the value) must not be exceeded during any part of the workday; if instantaneous monitoring is not feasible, the ceiling must be assessed as a 15-minute TWA exposure. In addition, there are a number of substances from Table Z-2 (e.g., beryllium, ethylene dibromide, etc.) that have PEL ceiling values that must not be exceeded except for specified excursions. For example, a "5-minute maximum peak in any 2 hours" means that a 5-minute exposure above the ceiling value, but never above the maximum peak, is allowed in any 2 hours during an 8-hour workday.

Information Sources:

- CAMEO®, U.S. Environmental Protection Agency, National Oceanic and Atmospheric Administration, www.epa.gov/ceppo.
- Chemical Manufacturers Association, 1300 Wilson Blvd., Arlington, VA 22209: (703) 741-5000 or Chemical Referral Library, (800) 262-8200.
- National Institute of Environmental Health Sciences, Clearinghouse on Environmental Health Effects, 100 Capitola Drive, #108, Durham, NC 27713; (800) 643-4794; fax (919) 361-9408.
- TOXNET, National Library of Medicine, National Institutes of Health; www.toxnet.nlm.nih.gov
- U.S. Environmental Protection Agency, 401 M St., SW, Washington, DC 20460; Right to Know Hotline (800) 535-0202.
- U.S. Department of Labor, Occupational Health and Safety Administration, Washington, DC, www.osha.gov
- OSHA PEL: Z-1 Table: www.osha-slc.gov/OshStd_data/1910_1000_TABLE_Z-1.html
- OSHA PEL: Z-2 Table: www.osha-slc.gov/OshStd_data/1910_1000_TABLE_Z-2.html

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DATE COLLECTED 12/8/2004

DATE RECEIVED

SEND REPORT TO 12/9/2004

DATE REPORTED 12/21/2004

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE #	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74118	OBS Well #1	COD	<8	8	mg/L	Wang
74118	OBS Well #1	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
74118	OBS Well #1	Nitrate as Nitrogen	0.1	0.044	mg/L	Wang
74118	OBS Well #1	Chloride	ND	0.297	mg/L	Wang
74118	OBS Well #1	Soluble Reactive Phosphoru	0.06		mg/L	Wang
74118	OBS Well #1	Total Dissolved Solids	34	20.3	mg/L	Wang
74118	OBS Well #1	Fecal E-Coli	12	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
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mg/L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
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Molly Kuo for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

Dec. 22, 2004
Date

WQ-Table 1

Baseline Chemicals

Location:	OBS Well #1					
Collection Date	Sample #	Analysis	Results	Duplicates	MDL	Units
12/8/2004	74118	COD	<8	<8	8.000	mg/L
12/8/2004	74118	TKN as Nitrogen	<0.72	<0.72	0.720	mg/L
12/8/2004	74118	Nitrate as Nitrogen	0.1	0.1	0.044	mg/L
12/8/2004	74118	Chloride	ND	ND	0.297	mg/L
12/8/2004	74118	Soluble Reactive Phosphorus	0.06	0.06	0.037	mg/L
12/8/2004	74118	Total Dissolved Solids	34	34	20.300	mg/L
Location:	Intake					
Collection Date	Sample #	Analysis	Results	Duplicates	MDL	Units
12/8/2004	74117	COD	12		8.000	mg/L
12/8/2004	74117	TKN as Nitrogen	<0.72		0.720	mg/L
12/8/2004	74117	Nitrate as Nitrogen	0.1		0.044	mg/L
12/8/2004	74117	Chloride	1		0.297	mg/L
12/8/2004	74117	Soluble Reactive Phosphorus	0.02		0.037	mg/L
12/8/2004	74117	Total Dissolved Solids	24		20.300	mg/L
Location	OBS Well #1					
Collection Date	Sample #	Analysis	Results	Duplicates	MDL	Units
5/19/2005		COD	<8		8.000	mg/L
5/19/2005		TKN as Nitrogen	<0.72		0.720	mg/L
5/19/2005		Nitrate as Nitrogen	0.11		0.044	mg/L
5/19/2005		Chloride	ND		0.297	mg/L
5/19/2005		Soluble Reactive Phosphorus	0.155		0.037	mg/L
5/19/2005		Total Dissolved Solids	48		20.300	mg/L

Sampled by: Z. Gray, WWBWC

Jesuit 2004-5

WQ-Table 2
Fecal E. Coli Sampling Results

Date	Time	Location	Results	What	Collector
12/1/2004	11:05	GW-16	3	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:25	HBDIC OBS#3 (A)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:10	GW-61	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	11:25	GW-28	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	13:15	GW-17	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:25	HBDIC OBS #3(B)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	11:45	GW-14	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	13:05	GW-39	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	11:40	White Ditch #1 (Frog)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	13:05	White Ditch#3 (Prunesdale Road)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:40	HBDIC OBS #1	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:50	HBDIC Intake (B)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:50	HBDIC Intake (A)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:55	HBDIC OBS #4	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:40	HBDIC OBS #1B	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	11:35	White Ditch #2 (Winesap Road)	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:35	HBDIC OBS #2	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	11:55	GW-9	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:05	GW-60	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
12/8/2004	14:00	HBDIC OBS #1	12	Fecal E-Coli (MPN/100 ML)	Z Gray
12/8/2004	14:15	HBDIC Intake	62	Fecal E-Coli (MPN/100 ML)	Z Gray
1/5/2005	12:05	HBDIC OBS #1	2	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:20	GW-62	11	Fecal E-Coli (MPN/100 ML)	Z Gray
4/6/2005	11:25	HBDIC Intake	4	Fecal E-Coli (MPN/100 ML)	Z Gray
	11:40	HBDIC OBS #1	1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:00	GW-40	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
	12:10	GW-62	<1	Fecal E-Coli (MPN/100 ML)	Z Gray
		GW-62	2	Fecal E-Coli (MPN/100 ML)	Z Gray
5/19/2005	N/A	HBDIC OBS #1	5	Fecal E-Coli (MPN/100 ML)	Z Gray

Synthetic Organic Compound Analysis: 2004-5

Collection Date	Sample #	Reference #	Analysis	DOH#	Compounds	Results	Units	SRL	Trigger	MCL	Comments
					Carbamates in Drinking water						
12/8/2004	74116	04-12075	SOC/Synthetic Organic Co	146	Carbofuran	ND	ug/L	1.800	1.800	40.0	EPA Regulated
				148	Oxymal	ND	ug/L	4.000	4.000	200.0	EPA Regulated
				141	3-Hydroxycarbofuran	ND	ug/L	2.000	2.000		EPA Unregulated
				142	Aldicarb	ND	ug/L	1.000	1.000		EPA Unregulated
				143	Aldicarb Sulfone	ND	ug/L	1.600	1.600		EPA Unregulated
				144	Aldicarb Sulfoxide	ND	ug/L	1.000	1.000		EPA Unregulated
				145	Carbaryl	ND	ug/L	2.000	2.000		EPA Unregulated
				147	Methomyl	ND	ug/L	1.000	4.000		EPA Unregulated
				326	Propoxur(Baygon)	ND	ug/L	1.000			State Unregulated
				327	Methiocarb	ND	ug/L	4.000			State Unregulated
					Synthetic Organic Compounds						
				33	Endrin	ND	ug/L	0.020	0.020	2.0	EPA Regulated
				34	Lindane (BHC-Gamma)	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				35	Methoxychlor	ND	ug/L	0.200	0.200	40.0	EPA Regulated
				117	Alachlor	ND	ug/L	0.400	0.400	2.0	EPA Regulated
				119	Atrazine	ND	ug/L	0.200	0.200	3.0	EPA Regulated
				120	Benzo(a)pyrene	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				122	Chlordane Technical	ND	ug/L	0.400	0.400	2.0	EPA Regulated
				124	Di(ethylhexyl)-Adipate	ND	ug/L	1.300	1.300	400.0	EPA Regulated
				125	Di(ethylhexyl)-phthalate	ND	ug/L	1.300	1.300	6.0	EPA Regulated
				126	Heptachlor	ND	ug/L	0.080	0.080	0.4	EPA Regulated
				127	Heptachlor epoxide (A & B)	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				128	Hexachlorobenzene	ND	ug/L	0.200	0.200	1.0	EPA Regulated
				129	Hexachlorocyclo-Pentadiene	ND	ug/L	0.200	0.200	50.0	EPA Regulated
				133	Simazine	ND	ug/L	0.150	0.150	4.0	EPA Regulated
				118	Aldrin	ND	ug/L	0.200	0.200		EPA Unregulated
				121	Butachlor	ND	ug/L	0.400	0.400		EPA Unregulated
				123	Dieldrin	ND	ug/L	0.200	0.200		EPA Unregulated
				130	Metolachlor	ND	ug/L	1.000	1.000		EPA Unregulated
				131	Metribuzin	ND	ug/L	0.200	0.200		EPA Unregulated
				132	Propachlor	ND	ug/L	0.200	0.200		EPA Unregulated
				179	Bromacil	ND	ug/L	0.200	0.200		State Unregulated
				183	Prometon	ND	ug/L	0.200	0.200		State Unregulated
				190	Terbacil	ND	ug/L	0.200	0.200		State Unregulated
				202	Diazinon	ND	ug/L	0.200	0.200		State Unregulated
				208	EPTC	ND	ug/L	0.300	0.300		State Unregulated
				232	4,4-DDD	ND	ug/L	0.200	0.200		State Unregulated
				233	4,4-DDE	ND	ug/L	0.200	0.200		State Unregulated
				234	4,4_DDT	ND	ug/L	0.200	0.200		State Unregulated
				236	Cyanazine	ND	ug/L	0.200	0.200		State Unregulated
				239	Malathion	ND	ug/L	0.200	0.200		State Unregulated
				240	Parathion	ND	ug/L	0.200	0.200		State Unregulated
				243	Trifluralin	ND	ug/L	0.200	0.200		State Unregulated
				96	Napthalene	ND	ug/L	0.100	0.100		PAHs
				154	Fluorene	ND	ug/L	0.200	0.200		PAHs
				244	Acenaphthylene	ND	ug/L	0.200	0.200		PAHs
				245	Acenaphthene	ND	ug/L	0.200	0.200		PAHs
				246	Anthracene	ND	ug/L	0.200	0.200		PAHs
				247	Benz(a)anthracene	ND	ug/L	0.100	0.100		PAHs
				248	Benzo(b)fluoranthene	ND	ug/L	0.200	0.200		PAHs
				249	Benzo(g,h,i)perylene	ND	ug/L	0.200	0.200		PAHs
				250	Benzo(k)fluoranthene	ND	ug/L	0.200	0.200		PAHs
				251	Chrysene	ND	ug/L	0.200	0.200		PAHs
				252	Dibenzo(A,H)anthracene	ND	ug/L	0.200	0.200		PAHs
				253	Fluoranthene	ND	ug/L	0.200	0.200		PAHs
				255	Indeno(1,2,3-CD)Pyrene	ND	ug/L	0.200	0.200		PAHs
				256	Phenanthrene	ND	ug/L	0.200	0.200		PAHs
				257	Pyrene	ND	ug/L	0.200	0.200		PAHs
				258	Benzyl Butyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				259	Di-N-Butyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				260	Diethyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				261	Dimethyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				36	Toxaphene	ND	ug/L	2.000	2.000	3.0	PCBs/Tocxaphene
				173	Aroclor 1221	ND	ug/L	20.000	20.000		PCBs/Tocxaphene
				174	Aroclor 1232	ND	ug/L	0.500	0.500		PCBs/Tocxaphene
				175	Aroclor 1242	ND	ug/L	0.500	0.300		PCBs/Tocxaphene
				176	Aroclor 1248	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
				177	Aroclor 1254	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
				178	Aroclor 1260	ND	ug/L	0.200	0.200		PCBs/Tocxaphene
				180	Aroclor 1016	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
					Herbicides in Drinking Water						
				37	2,4-D	ND	ug/L	0.200	0.200	70.0	EPA Regulated
				38	2,4,5-TP (Silvex)	ND	ug/L	0.400	0.400	50.0	EPA Regulated
				134	Pentachlorophenol	ND	ug/L	0.080	0.080	1.0	EPA Regulated
				137	Dalapon	ND	ug/L	2.000	2.000	200.0	EPA Regulated
				139	Dinoseb	ND	ug/L	0.400	0.400	7.0	EPA Regulated
				140	Picloram	ND	ug/L	0.200	0.200	500.0	EPA Regulated
				138	Dicamba	ND	ug/L	0.200	0.200		EPA Unregulated
				135	2,4 DB	ND	ug/L	1.000	1.000		State Unregulated
				136	2,4,5 T	ND	ug/L	0.400	0.400		State Unregulated
				220	Bentazon	ND	ug/L	0.500	0.500		State Unregulated
				221	Dichloroprop	ND	ug/L	0.500	0.500		State Unregulated
				223	Actiflorfin	ND	ug/L	2.000	2.000		State Unregulated
				225	Dacthal (DCPA)	ND	ug/L	0.100	0.100		State Unregulated
				226	3,5-Dichlorobenzoic Acid	ND	ug/L	0.500	0.500		State Unregulated

Synthetic Organic Compound Analysis: 2004-5

Collection Date	Sample #	Reference #	Analysis	DOH#	Compounds	Results	Units	SRL	Trigger	MCL	Comments
					Carbamates in Drinking water						
12/8/2004	74115	04-12075	SOC/Synthetic Organic Co	146	Carbofuran	ND	ug/L	1.800	1.800	40.0	EPA Regulated
				148	Oxymal	ND	ug/L	4.000	4.000	200.0	EPA Regulated
				141	3-Hydroxycarbofuran	ND	ug/L	2.000	2.000		EPA Unregulated
				142	Aldicarb	ND	ug/L	1.000	1.000		EPA Unregulated
				143	Aldicarb Sulfone	ND	ug/L	1.600	1.600		EPA Unregulated
				144	Aldicarb Sulfoxide	ND	ug/L	1.000	1.000		EPA Unregulated
				145	Carbaryl	ND	ug/L	2.000	2.000		EPA Unregulated
				147	Methomyl	ND	ug/L	1.000	4.000		EPA Unregulated
				326	Propoxur(Baygon)	ND	ug/L	1.000			State Unregulated
				327	Methiocarb	ND	ug/L	4.000			State Unregulated
					Synthetic Organic Compounds						
				33	Endrin	ND	ug/L	0.020	0.020	2.0	EPA Regulated
				34	Lindane (BHC-Gamma)	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				35	Methoxychlor	ND	ug/L	0.200	0.200	40.0	EPA Regulated
				117	Alachlor	ND	ug/L	0.400	0.400	2.0	EPA Regulated
				119	Atrazine	ND	ug/L	0.200	0.200	3.0	EPA Regulated
				120	Benzo(a)pyrene	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				122	Chlordane Technical	ND	ug/L	0.400	0.400	2.0	EPA Regulated
				124	Di(ethylhexyl)-Adipate	ND	ug/L	1.300	1.300	400.0	EPA Regulated
				125	Di(ethylhexyl)-phthalate	ND	ug/L	1.300	1.300	6.0	EPA Regulated
				126	Heptachlor	ND	ug/L	0.080	0.080	0.4	EPA Regulated
				127	Heptachlor epoxide (A & B)	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				128	Hexachlorobenzene	ND	ug/L	0.200	0.200	1.0	EPA Regulated
				129	Hexachlorocyclo-Pentadiene	ND	ug/L	0.200	0.200	50.0	EPA Regulated
				133	Simazine	ND	ug/L	0.150	0.150	4.0	EPA Regulated
				118	Aldrin	ND	ug/L	0.200	0.200		EPA Unregulated
				121	Butachlor	ND	ug/L	0.400	0.400		EPA Unregulated
				123	Dieldrin	ND	ug/L	0.200	0.200		EPA Unregulated
				130	Metolachlor	ND	ug/L	1.000	1.000		EPA Unregulated
				131	Metribuzin	ND	ug/L	0.200	0.200		EPA Unregulated
				132	Propachlor	ND	ug/L	0.200	0.200		EPA Unregulated
				179	Bromacil	ND	ug/L	0.200	0.200		State Unregulated
				183	Prometon	ND	ug/L	0.200	0.200		State Unregulated
				190	Terbacil	ND	ug/L	0.200	0.200		State Unregulated
				202	Diazinon	ND	ug/L	0.200	0.200		State Unregulated
				208	EPTC	ND	ug/L	0.300	0.300		State Unregulated
				232	4,4-DDD	ND	ug/L	0.200	0.200		State Unregulated
				233	4,4-DDE	ND	ug/L	0.200	0.200		State Unregulated
				234	4,4_DDT	ND	ug/L	0.200	0.200		State Unregulated
				236	Cyanazine	ND	ug/L	0.200	0.200		State Unregulated
				239	Malathion	ND	ug/L	0.200	0.200		State Unregulated
				240	Parathion	ND	ug/L	0.200	0.200		State Unregulated
				243	Trifluralin	ND	ug/L	0.200	0.200		State Unregulated
				96	Napthalene	ND	ug/L	0.100	0.100		PAHs
				154	Fluorene	ND	ug/L	0.200	0.200		PAHs
				244	Acenaphthylene	ND	ug/L	0.200	0.200		PAHs
				245	Acenaphthene	ND	ug/L	0.200	0.200		PAHs
				246	Anthracene	ND	ug/L	0.200	0.200		PAHs
				247	Benz(a)anthracene	ND	ug/L	0.100	0.100		PAHs
				248	Benzo(b)fluoranthene	ND	ug/L	0.200	0.200		PAHs
				249	Benzo(g,h,i)perylene	ND	ug/L	0.200	0.200		PAHs
				250	Benzo(k)fluoranthene	ND	ug/L	0.200	0.200		PAHs
				251	Chrysene	ND	ug/L	0.200	0.200		PAHs
				252	Dibenzo(A,H)anthracene	ND	ug/L	0.200	0.200		PAHs
				253	Fluoranthene	ND	ug/L	0.200	0.200		PAHs
				255	Indeno(1,2,3-CD)Pyrene	ND	ug/L	0.200	0.200		PAHs
				256	Phenanthrene	ND	ug/L	0.200	0.200		PAHs
				257	Pyrene	ND	ug/L	0.200	0.200		PAHs
				258	Benzyl Butyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				259	Di-N-Butyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				260	Diethyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				261	Dimethyl Phthalate	ND	ug/L	0.600	0.600		Phthalates
				36	Toxaphene	ND	ug/L	2.000	2.000	3.0	PCBs/Tocxaphene
				173	Aroclor 1221	ND	ug/L	20.000	20.000		PCBs/Tocxaphene
				174	Aroclor 1232	ND	ug/L	0.500	0.500		PCBs/Tocxaphene
				175	Aroclor 1242	ND	ug/L	0.500	0.300		PCBs/Tocxaphene
				176	Aroclor 1248	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
				177	Aroclor 1254	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
				178	Aroclor 1260	ND	ug/L	0.200	0.200		PCBs/Tocxaphene
				180	Aroclor 1016	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
					Herbicides in Drinking Water						
				37	2,4-D	ND	ug/L	0.200	0.200	70.0	EPA Regulated
				38	2,4,5-TP (Silvex)	ND	ug/L	0.400	0.400	50.0	EPA Regulated
				134	Pentachlorophenol	ND	ug/L	0.080	0.080	1.0	EPA Regulated
				137	Dalapon	ND	ug/L	2.000	2.000	200.0	EPA Regulated
				139	Dinoseb	ND	ug/L	0.400	0.400	7.0	EPA Regulated
				140	Picloram	ND	ug/L	0.200	0.200	500.0	EPA Regulated
				138	Dicamba	ND	ug/L	0.200	0.200		EPA Unregulated
				135	2,4 DB	ND	ug/L	1.000	1.000		State Unregulated
				136	2,4,5 T	ND	ug/L	0.400	0.400		State Unregulated
				220	Bentazon	ND	ug/L	0.500	0.500		State Unregulated
				221	Dichloroprop	ND	ug/L	0.500	0.500		State Unregulated
				223	Actiflorfin	ND	ug/L	2.000	2.000		State Unregulated
				225	Dacthal (DCPA)	ND	ug/L	0.100	0.100		State Unregulated
				226	3,5-Dichlorobenzoic Acid	ND	ug/L	0.500	0.500		State Unregulated

Synthetic Organic Compound Analysis: 2004-5

Collection Date	Sample #	Reference #	Analysis	DOH#	Compounds	Results	Units	SRL	Trigger	MCL	Comments
					Carbamates in Drinking water						
5/19/2005	76494	05-05830	SOC/Synthetic Organic Co	146	Carbofuran	ND	ug/L	1.800	1.800	40.0	EPA Regulated
				148	Oxymal	ND	ug/L	4.000	4.000	200.0	EPA Regulated
				141	3-Hydroxycarbofuran	ND	ug/L	2.000	2.000		EPA Unregulated
				142	Aldicarb	ND	ug/L	1.000	1.000		EPA Unregulated
				143	Aldicarb Sulfone	ND	ug/L	1.600	1.600		EPA Unregulated
				144	Aldicarb Sulfoxide	ND	ug/L	1.000	1.000		EPA Unregulated
				145	Carbaryl	ND	ug/L	2.000	2.000		EPA Unregulated
				147	Methomyl	ND	ug/L	1.000	4.000		EPA Unregulated
				326	Propoxur(Baygon)	ND	ug/L	1.000			State Unregulated
				327	Methiocarb	ND	ug/L	4.000			State Unregulated
					Synthetic Organic Compounds						
				33	Endrin	ND	ug/L	0.020	0.020	2.0	EPA Regulated
				34	Lindane (BHC-Gamma)	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				35	Methoxychlor	ND	ug/L	0.200	0.200	40.0	EPA Regulated
				117	Alachlor	ND	ug/L	0.400	0.400	2.0	EPA Regulated
				119	Atrazine	ND	ug/L	0.200	0.200	3.0	EPA Regulated
				120	Benzo(a)pyrene	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				122	Chlordane Technical	ND	ug/L	0.400	0.400	2.0	EPA Regulated
				124	Di(ethylhexyl)-Adipate	ND	ug/L	1.300	1.300	400.0	EPA Regulated
				125	Di(ethylhexyl)-phthalate	ND	ug/L	1.300	1.300	6.0	EPA Regulated
				126	Heptachlor	ND	ug/L	0.080	0.080	0.4	EPA Regulated
				127	Heptachlor epoxide (A & B)	ND	ug/L	0.040	0.040	0.2	EPA Regulated
				128	Hexachlorobenzene	ND	ug/L	0.200	0.200	1.0	EPA Regulated
				129	Hexachlorocyclo-Pentadiene	ND	ug/L	0.200	0.200	50.0	EPA Regulated
				133	Simazine	ND	ug/L	0.150	0.150	4.0	EPA Regulated
				118	Aldrin	ND	ug/L	0.200	0.200		EPA Unregulated
				121	Butachlor	ND	ug/L	0.400	0.400		EPA Unregulated
				123	Dieldrin	ND	ug/L	0.200	0.200		EPA Unregulated
				130	Metolachlor	ND	ug/L	1.000	1.000		EPA Unregulated
				131	Metribuzin	ND	ug/L	0.200	0.200		EPA Unregulated
				132	Propachlor	ND	ug/L	0.200	0.200		EPA Unregulated
				179	Bromacil	ND	ug/L	0.200	0.200		State Unregulated
				183	Prometon	ND	ug/L	0.200	0.200		State Unregulated
				190	Terbacil	ND	ug/L	0.200	0.200		State Unregulated
				202	Diazinon	ND	ug/L	0.200	0.200		State Unregulated
				208	EPTC	ND	ug/L	0.300	0.300		State Unregulated
				232	4,4-DDD	ND	ug/L	0.200	0.200		State Unregulated
				233	4,4-DDE	ND	ug/L	0.200	0.200		State Unregulated
				234	4,4_DDT	ND	ug/L	0.200	0.200		State Unregulated
				236	Cyanazine	ND	ug/L	0.200	0.200		State Unregulated
				239	Malathion	ND	ug/L	0.200	0.200		State Unregulated
				240	Parathion	ND	ug/L	0.200	0.200		State Unregulated
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				177	Aroclor 1254	ND	ug/L	0.100	0.100		PCBs/Tocxaphene
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				37	2,4-D	ND	ug/L	0.200	0.200	70.0	EPA Regulated
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				225	Dacthal (DCPA)	ND	ug/L	0.100	0.100		State Unregulated
				226	3,5-Dichlorobenzoic Acid	ND	ug/L	0.500	0.500		State Unregulated

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED 12/8/2004 DATE RECEIVED 12/9/2004 DATE REPORTED 12/23/2004

SYSTEM CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSIS
74117	Intake	COD	12	8	mg/L	Wang
74117	Intake	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
74117	Intake	Nitrate as Nitrogen	0.1	0.044	mg/L	Wang
74117	Intake	Chloride	1.00	0.297	mg/L	Wang
74117	Intake	Soluble Reactive Phosphoru	0.02		mg/L	Wang
74117	Intake	Total Disolved Solids	24	20.3	mg/L	Wang
74117	Intake	Fecal E-Coli	62	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL-Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Molly Lee for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

Dec. 28, 2004
Date

OCT-26-05 WED 9:39 AM KUO TESTINGLABSINC FAX NO. 5094886865 P. 1

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 12/8/2004
DATE RECEIVED:
SYSTEM CUSTOMER:
SEND REPORT TO: 12/9/2004
DUE DATE: 12/23/2004

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74117	Intake	COD	12	8	mg/L	Wang
74117	Intake	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
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74117	Intake	Chloride	1.00	0.297	mg/L	Wang
74117	Intake	Soluble Reactive Phosphoru	0.02		mg/L	Wang
74117	Intake	Total Disolved Solids	24	20.3	mg/L	Wang
74117	Intake	Fecal E-Coli	62	1	MPN/100mL	Valley Enviornment

<(0.001): indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
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* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Molly Lee for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

Dec. 28, 2004
Date

OCT-26-05 WED 9:32 AM KUO TESTINGLABSINC FAX NO. 5094886865 P. 1

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 12/8/2004 | DATE RECEIVED: 12/9/2004 | SEND REPORT TO: | DATE REPORTED: 12/21/2004

SYSTEM / CUSTOMER:

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862

Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYST
74118	OBS Well #1	COD	<8	8	mg/L	Wang
74118	OBS Well #1	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
74118	OBS Well #1	Nitrate as Nitrogen	0.1	0.044	mg/L	Wang
74118	OBS Well #1	Chloride	ND	0.297	mg/L	Wang
74118	OBS Well #1	Soluble Reactive Phosphoru	0.06		mg/L	Wang
74118	OBS Well #1	Total Dissolved Solids	34	20.3	mg/L	Wang
74118	OBS Well #1	Fecal E-Coli	12	1	MPN/100mL	Valley Enviornment

<(0.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Molly Quinn for Eugene
Dr. Eugene Kuo, Quality Assurance Coordinator

Dec. 22, 2004
Date

OCT-26-05 WED 9:40 AM KUO TESTINGLABSINC FAX NO. 5094888865 P. 2

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 5/19/2005
DATE RECEIVED: 5/20/2005
DATE REPORTED: 6/2/2005

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

SEND REPORT TO:
Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
76493	OBS #1	Total Dissolved Solids	48	20.3	mg/L	Wang
76493	OBS #1	Nitrate as Nitrogen	0.11	0.044	mg/L	Wang
76493	OBS #1	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
76493	OBS #1	COD	<8	8	mg/L	Wang
76493	OBS #1	Chloride	ND	0.297	mg/L	Wang
76493	OBS #1	SRP-(Othro-P)	0.155	0.03	mg/L	Wang

(0.001): indicates the analyte was not detected at or above the concentration indicated.
None Detected
L:Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

06-09-05
Date

Appendices I-C

HBDIC Recharge Water Quality Testing:

Lab Results, Notes and Records

2005-2006 Recharge Season

Samples #1/2

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 1/4/2006
DATE RECEIVED: SEND REPORT TO: 1/5/2006
DATE REPORTED: 1/13/2006

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
80260	Intake	Orthophosphate as P (SRP)	0.06	0.0433	mg/L	Wang
80260	Intake	Total Dissolved Solids	50	21.1	mg/L	Wang
80260	Intake	Nitrate as Nitrogen	0.47	0.084	mg/L	Wang
80260	Intake	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
80260	Intake	COD	8	8	mg/L	Wang
80260	Intake	Chloride	ND	0.297	mg/L	Wang

<(0.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

01-13-06
Date

Kuo Testing Labs, Inc.

337 South 1st Avenue, Othello, WA 99344
(509) 488-0112 Phone (509) 488-0118 Fax (800) 328-0112 Toll Free
Web Site: http://www.kuotesting.com e-mail: kuotest@atnet.net

DATE COLLECTED: 1/4/2006
DATE RECEIVED: 1/5/2006
DATE REPORTED: 1/13/2006
SEND REPORT TO:

SYSTEM / CUSTOMER

W.W.B.W.C.
PO Box 68
Milton Freewater OR 97862
Project Name:

Bob Bower
PO Box 68
Milton Freewater OR 97862
Attn:

SAMPLE NO.	CUSTOMER SAMPLE NO.	ANALYSIS	RESULTS	MDL	UNITS	ANALYSTS
80261	HBDIC OBS #1	Orthophosphate as P (SRP)	0.07	0.0433	mg/L	Wang
80261	HBDIC OBS #1	Total Dissolved Solids	72	21.1	mg/L	Wang
80261	HBDIC OBS #1	Nitrate as Nitrogen	0.64	0.084	mg/L	Wang
80261	HBDIC OBS #1	TKN as Nitrogen	<0.72	0.72	mg/L	Wang
80261	HBDIC OBS #1	COD	10	8	mg/L	Wang
80261	HBDIC OBS #1	Chloride	ND	0.297	mg/L	Wang

<(0.001): Indicates the analyte was not detected at or above the concentration indicated.
ND: None Detected
mg/L: Indicates milligrams per litre
* PQL=Practical Quantitation Limit is the lowest level that can be achieved within specified limits of precision and accuracy during routine laboratory operating conditions
MDL: Method Detection Limit
Please check out our new Web Site at http://www.kuotesting.com

Dr. Eugene Kuo, Quality Assurance Coordinator

01-13-06
Date

Sample #1/2

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January 18, 2006

Bob Bower
Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

RE: 06-00222 - HBDIC Recharge Project

Dear Bob Bower,

Your project: HBDIC Recharge Project, was received on Friday January 06, 2006.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

L. J. Henderson, PhD
Laboratory Director

Enclosures Data Report
QC Reports
Chain of Custody

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INVOICE

Client No: WAL06

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 S MAIN STREET
MILTON-FREEWATER, OR 97862

Attn: Bob Bower

Please include this number with payment

Reference: **06-00222**
Date: January 19, 2006
Project: HBDIC Recharge Project
Date Received: January 06, 2006
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	449.00	Intake	HBDIC Recharge Project (WWBWC)	Synthetic Organics	$590.00
2	449.01	Intake	HBDIC Recharge Project (WWBWC)	Chlorophenoxy Herbicides	
3	449.02	Intake	HBDIC Recharge Project (WWBWC)	Carbamates	
4	450.00	OBS well #1	HBDIC Recharge Project (WWBWC)	Synthetic Organics	$590.00
5	450.01	OBS well #1	HBDIC Recharge Project (WWBWC)	Chlorophenoxy Herbicides	
6	450.02	OBS well #1	HBDIC Recharge Project (WWBWC)	Carbamates	
7	450.03	OBS well #1	HBDIC Recharge Project (WWBWC)	SHIPPING CHARGE	$5.00

Grand Total: $1,185.00
Amount Paid: $0.00
Amount Due: $1,185.00

Thank You for Your Business

Please pay by February 18, 2006 to avoid a 1.5% per month finance charge.

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: Intake
Lab Number: 04600449
Date Collected: 1/4/2006
Date Extracted: 515_060110
Date Analyzed: 1/11/2006
Report Date: 1/16/2006
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	**ND**	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	**ND**	ug/L	0.08	0.08	1	
137	DALAPON	**ND**	ug/L	2	2	200	
139	DINOSEB	**ND**	ug/L	0.4	0.4	7	
140	PICLORAM	**ND**	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	**ND**	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	**ND**	ug/L	1.0	1.0		
136	2,4,5 T	**ND**	ug/L	0.4	0.4		
220	BENTAZON	**ND**	ug/L	0.5	0.5		
221	DICHLORPROP	**ND**	ug/L	0.5	0.5		
223	ACTIFLORFIN	**ND**	ug/L	2.0	2.0		
225	DACTHAL (DCPA)	**ND**	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

FORM: SOC97

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: OBS well #1
Lab Number: 04600450
Date Collected: 1/4/2006
Date Extracted: 515_060110
Date Analyzed: 1/11/2006
Report Date: 1/16/2006
Analyst: CMH
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	**ND**	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	**ND**	ug/L	0.08	0.08	1	
137	DALAPON	**ND**	ug/L	2	2	200	
139	DINOSEB	**ND**	ug/L	0.4	0.4	7	
140	PICLORAM	**ND**	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	**ND**	ug/L	0.2	0.2		
	State Unregulated						
135	2,4 DB	**ND**	ug/L	1.0	1.0		
136	2,4,5 T	**ND**	ug/L	0.4	0.4		
220	BENTAZON	**ND**	ug/L	0.5	0.5		
221	DICHLORPROP	**ND**	ug/L	0.5	0.5		
223	ACTIFLORFIN	**ND**	ug/L	2.0	2.0		
225	DACTHAL (DCPA)	**ND**	ug/L	0.1	0.1		
226	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
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J - Estimated value.

FORM: SOC97

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: Intake
Lab Number: 04600449
Date Collected: 1/4/2006
Date Extracted: 525_060110
Date Analyzed: 1/11/2006
Report Date: 1/13/2006
Analyst: MM
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
	HEPTACHLOR EPOXIDE "B"	ND	ug/L	0.02		0.2	
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1.0	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		Qualitative Analysis Only
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		Unstable in Acidified Sample Matrix
208	EPTC	ND	ug/L	0.3	0.3		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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Reference Number: 06-00222
Lab Number: 04600449
Report Date: 1/13/2006

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
232	4,4-DDD	ND	ug/L	0.2	0.2		
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		Qualitative Analysis Only
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

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J - Estimated value.

FORM: SOC97

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: OBS well #1
Lab Number: 04600450
Date Collected: 1/4/2006
Date Extracted: 525_060110
Date Analyzed: 1/11/2006
Report Date: 1/13/2006
Analyst: MM
Supervisor:

EPA Method 525.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
	HEPTACHLOR EPOXIDE "B"	ND	ug/L	0.02		0.2	
33	ENDRIN	ND	ug/L	0.02	0.02	2	
34	LINDANE (BHC - GAMMA)	ND	ug/L	0.04	0.04	0.2	
35	METHOXYCHLOR	ND	ug/L	0.2	0.2	40	
117	ALACHLOR	ND	ug/L	0.4	0.4	2	
119	ATRAZINE	ND	ug/L	0.2	0.2	3	
120	BENZO(A)PYRENE	ND	ug/L	0.04	0.04	0.2	
122	CHLORDANE, TECHNICAL	ND	ug/L	0.4	0.4	2	
124	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	1.3	1.3	400	
125	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	1.3	1.3	6	
126	HEPTACHLOR	ND	ug/L	0.08	0.08	0.4	
128	HEXACHLOROBENZENE	ND	ug/L	0.2	0.2	1	
129	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.2	0.2	50	
133	SIMAZINE	ND	ug/L	0.15	0.15	4	
	EPA Unregulated						
118	ALDRIN	ND	ug/L	0.2	0.2		
121	BUTACHLOR	ND	ug/L	0.4	0.4		
123	DIELDRIN	ND	ug/L	0.2	0.2		
130	METOLACHLOR	ND	ug/L	1.0	1.0		
131	METRIBUZIN	ND	ug/L	0.2	0.2		
132	PROPACHLOR	ND	ug/L	0.2	0.2		
	State Unregulated - Other						
179	BROMACIL	ND	ug/L	0.2	0.2		
183	PROMETON	ND	ug/L	0.2	0.2		Qualitative Analysis Only
190	TERBACIL	ND	ug/L	0.2	0.2		
202	DIAZINON	ND	ug/L	0.2	0.2		Unstable in Acidified Sample Matrix
208	EPTC	ND	ug/L	0.3	0.3		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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Reference Number: 06-00222
Lab Number: 04600450
Report Date: 1/13/2006

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
232	4,4-DDD	ND	ug/L	0.2	0.2		
233	4,4-DDE	ND	ug/L	0.2	0.2		
234	4,4-DDT	ND	ug/L	0.2	0.2		
236	CYANAZINE	ND	ug/L	0.2	0.2		Qualitative Analysis Only
239	MALATHION	ND	ug/L	0.2	0.2		
240	PARATHION	ND	ug/L	0.2	0.2		
243	TRIFLURALIN	ND	ug/L	0.2	0.2		
	- PAHs						
96	NAPTHALENE	ND	ug/L	0.1	0.1		
154	FLUORENE	ND	ug/L	0.2	0.2		
244	ACENAPHTHYLENE	ND	ug/L	0.2	0.2		
245	ACENAPHTHENE	ND	ug/L	0.2	0.2		
246	ANTHRACENE	ND	ug/L	0.2	0.2		
247	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.1		
248	BENZO(B)FLUORANTHENE	ND	ug/L	0.2	0.2		
249	BENZO(G,H,I)PERYLENE	ND	ug/L	0.2	0.2		
250	BENZO(K)FLUORANTHENE	ND	ug/L	0.2	0.2		
251	CHRYSENE	ND	ug/L	0.2	0.2		
252	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.2	0.2		
253	FLUORANTHENE	ND	ug/L	0.2	0.2		
255	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.2	0.2		
256	PHENANTHRENE	ND	ug/L	0.2	0.2		
257	PYRENE	ND	ug/L	0.2	0.2		
	- Phthalates						
258	BENZYL BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
259	DI-N-BUTYL PHTHALATE	ND	ug/L	0.6	0.6		
260	DIETHYL PHTHALATE	ND	ug/L	0.6	0.6		
261	DIMETHYL PHTHALATE	ND	ug/L	0.6	0.6		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
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J - Estimated value.

FORM: SOC97

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: Intake
Lab Number: 04600449
Date Collected: 1/4/2006
Date Extracted: 508_060110
Date Analyzed: 1/10/2006
Report Date: 1/11/2006
Analyst: MM
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	**ND**	ug/L	2	2	3	
173	AROCLOR 1221	**ND**	ug/L	20	20		
174	AROCLOR 1232	**ND**	ug/L	0.5	0.5		
175	AROCLOR 1242	**ND**	ug/L	0.5	0.3		
176	AROCLOR 1248	**ND**	ug/L	0.1	0.1		
177	AROCLOR 1254	**ND**	ug/L	0.1	0.1		
178	AROCLOR 1260	**ND**	ug/L	0.2	0.2		
180	AROCLOR 1016	**ND**	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: OBS well #1
Lab Number: 04600450
Date Collected: 1/4/2006
Date Extracted: 508_060110
Date Analyzed: 1/10/2006
Report Date: 1/11/2006
Analyst: MM
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
36	TOXAPHENE	**ND**	ug/L	2	2	3	
173	AROCLOR 1221	**ND**	ug/L	20	20		
174	AROCLOR 1232	**ND**	ug/L	0.5	0.5		
175	AROCLOR 1242	**ND**	ug/L	0.5	0.3		
176	AROCLOR 1248	**ND**	ug/L	0.1	0.1		
177	AROCLOR 1254	**ND**	ug/L	0.1	0.1		
178	AROCLOR 1260	**ND**	ug/L	0.2	0.2		
180	AROCLOR 1016	**ND**	ug/L	0.1	0.1		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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J - Estimated value.

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: Intake
Lab Number: 04600449
Date Collected: 1/4/2006
Date Extracted: 531_060111
Date Analyzed: 1/11/2006
Report Date: 1/18/2006
Analyst: TW
Supervisor:

EPA Method 531.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	**ND**	ug/L	1.8	1.8	40	
148	OXYMAL	**ND**	ug/L	4.0	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	**ND**	ug/L	2.0	2.0		
142	ALDICARB	**ND**	ug/L	1.0	1.0		
143	ALDICARB SULFONE	**ND**	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	1.0		
145	CARBARYL	**ND**	ug/L	2.0	2.0		
147	METHOMYL	**ND**	ug/L	1.0	1.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	**ND**	ug/L	1.0			
327	METHIOCARB	**ND**	ug/L	4.0			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: HBDIC Recharge Project (WWBWC)
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: OBS well #1
Lab Number: 04600450
Date Collected: 1/4/2006
Date Extracted: 531_060111
Date Analyzed: 1/11/2006
Report Date: 1/18/2006
Analyst: TW
Supervisor:

EPA Method 531.2 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
146	CARBOFURAN	**ND**	ug/L	1.8	1.8	40	
148	OXYMAL	**ND**	ug/L	4.0	4.0	200	
	EPA Unregulated						
141	3-HYDROXYCARBOFURAN	**ND**	ug/L	2.0	2.0		
142	ALDICARB	**ND**	ug/L	1.0	1.0		
143	ALDICARB SULFONE	**ND**	ug/L	1.6	1.6		
144	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	1.0		
145	CARBARYL	**ND**	ug/L	2.0	2.0		
147	METHOMYL	**ND**	ug/L	1.0	1.0		
	State Unregulated - Other						
326	PROPOXUR (BAYGON)	**ND**	ug/L	1.0			
327	METHIOCARB	**ND**	ug/L	4.0			

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
508_060110						
449	TETRACHLORO-M-XYLENE (SURR)	99		%	508.1	Acceptance Range is 42% to 137%
525_060110						
449	1,3-DIMETHYL-2-NITROBENZENE (Surr)	83		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	92		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	98		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	93		%		Acceptance Range is 70% to 130%
515_060110						
449	2,4 - DCAA (SURR)	119		%	515.1	Acceptance Range is 60% to 140%
508_060110						
450	TETRACHLORO-M-XYLENE (SURR)	90		%	508.1	Acceptance Range is 42% to 137%
525_060110						
450	1,3-DIMETHYL-2-NITROBENZENE (Surr)	86		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	93		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	99		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	92		%		Acceptance Range is 70% to 130%
515_060110						
450	2,4 - DCAA (SURR)	102		%	515.1	Acceptance Range is 60% to 140%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

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QUALITY CONTROL REPORT
BLANK REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Batch	Analyte	Result	Units	Limit	QC Qualifier	Method	Type*	Comments
508_060110	AROCLOR 1221	ND	ug/L	0.12		508.1	MB	
	AROCLOR 1232	ND	ug/L	0.02		508.1	MB	
	AROCLOR 1242	ND	ug/L	0.02		508.1	MB	
	AROCLOR 1248	ND	ug/L	0.02		508.1	MB	
	AROCLOR 1254	ND	ug/L	0.02		508.1	MB	
	AROCLOR 1260	ND	ug/L	0.02		508.1	MB	
	AROCLOR 1016	ND	ug/L	0.02		508.1	MB	
	TETRACHLORO-M-XYLENE (SURR)	103	%	0.00		508.1	MB	
515_060110	2,4 - D	ND	ug/L	0.05		515.1	MB	
	2,4,5 - TP (SILVEX)	ND	ug/L	0.10		515.1	MB	
	PENTACHLOROPHENOL	ND	ug/L	0.02		515.1	MB	
	DALAPON	ND	ug/L	0.50		515.1	MB	
	DINOSEB	ND	ug/L	0.10		515.1	MB	
	PICLORAM	ND	ug/L	0.05		515.1	MB	
	DICAMBA	ND	ug/L	0.05		515.1	MB	
	2,4 DB	ND	ug/L	0.25		515.1	MB	
	2,4,5 T	ND	ug/L	0.10		515.1	MB	
	BENTAZON	ND	ug/L	0.12		515.1	MB	
	DICHLORPROP	ND	ug/L	0.12		515.1	MB	
	ACTIFLORFIN	ND	ug/L	0.50		515.1	MB	
	DACTHAL (DCPA)	ND	ug/L	0.02		515.1	MB	
	2,4 - DCAA (SURR)	94	%			515.1	MB	
525_060110	HEPTACHLOR EPOXIDE "B"	ND	ug/L	0.02		525.2	MB	
	ENDRIN	ND	ug/L	0.02		525.2	MB	
	LINDANE (BHC - GAMMA)	ND	ug/L	0.02		525.2	MB	
	METHOXYCHLOR	ND	ug/L	0.02		525.2	MB	
	ALACHLOR	ND	ug/L	0.02		525.2	MB	
	ATRAZINE	ND	ug/L	0.02		525.2	MB	
	BENZO(A)PYRENE	ND	ug/L	0.02		525.2	MB	
	CHLORDANE, TECHNICAL	ND	ug/L	0.02		525.2	MB	
	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.02		525.2	MB	
	DI(ETHYLHEXYL)-PHTHALATE	0.12	ug/L	0.60		525.2	MB	
	HEPTACHLOR	ND	ug/L	0.02		525.2	MB	
	HEXACHLOROBENZENE	ND	ug/L	0.02		525.2	MB	
	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.02		525.2	MB	
	SIMAZINE	ND	ug/L	0.02		525.2	MB	
	ALDRIN	ND	ug/L	0.05		525.2	MB	

*Notation:

LRB: Laboratory Reagent Blanks are used to determine the background level of the analytes in a laboratory batch. Therefore, this report may include analytes not requested for your submitted samples.

MB: Method Blanks are used to determine background levels of analytes in digested and extracted laboratory reagent water.

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QUALITY CONTROL REPORT
BLANK REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Batch	Analyte	Result	Units	Limit	QC Qualifier	Method	Type*	Comments
525_060110	BUTACHLOR	ND	ug/L	0.10		525.2	MB	
	DIELDRIN	ND	ug/L	0.05		525.2	MB	
	METOLACHLOR	ND	ug/L	0.25		525.2	MB	
	METRIBUZIN	ND	ug/L	0.05		525.2	MB	
	PROPACHLOR	ND	ug/L	0.05		525.2	MB	
	BROMACIL	ND	ug/L	0.05		525.2	MB	
	PROMETON	ND	ug/L	0.05		525.2	MB	
	TERBACIL	ND	ug/L	0.05		525.2	MB	
	DIAZINON	ND	ug/L	0.05		525.2	MB	
	EPTC	ND	ug/L	0.07		525.2	MB	
	4,4-DDD	ND	ug/L	0.05		525.2	MB	
	4,4-DDE	ND	ug/L	0.05		525.2	MB	
	4,4-DDT	ND	ug/L	0.05		525.2	MB	
	CYANAZINE	ND	ug/L	0.05		525.2	MB	
	MALATHION	ND	ug/L	0.05		525.2	MB	
	PARATHION	ND	ug/L	0.05		525.2	MB	
	TRIFLURALIN	ND	ug/L	0.05		525.2	MB	
	NAPTHALENE	ND	ug/L	0.02		525.2	MB	
	FLUORENE	ND	ug/L	0.05		525.2	MB	
	ACENAPHTHENE	ND	ug/L	0.05		525.2	MB	
	ANTHRACENE	ND	ug/L	0.05		525.2	MB	
	BENZ(A)ANTHRACENE	ND	ug/L	0.02		525.2	MB	
	BENZO(B)FLUORANTHENE	ND	ug/L	0.05		525.2	MB	
	BENZO(G,H,I)PERYLENE	ND	ug/L	0.05		525.2	MB	
	BENZO(K)FLUORANTHENE	ND	ug/L	0.05		525.2	MB	
	CHRYSENE	ND	ug/L	0.05		525.2	MB	
	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.05		525.2	MB	
	FLUORANTHENE	ND	ug/L	0.05		525.2	MB	
	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.05		525.2	MB	
	PHENANTHRENE	ND	ug/L	0.05		525.2	MB	
	PYRENE	ND	ug/L	0.05		525.2	MB	
	BENZYL BUTYL PHTHALATE	ND	ug/L	0.60		525.2	MB	
	DI-N-BUTYL PHTHALATE	0.17	ug/L	0.60		525.2	MB	
	DIETHYL PHTHALATE	ND	ug/L	0.60		525.2	MB	
	DIMETHYL PHTHALATE	ND	ug/L	0.60		525.2	MB	
	1,3-DIMETHYL-2-NITROBENZENE (Sur	84	%			525.2	MB	
	PERYLENE-D12 (Surr)	97	%			525.2	MB	
	PYRENE-D10 (Surr)	93	%			525.2	MB	
	TRIPHENYLPHOSPHATE (Surr)	99	%			525.2	MB	

*Notation:

LRB: Laboratory Reagent Blanks are used to determine the background level of the analytes in a laboratory batch. Therefore, this report may include analytes not requested for your submitted samples.

MB: Method Blanks are used to determine background levels of analytes in digested and extracted laboratory reagent water.

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QUALITY CONTROL REPORT
BLANK REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Batch	Analyte	Result	Units	Limit	QC Qualifier	Method	Type*	Comments
531_060111	OXYMAL	ND	ug/L	1.00		531.2	MB	
	CARBOFURAN	ND	ug/L	0.45		531.2	MB	
	ALDICARB SULFOXIDE	ND	ug/L	0.25		531.2	MB	
	ALDICARB SULFONE	ND	ug/L	0.40		531.2	MB	
	METHOMYL	ND	ug/L	0.25		531.2	MB	
	3-HYDROXYCARBOFURAN	ND	ug/L	0.50		531.2	MB	
	ALDICARB	ND	ug/L	0.25		531.2	MB	
	CARBARYL	ND	ug/L	0.50		531.2	MB	
	PROPOXUR (BAYGON)	ND	ug/L	0.25		531.2	MB	
	METHIOCARB	ND	ug/L	1.00		531.2	MB	

*Notation:

LRB: Laboratory Reagent Blanks are used to determine the background level of the analytes in a laboratory batch. Therefore, this report may include analytes not requested for your submitted samples.

MB: Method Blanks are used to determine background levels of analytes in digested and extracted laboratory reagent water.

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QUALITY CONTROL REPORT
QCS/LFB REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
508_060110	TETRACHLORO-M-XYLENE (SURR)	101		%	508.1		70-130		LFB	
515_060110	2,4 - D	2.13	2	ug/L	515.1	107	70-130		LFB	
	2,4,5 - TP (SILVEX)	1	1	ug/L	515.1	100	70-130		LFB	
	PENTACHLOROPHENOL	1.02	1	ug/L	515.1	102	70-130		LFB	
	DALAPON	10.4	13	ug/L	515.1	80	70-130		LFB	
	DINOSEB	1.18	2	ug/L	515.1	59	70-130		LFB	
	PICLORAM	0.96	1	ug/L	515.1	96	70-130		LFB	
	DICAMBA	1.07	1	ug/L	515.1	107	70-130		LFB	
	2,4 DB	7.74	8	ug/L	515.1	97	70-130		LFB	
	2,4,5 T	0.98	1	ug/L	515.1	98	70-130		LFB	
	BENTAZON	2.1	2	ug/L	515.1	105	70-130		LFB	
	DICHLORPROP	3.05	3	ug/L	515.1	102	70-130		LFB	
	ACTIFLORFIN	0.72	1	ug/L	515.1	72	70-130		LFB	
	DACTHAL (DCPA)	1.06	1	ug/L	515.1	106	70-130		LFB	
	2,4 - DCAA (SURR)	97		%	515.1	NA	78-130		LFB	
525_060110	HEPTACHLOR EPOXIDE "B"	0.76	1	ug/L	525.2	76	70-130		LFB	
	ENDRIN	0.91	1	ug/L	525.2	91	70-130		LFB	
	LINDANE (BHC - GAMMA)	0.89	1	ug/L	525.2	89	70-130		LFB	
	METHOXYCHLOR	1.03	1	ug/L	525.2	103	70-130		LFB	
	ALACHLOR	1.79	2	ug/L	525.2	90	70-130		LFB	
	ATRAZINE	1.9	2	ug/L	525.2	95	70-130		LFB	
	BENZO(A)PYRENE	0.88	1	ug/L	525.2	88	70-130		LFB	
	CHLORDANE, TECHNICAL	0.78	1	ug/L	525.2	78	70-130		LFB	
	DI(ETHYLHEXYL)-ADIPATE	0.8	1	ug/L	525.2	80	70-130		LFB	
	DI(ETHYLHEXYL)-PHTHALATE	0.92	1	ug/L	525.2	92	70-130		LFB	
	HEPTACHLOR	0.88	1	ug/L	525.2	88	70-130		LFB	
	HEXACHLOROBENZENE	0.8	1	ug/L	525.2	80	70-130		LFB	
	HEXACHLOROCYCLO-PENTADIENE	0.93	1	ug/L	525.2	93	70-130		LFB	
	SIMAZINE	0.85	1	ug/L	525.2	85	70-130		LFB	
	ALDRIN	0.7	1	ug/L	525.2	70	70-130		LFB	
	BUTACHLOR	0.86	1	ug/L	525.2	86	70-130		LFB	
	DIELDRIN	0.81	1	ug/L	525.2	81	70-130		LFB	
	METOLACHLOR	0.95	1	ug/L	525.2	95	70-130		LFB	
	METRIBUZIN	0.61	1	ug/L	525.2	61	70-130	LR	LFB	

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

FORM: cLFB

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11525 Knudson Rd
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

QUALITY CONTROL REPORT
QCS/LFB REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525_060110	PROPACHLOR	0.95	1	ug/L	525.2	95	70-130		LFB	
	BROMACIL	0.88	1	ug/L	525.2	88	70-130		LFB	
	PROMETON	0.43	1	ug/L	525.2	43	70-130	QA	LFB	
	TERBACIL	0.96	1	ug/L	525.2	96	70-130		LFB	
	DIAZINON	0.81	1	ug/L	525.2	81	70-130		LFB	
	EPTC	0.86	1	ug/L	525.2	86	70-130		LFB	
	4,4-DDD	0.74	1	ug/L	525.2	74	70-130		LFB	
	4,4-DDE	0.8	1	ug/L	525.2	80	70-130		LFB	
	4,4-DDT	0.85	1	ug/L	525.2	85	70-130		LFB	
	CYANAZINE	0.85	1	ug/L	525.2	85	70-130		LFB	
	MALATHION	0.7	1	ug/L	525.2	70	70-130		LFB	
	TRIFLURALIN	0.98	1	ug/L	525.2	98	70-130		LFB	
	FLUORENE	0.87	1	ug/L	525.2	87	70-130		LFB	
	ACENAPHTHYLENE	0.54	1	ug/L	525.2	54	70-130	LR	LFB	
	ANTHRACENE	0.75	1	ug/L	525.2	75	70-130		LFB	
	BENZ(A)ANTHRACENE	0.88	1	ug/L	525.2	88	70-130		LFB	
	BENZO(B)FLUORANTHENE	1.05	1	ug/L	525.2	105	70-130		LFB	
	BENZO(G,H,I)PERYLENE	1.22	1	ug/L	525.2	122	70-130		LFB	
	BENZO(K)FLUORANTHENE	0.88	1	ug/L	525.2	88	70-130		LFB	
	CHRYSENE	0.92	1	ug/L	525.2	92	70-130		LFB	
	DIBENZO(A,H)ANTHRACENE	1.07	1	ug/L	525.2	107	70-130		LFB	
	FLUORANTHENE	0.96	1	ug/L	525.2	96	70-130		LFB	
	INDENO(1,2,3-CD)PYRENE	1.09	1	ug/L	525.2	109	70-130		LFB	
	PHENANTHRENE	0.89	1	ug/L	525.2	89	70-130		LFB	
	BENZYL BUTYL PHTHALATE	0.94	1	ug/L	525.2	94	70-130		LFB	
	DI-N-BUTYL PHTHALATE	1	1	ug/L	525.2	100	70-130		LFB	
	DIETHYL PHTHALATE	1.19	1	ug/L	525.2	119	70-130		LFB	
	DIMETHYL PHTHALATE	0.81	1	ug/L	525.2	81	70-130		LFB	
	1,3-DIMETHYL-2-NITROBENZENE (Surr)	88		%	525.2	NA	70-130		LFB	
	PERYLENE-D12 (Surr)	105		%	525.2	NA	70-130		LFB	
	PYRENE-D10 (Surr)	98		%	525.2	NA	70-130		LFB	
	TRIPHENYLPHOSPHATE (Surr)	97		%	525.2	NA	70-130		LFB	
531_060111	OXYMAL	19.1	20	ug/L	531.2	96	70-130		LFB	
	CARBOFURAN	18.8	20	ug/L	531.2	94	70-130		LFB	
	ALDICARB SULFOXIDE	18.6	20	ug/L	531.2	93	70-130		LFB	

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

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FORM: cLFB

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11525 Knudson Rd
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

QUALITY CONTROL REPORT
QCS/LFB REPORT

Reference Number: 06-00222
Report Date: 01/18/06

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_060111	ALDICARB SULFONE	18.2	20	ug/L	531.2	91	70-130		LFB	
	METHOMYL	18.3	20	ug/L	531.2	92	70-130		LFB	
	3-HYDROXYCARBOFURAN	18.2	20	ug/L	531.2	91	70-130		LFB	
	ALDICARB	17.7	20	ug/L	531.2	89	70-130		LFB	
	CARBARYL	18.8	20	ug/L	531.2	94	70-130		LFB	
	PROPOXUR (BAYGON)	18.7	20	ug/L	531.2	94	70-130		LFB	
	METHIOCARB	18.1	20	ug/L	531.2	91	70-130		LFB	

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

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FORM: cLFB

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Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 06-00222
Report Date: 1/18/2006

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
515_060110									
	449	2,4 - DCAA (SURR)	119	109	%	**8.8**	0-45	DUP	
525_060110									
	265	FLUORENE	0.1	0.08	ug/L	**22.2**	0-45	DUP	
	265	PHENANTHRENE	0.26	0.18	ug/L	**36.4**	0-45	DUP	
	265	1,3-DIMETHYL-2-NITROBENZENE (Surr	89	86	%	**3.4**	0-45	DUP	
	265	PYRENE-D10 (Surr)	91	94	%	**3.2**	0-45	DUP	
	265	PERYLENE-D12 (Surr)	96	100	%	**4.1**	0-45	DUP	
	265	TRIPHENYLPHOSPHATE (Surr)	84	90	%	**6.9**	0-45	DUP	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
515_060110														
	450	2,4 - D	ND	2		2	ug/L	**100**	**NA**	65-135	**NA**	0-60	LFM	
	450	2,4,5 - TP (SILVEX)	ND	0.99		1	ug/L	**99**	**NA**	65-135	**NA**	0-60	LFM	
	450	PENTACHLOROPHENOL	ND	1.01		1	ug/L	**101**	**NA**	65-135	**NA**	0-60	LFM	
	450	DALAPON	ND	12		13	ug/L	**92**	**NA**	65-135	**NA**	0-60	LFM	
	450	DINOSEB	ND	1.81		2	ug/L	**91**	**NA**	65-135	**NA**	0-60	LFM	
	450	PICLORAM	ND	0.9		1	ug/L	**90**	**NA**	65-135	**NA**	0-60	LFM	
	450	DICAMBA	ND	1.01		1	ug/L	**101**	**NA**	65-135	**NA**	0-60	LFM	
	450	2,4 DB	ND	6.77		8	ug/L	**85**	**NA**	65-135	**NA**	0-60	LFM	
	450	2,4,5 T	ND	1		1	ug/L	**100**	**NA**	65-135	**NA**	0-60	LFM	
	450	BENTAZON	ND	2.07		2	ug/L	**104**	**NA**	65-135	**NA**	0-60	LFM	
	450	DICHLORPROP	ND	2.94		3	ug/L	**98**	**NA**	65-135	**NA**	0-60	LFM	
	450	ACTIFLORFIN	ND	0.97		1	ug/L	**97**	**NA**	65-135	**NA**	0-60	LFM	
	450	DACTHAL (DCPA)	ND	1.08		1	ug/L	**108**	**NA**	65-135	**NA**	0-60	LFM	
	450	2,4 - DCAA (SURR)	102	88			%		**NA**	70-130	**NA**	0-60	LFM	
525_060110														
	602	HEPTACHLOR EPOXIDE "B"	ND	0.78		1	ug/L	**78**	**NA**	70-130	**NA**	0-50	LFM	
	602	ENDRIN	ND	0.96		1	ug/L	**96**	**NA**	70-130	**NA**	0-60	LFM	
	602	LINDANE (BHC - GAMMA)	ND	0.86		1	ug/L	**86**	**NA**	70-130	**NA**	0-60	LFM	
	602	METHOXYCHLOR	ND	1.19		1	ug/L	**119**	**NA**	70-130	**NA**	0-60	LFM	
	602	ALACHLOR	ND	1.94		2	ug/L	**97**	**NA**	70-130	**NA**	0-60	LFM	
	602	ATRAZINE	ND	1.8		2	ug/L	**90**	**NA**	70-130	**NA**	0-60	LFM	
	602	BENZO(A)PYRENE	ND	0.91		1	ug/L	**91**	**NA**	70-130	**NA**	0-60	LFM	
	602	CHLORDANE, TECHNICAL	ND	0.84		1	ug/L	**84**	**NA**	70-130	**NA**	0-60	LFM	
	602	DI(ETHYLHEXYL)-ADIPATE	ND	0.88		1	ug/L	**88**	**NA**	70-130	**NA**	0-60	LFM	
	602	DI(ETHYLHEXYL)-PHTHALATE	ND	0.99		1	ug/L	**99**	**NA**	70-130	**NA**	0-60	LFM	
	602	HEPTACHLOR	ND	0.9		1	ug/L	**90**	**NA**	70-130	**NA**	0-60	LFM	
	602	HEXACHLOROBENZENE	ND	0.83		1	ug/L	**83**	**NA**	70-130	**NA**	0-60	LFM	
	602	HEXACHLOROCYCLO-PENTADIENE	ND	0.92		1	ug/L	**92**	**NA**	70-130	**NA**	0-60	LFM	
	602	SIMAZINE	ND	0.89		1	ug/L	**89**	**NA**	70-130	**NA**	0-60	LFM	
	602	ALDRIN	ND	0.73		1	ug/L	**73**	**NA**	70-130	**NA**	0-60	LFM	
	602	BUTACHLOR	ND	0.98		1	ug/L	**98**	**NA**	70-130	**NA**	0-60	LFM	
	602	DIELDRIN	ND	0.84		1	ug/L	**84**	**NA**	70-130	**NA**	0-60	LFM	
	602	METOLACHLOR	ND	0.99		1	ug/L	**99**	**NA**	70-130	**NA**	0-60	LFM	
	602	METRIBUZIN	ND	0.9		1	ug/L	**90**	**NA**	70-130	**NA**	0-60	LFM	
	602	PROPACHLOR	ND	0.97		1	ug/L	**97**	**NA**	70-130	**NA**	0-60	LFM	
	602	BROMACIL	ND	1.12		1	ug/L	**112**	**NA**	70-130	**NA**	0-60	LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier		Comments
	602	PROMETON	ND	0.3		1	ug/L	**30**	**NA**	70-130	**NA**	0-60	QA	LFM	
	602	TERBACIL	ND	1.12		1	ug/L	**112**	**NA**	70-130	**NA**	0-60		LFM	
	602	DIAZINON	ND	0.89		1	ug/L	**89**	**NA**	70-130	**NA**	0-60		LFM	
	602	EPTC	ND	0.87		1	ug/L	**87**	**NA**	70-130	**NA**	0-60		LFM	
	602	4,4-DDD	ND	0.75		1	ug/L	**75**	**NA**	70-130	**NA**	0-60		LFM	
	602	4,4-DDE	ND	0.79		1	ug/L	**79**	**NA**	70-130	**NA**	0-60		LFM	
	602	4,4-DDT	ND	0.8		1	ug/L	**80**	**NA**	70-130	**NA**	0-60		LFM	
	602	CYANAZINE	ND	0.75		1	ug/L	**75**	**NA**	70-130	**NA**	0-60		LFM	
	602	MALATHION	ND	0.78		1	ug/L	**78**	**NA**	70-130	**NA**	0-60		LFM	
	602	TRIFLURALIN	ND	1.03		1	ug/L	**103**	**NA**	70-130	**NA**	0-60		LFM	
	602	FLUORENE	ND	0.9		1	ug/L	**90**	**NA**	70-130	**NA**	0-60		LFM	
	602	ACENAPHTHYLENE	ND	0.35		1	ug/L	**35**	**NA**	70-130	**NA**	0-60	LR	LFM	
	602	ANTHRACENE	ND	0.86		1	ug/L	**86**	**NA**	70-130	**NA**	0-60		LFM	
	602	BENZ(A)ANTHRACENE	ND	1.03		1	ug/L	**103**	**NA**	70-130	**NA**	0-60		LFM	
	602	BENZO(B)FLUORANTHENE	ND	1.12		1	ug/L	**112**	**NA**	70-130	**NA**	0-60		LFM	
	602	BENZO(G,H,I)PERYLENE	ND	1.21		1	ug/L	**121**	**NA**	70-130	**NA**	0-60		LFM	
	602	BENZO(K)FLUORANTHENE	ND	0.85		1	ug/L	**85**	**NA**	70-130	**NA**	0-60		LFM	
	602	CHRYSENE	ND	1.06		1	ug/L	**106**	**NA**	70-130	**NA**	0-60		LFM	
	602	DIBENZO(A,H)ANTHRACENE	ND	1.04		1	ug/L	**104**	**NA**	70-130	**NA**	0-60		LFM	
	602	INDENO(1,2,3-CD)PYRENE	ND	1.13		1	ug/L	**113**	**NA**	70-130	**NA**	0-60		LFM	
	602	PHENANTHRENE	ND	0.93		1	ug/L	**93**	**NA**	70-130	**NA**	0-60		LFM	
	602	PYRENE	ND	0.91		1	ug/L	**91**	**NA**	70-130	**NA**	0-60		LFM	
	602	BENZYL BUTYL PHTHALATE	ND	0.98		1	ug/L	**98**	**NA**	70-130	**NA**	0-60		LFM	
	602	DI-N-BUTYL PHTHALATE	ND	1.05		1	ug/L	**105**	**NA**	70-130	**NA**	0-60		LFM	
	602	DIETHYL PHTHALATE	ND	1.09		1	ug/L	**109**	**NA**	70-130	**NA**	0-60		LFM	
	602	DIMETHYL PHTHALATE	ND	0.95		1	ug/L	**95**	**NA**	70-130	**NA**	0-60		LFM	
	602	1,3-DIMETHYL-2-NITROBENZENE (Surr	87	88			%		**NA**	70-130	**NA**	0-60		LFM	
	602	PYRENE-D10 (Surr)	91	95			%		**NA**	70-130	**NA**	0-60		LFM	
	602	PERYLENE-D12 (Surr)	96	103			%		**NA**	70-130	**NA**	0-60		LFM	
	602	TRIPHENYLPHOSPHATE (Surr)	93	98			%		**NA**	70-130	**NA**	0-60		LFM	
531_060111															
	450	OXYMAL	ND	20.2	19.4	20	ug/L	**101**	**97**	70-130	**4.0**	0-50		LFM	
	450	CARBOFURAN	ND	18.9	18.3	20	ug/L	**95**	**92**	70-130	**3.2**	0-50		LFM	
	450	ALDICARB SULFOXIDE	ND	19.7	18.9	20	ug/L	**99**	**95**	70-130	**4.1**	0-50		LFM	
	450	ALDICARB SULFONE	ND	20.2	19.4	20	ug/L	**101**	**97**	70-130	**4.0**	0-50		LFM	
	450	METHOMYL	ND	18.8	17.9	20	ug/L	**94**	**90**	70-130	**4.9**	0-50		LFM	
	450	3-HYDROXYCARBOFURAN	ND	19.7	18.9	20	ug/L	**99**	**95**	70-130	**4.1**	0-50		LFM	

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Reference Number: 06-00222
Report Date: 1/18/2006

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
	450	ALDICARB	ND	17.7	16.9	20	ug/L	**89**	**85**	70-130	**4.6**	0-50	LFM	
	450	CARBARYL	ND	18.1	17.3	20	ug/L	**91**	**87**	70-130	**4.5**	0-50	LFM	
	450	PROPOXUR (BAYGON)	ND	18.9	18.3	20	ug/L	**95**	**92**	70-130	**3.2**	0-50	LFM	
	450	METHIOCARB	ND	16.8	15.1	20	ug/L	**84**	**76**	70-130	**10.7**	0-50	LFM	

%RPD = Relative Percent Difference

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Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

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Qualifier Definitions

Reference Number: 06-00222
Report Date: 01/18/06

Qualifier	Definition
LR	Low recovery can not be accounted for. The continuing calibration checks are within acceptable limits.
QA	Acceptance Limits do not apply. This method is not the primary method for qualitative analysis.

Note: Some qualifier definitions found on this page may pertain to results or QC data which are not printed with this report.

FORM: QualifierDefs

Sample #1/2

Mill Creek Water Treatment Plant Laboratory

581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681

Date: 02/15/06

System ID / Name: **Walla Walla Basin Watershed Council**

Amount Due: $75.00 pd

Sampler Bob Bower

Invoice Number: 6001

Address: P.O. 68

Date Collected: 1/3/06

City: Milton Freewater

Date Analyzed: 1/3/06

State: OR Zip Code: 97862

Lab Analyst: Skifstad

Membrane Filtration / Fecal Coliform Analysis Report

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater 20th Edition

Test Method 9222D			
Sample ID #1	Results		Units
Intake #1-A	20.0		CFU's/100 mL

Sample ID #2	Results		Units
Intake #1-B	14.0		CFU's/100 mL

Sample ID #3	Results		Units
Well #1 OBS	2.5		CFU's/100 mL

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krebs 2-15-06 (date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

Sample #3

EDGE ANALYTICAL
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11525 Knudson Rd.
Burlington, WA 98233
(800) 755-9295
(360) 757-1400 - FAX (360) 757-1402

INVOICE

Client No: WAL06

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 S MAIN STREET
MILTON-FREEWATER, OR 97862

Attn: Dirk Dower

Please include this number with payment

Reference: **06-06951**
Date: June 27, 2006
Project: HBDIC Recharge
Date Received: June 02, 2006
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	14226.00	OBD#1	OBS#1	Chemical Oxygen Demand	$32.00
2	14226.00	OBD#1	OBS#1	Total Kjeldahl Nitrogen	$29.00
3	14226.00	OBD#1	OBS#1	Total Dissolved Solids	$17.00
4	14226.00	OBD#1	OBS#1	Chloride	$18.00
5	14226.00	OBD#1	OBS#1	SHIPPING CHARGE	$5.00
6	14227.00	OBD#1	Rejected for out of hold time	Nitrate-N	
7	14227.00	OBD#1	Rejected for out of hold time	ortho-phosphate	

Grand Total:	$101.00
Amount Paid:	$0.00
Amount Due:	$101.00

APPROVED TO PAY

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-07860

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 6/28/2006
Date Analyzed: 6/27/2006
Extraction Date: 531_060627
Analyst: CO
Supervisor:
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.83		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	1.0		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.88		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.76		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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DATA REPORT

Reference Number: 06-07860

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 6/28/2006
Date Analyzed: 6/27/2006
Extraction Date: 508_060622
Analyst: JS
Supervisor: Pm
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	ND	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	ND	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	ND	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	ND	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	ND	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	ND	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	ND	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	ND	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	ND	ug/L	1	0.5	3	

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
218-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.

MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.

PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.

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J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-07860

Project: WBWC
Fact ID: 45210

Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 246074
Report Date: 6/28/2006
Date Analyzed: 6/22/2006
Extraction Date: 525_060622
Analyst: JS
Supervisor:
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2	ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		
3-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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HERBICIDES IN DRINKING WATER

Reference Number: 06-07860

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 7/6/2006
Date Analyzed: 7/5/2006
Extraction Date: 515_060626
Analyst: JS
Supervisor: PM
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	ND	ug/L	0.2	0.11	70	
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L	0.1	0.02	50	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.1	0.044	1	
75-99-0	DALAPON	ND	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	ND	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	ND	ug/L	0.1	0.089	500	
	EPA Unregulated						
1918-00-9	DICAMBA	ND	ug/L	0.1	0.045		
	State Unregulated						
1861-32-1	TOTAL DCPA	ND	ug/L	0.1	0.089		
E-14-02-8	DCPA (ACID METABOLITES)	ND	ug/L	0.1	0.1		
94-82-6	2,4 DB	ND	ug/L	0.8	0.10		
93-76-5	2,4,5 T	ND	ug/L	0.1	0.044		
25057-89-0	BENTAZON	ND	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	ND	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	ND	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	ND	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.1	0.044		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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INVOICE

Client No: WAL06

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 S MAIN STREET
MILTON-FREEWATER, OR 97862

Attn: Bob Bower

Please include this number with payment

Reference: **06-07860**
Date: July 7, 2006
Project: HBDIC
Date Received: June 22, 2006
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	16174.00	HBDIC	OBS#1	Synthetic Organics	$590.00
2	16174.00	HBDIC	OBS#1	Chlorophenoxy Herbicides	
3	16174.00	HBDIC	OBS#1	Carbamates	

Grand Total:	$590.00
Amount Paid:	$0.00
Amount Due:	$590.00

APPROVED TO PAY

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Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 6/26/2006
Reference Number: 06-06951
Project: HBDIC Recharge

Collected By:

Date Received: 6/2/2006
Supervisor:

Lab Number: 14226 Sample Description: OBD#1 - OBS#1 Sample Date: 5/30/2006

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
16887-00-6	**CHLORIDE**	**0.53**	20	0.012	mg/L	1.0	300.0	6/2/2006	MVP	I060602A	
E-10173	**TOTAL DISSOLVED SOLIDS**	**76**	10	10	mg/L	1.0	SM2540 C	6/7/2006	SO	TDS_060607	
E-10264	**TOTAL KJELDAHL NITROGEN**	**ND**	0.50		mg/L	1.0	SM4500-Norg C	6/21/2006	SO	TKN-060621	
E-10117	**CHEMICAL OXYGEN DEMAND**	**ND**	8.0		mg/L	1.0	SM5220 D	6/9/2006	SO	COD_060609	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL)
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

FORM: RESULT

Sample #3

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QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 06-07860
Report Date: 07/06/06

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
508_060622						
16174	TETRACHLORO-M-XYLENE (SURR)	92		%	508.1	Acceptance Range is 42% to 137%
515_060626						
16174	2,4 - DCAA (SURR)	105		%	515.1	Acceptance Range is 60% to 140%
525_060622						
16174	1,3-DIMETHYL-2-NITROBENZENE (Surr)	95		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	97		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	91		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	99		%		Acceptance Range is 70% to 130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-07860

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 6/28/2006
Date Analyzed: 6/27/2006
Extraction Date: 531_060627
Analyst: CO
Supervisor:
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.83		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	1.0		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.88		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.76		

n amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
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DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-07860

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 6/28/2006
Date Analyzed: 6/27/2006
Extraction Date: 508_060622
Analyst: JS
Supervisor:
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	ND	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	ND	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	ND	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	ND	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	ND	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	ND	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	ND	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	ND	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	ND	ug/L	1	0.5	3	

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
218-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.

MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.

PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.

MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-07860

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 6/28/2006
Date Analyzed: 6/22/2006
Extraction Date: 525_060622
Analyst: JS
Supervisor: [signature]
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2	ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.

MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds. A blank MCL or SAL value indicates a level is not currently established.

PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.

MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J - Estimated value.

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-07860

Project: HBDIC
Field ID: HBDIC
Sample Description: OBS#1
Sampled By: Bower
Sample Date: 6/12/2006
Source Type:
Sampler Phone: 509-520-3534

Lab Number: 04616174
Report Date: 7/6/2006
Date Analyzed: 7/5/2006
Extraction Date: 515_060626
Analyst: JS
Supervisor: PM
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	ND	ug/L	0.2	0.11	70	
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L	0.1	0.02	50	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.1	0.044	1	
75-99-0	DALAPON	ND	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	ND	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	ND	ug/L	0.1	0.089	500	
	EPA Unregulated						
1918-00-9	DICAMBA	ND	ug/L	0.1	0.045		
	State Unregulated						
1861-32-1	TOTAL DCPA	ND	ug/L	0.1	0.089		
E-14-02-8	DCPA (ACID METABOLITES)	ND	ug/L	0.1	0.1		
94-82-6	2,4 DB	ND	ug/L	0.8	0.10		
93-76-5	2,4,5 T	ND	ug/L	0.1	0.044		
25057-89-0	BENTAZON	ND	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	ND	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	ND	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	ND	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.1	0.044		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 6/26/2006
Reference Number: 06-06951
Project: HBDIC Recharge

Collected By:

Date Received: 6/2/2006
Supervisor:

Lab Number: 14226 Sample Description: OBD#1 - OBS#1 Sample Date: 5/30/2006

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
16887-00-6	**CHLORIDE**	**0.53**	20	0.012	mg/L	1.0	300.0	6/2/2006	MVP	I060602A	
E-10173	**TOTAL DISSOLVED SOLIDS**	**76**	10	10	mg/L	1.0	SM2540 C	6/7/2006	SO	TDS_060607	
E-10264	**TOTAL KJELDAHL NITROGEN**	**ND**	0.50		mg/L	1.0	SM4500-Norg C	6/21/2006	SO	TKN-060621	
E-10117	**CHEMICAL OXYGEN DEMAND**	**ND**	8.0		mg/L	1.0	SM5220 D	6/9/2006	SO	COD_060609	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL)
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

FORM: RESULT

Sample # 3

Mill Creek Water Treatment Plant Laboratory

581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1876
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681

Date: 06/05/06

System ID / Name: **Walla Walla Basin Watershed Council**

Amount Due: $50.00

Sampler Bob Bower

Invoice Number: 6002

Address: P.O. 68

Date Collected: 5/30/06

City: Milton Freewater

Date Analyzed: 5/30/06

State: OR Zip Code: 97862

Lab Analyst: Skifstad

Membrane Filtration / Fecal Coliform Analysis Report

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater 20th Edition

Test Method 9222D			
Sample ID #1	**Results**		**Units**
Well #1 OBS	0.0		CFU's/100 mL

Sample ID #2	**Results**		**Units**
Well #1 OBS-Dupl.	0.5		CFU's/100 mL

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krebs 6-5-06
(date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY

If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH DAY YEAR)	TIME COLLECTED	COUNTY NAME
5 / 30 / 06	3 : 03 ☐ AM ☒ PM	Umatilla

TYPE OF SYSTEM
☐ PUBLIC
☒ INDIVIDUAL (serves only 1 residence)

IF PUBLIC SYSTEM, COMPLETE: I.D. No. [ ][ ][ ][ ][ ][ ] CIRCLE GROUP A B

NAME OF SYSTEM: Walla Walla Basin Watershed Council

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: OBS #1 Duplicate

TELEPHONE NO. DAY ( ) EVENING ( )

SAMPLE COLLECTED BY: (Name): Bob Bower

SYSTEM OWNER/MGR.: (Name)

SOURCE TYPE ☐ GROUND WATER UNDER SURFACE INFLUENCE
☐ SURFACE ☒ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

WASHINGTON

TYPE OF SAMPLE (check only one in this column)

☐ ROUTINE DRINKING WATER check treatment
☐ Chlorinated (Residual: ____ Total ____ Free)
☐ Filtered
☐ Untreated or Other ____

☐ REPEAT SAMPLE Previous coliform presence Lab # ____ Date ____/____/____

☐ RAW SOURCE WATER Source # S [ ][ ]
☐ NEW CONSTRUCTION or REPAIRS
☒ OTHER (Specify) Membrane Filtration

☐ Total Coliform
☒ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☐ UNSATISFACTORY, Coliforms present

REPEAT SAMPLES REQUIRED: ☐ E. Coli present ☐ E. Coli absent ☐ Fecal present ☐ Fecal absent

☐ SATISFACTORY Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ____ /100 ml ____ E. COLI /100ml
FECAL COLIFORM 0.5 /100 ml ____ PLATE COUNT /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
☐ Sample too old
☐ Wrong container
☐ Incomplete form
☐ ____

TEST UNSUITABLE BECAUSE:
☐ Confluent growth
☐ TNTC
☐ Turbid culture
☐ Excess debris

SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

LAB NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
143- 03180	5/30/06 339pm	TK

DATE REPORTED

LABORATORY:
City Of Walla Walla
Water Treatment Plant
581 Mill Creek Road
Walla Walla, WA 99362

WATER SUPPLIER COPY

WATER BACTERIOLOGICAL ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDENROD COPY

If instructions are not followed, sample will be rejected.

DATE COLLECTED (MONTH DAY YEAR)	TIME COLLECTED	COUNTY NAME
5 / 30 / 06	3 : 00 ☐ AM ☒ PM	Umatilla

TYPE OF SYSTEM: ☐ PUBLIC ☒ INDIVIDUAL (serves only 1 residence)

IF PUBLIC SYSTEM, COMPLETE: I.D. No. [ ][ ][ ][ ][ ][ ] CIRCLE GROUP A B

NAME OF SYSTEM: Walla Walla Basin Watershed Council

SPECIFIC LOCATION WHERE SAMPLE COLLECTED: OBS #1

TELEPHONE NO. DAY ( ) EVENING ( )

SAMPLE COLLECTED BY: (Name) Bob Bower

SYSTEM OWNER/MGR.: (Name)

SOURCE TYPE ☐ GROUND WATER UNDER SURFACE INFLUENCE
☐ SURFACE ☒ WELL or WELL FIELD ☐ SPRING ☐ PURCHASED or INTERTIE ☐ COMBINATION or OTHER

SEND REPORT TO: (Print Full Name, Address and Zip Code)

WASHINGTON

TYPE OF SAMPLE (check only one in this column)

☐ ROUTINE DRINKING WATER check treatment
☐ Chlorinated (Residual: ____ Total ____ Free)
☐ Filtered
☐ Untreated or Other ____

☐ REPEAT SAMPLE Previous coliform presence Lab # ____ Date ____/____/____

☐ RAW SOURCE WATER Source # S [ ][ ]
☐ NEW CONSTRUCTION or REPAIRS
☒ OTHER (Specify) Membrane Filtration

☐ Total Coliform
☒ Fecal Coliform

REMARKS:

(LAB USE ONLY) DRINKING WATER RESULTS

☐ UNSATISFACTORY, Coliforms present
REPEAT SAMPLES REQUIRED: ☐ E. Coli present ☐ E. Coli absent ☐ Fecal present ☐ Fecal absent

☐ SATISFACTORY Coliforms absent

OTHER LABORATORY RESULTS

TOTAL COLIFORM ____ /100 ml ____ E. COLI /100ml
FECAL COLIFORM 0.0 /100 ml ____ PLATE COUNT /ml

ANOTHER SAMPLE REQUIRED

SAMPLE NOT TESTED BECAUSE:
☐ Sample too old
☐ Wrong container
☐ Incomplete form
☐ ____

TEST UNSUITABLE BECAUSE:
☐ Confluent growth
☐ TNTC
☐ Turbid culture
☐ Excess debris

SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

LAB NO. (7 DIGITS)	DATE, TIME RECEIVED	RECEIVED BY
143- 03179	5/30/06 3:39 PM	TK

DATE REPORTED

LABORATORY:
City Of Walla Walla
Water Treatment Plant
581 Mill Creek Road
Walla Walla, WA 99362

WATER SUPPLIER COPY

Appendices I-D

HBDIC Recharge Water Quality Testing:

Lab Results, Notes and Records

2006-2007 Recharge Season

Mill Creek
Water Treatment Plant
Laboratory
581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681

Date: 11/30/06

System ID / Name: **Walla Walla Basin Watershed Council**

Amount Due: $100.00

Sampler Bob Bower

Invoice Number: 6005

Address: P.O. Box 68

Date Collected: 11/29/06

City: Milton-Freewater

Date Analyzed: 11/29/06

State: Oregon Zip Code: 97862

Lab Analyst: Skifstad

Membrane Filtration / Fecal Coliform Analysis Report

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater 20th Edition

Test Method 9222D			
Sample ID #1	**Results**		**Units**
Intake -A	7.0		CFU's/100mL
Sample ID #2	**Results**		**Units**
Intake -B	12.0		CFU's/100mL
Sample ID #1	**Results**		**Units**
OBS #1-A	0.0		CFU's/100mL
Sample ID #1	**Results**		**Units**
OBS #1-B	3.0		CFU's/100mL

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krebs 11-30-06
(date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

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Microbiology | 360.671.0688 • 360.671.1577fax

Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 12/20/2006
Reference Number: 06-15463
Project: WWBWC

Collected By:

Date Received: 11/29/2006
Supervisor:

Lab Number: 33112 Sample Description: Intake Sample Date: 11/28/2006

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	NITRATE-N	0.33	0.02	0.015	mg/L	1.0	SM4500-NO3 F	12/6/2006	SO	NO3NO2-061206	
E-10264	TOTAL KJELDAHL NITROGEN	ND	0.5	0.5	mg/L	1.0	SM4500-Norg C	12/12/2006	SO	TKN-061211A	
7723-14-0	TOTAL PHOSPHORUS	ND	0.10	0.010	mg/L	1.0	SM4500-P F	12/4/2006	SO	TPHOS-061204	
E-10117	CHEMICAL OXYGEN DEMAND	ND	8.0	1.00	mg/L	1.0	SM5220 D	12/4/2006	SO	COD_061204	
16887-00-6	CHLORIDE	0.8	20	0.012	mg/L	1.0	300.0	11/29/2006	MVP	I061129A	
E-10173	TOTAL DISSOLVED SOLIDS	69	10	10	mg/L	1.0	SM2540 C	12/6/2006	SO	TDS_061206	

Lab Number: 33113 Sample Description: OBS #1 Sample Date: 11/28/2006

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	NITRATE-N	0.33	0.02	0.015	mg/L	1.0	SM4500-NO3 F	12/6/2006	SO	NO3NO2-061206	
E-10264	TOTAL KJELDAHL NITROGEN	ND	0.5	0.5	mg/L	1.0	SM4500-Norg C	12/12/2006	SO	TKN-061211A	
7723-14-0	TOTAL PHOSPHORUS	0.37	0.10	0.010	mg/L	1.0	SM4500-P F	12/4/2006	SO	TPHOS-061204	
E-10117	CHEMICAL OXYGEN DEMAND	ND	8.0	1.00	mg/L	1.0	SM5220 D	12/4/2006	SO	COD_061204	
16887-00-6	CHLORIDE	0.8	20	0.012	mg/L	1.0	300.0	11/29/2006	MVP	I061129A	
E-10173	TOTAL DISSOLVED SOLIDS	84	10	10	mg/L	1.0	SM2540 C	12/6/2006	SO	TDS_061206	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL)
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

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Microbiology | 360.671.0688 • 360.671.1577fax

HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: Intake
Sample Description: Intake
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 04633112
Report Date: 12/29/2006
Date Analyzed: 12/15/2006
Extraction Date: 515_061211
Analyst: TM
Supervisor: PM
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	ND	ug/L		0.16	70	
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L		0.04	50	
87-86-5	PENTACHLOROPHENOL	ND	ug/L		0.04	1	
75-99-0	DALAPON	ND	ug/L		0.76	200	
88-85-7	DINOSEB	ND	ug/L		0.11	7	
1918-02-1	PICLORAM	ND	ug/L		0.09	500	
	EPA Unregulated						
1918-00-9	DICAMBA	ND	ug/L		0.09		
	State Unregulated						
1861-32-1	TOTAL DCPA	ND	ug/L		0.09		
E-14-02-8	DCPA (ACID METABOLITES)	ND	ug/L	0.1	0.1		
94-82-6	2,4 DB	ND	ug/L		0.11		
93-76-5	2,4,5 T	ND	ug/L		0.07		
25057-89-0	BENTAZON	ND	ug/L		0.13		
120-36-5	DICHLORPROP	ND	ug/L		0.11		
50594-66-6	ACIFLUORFEN	ND	ug/L		0.16		
133-90-4	CHLORAMBEN	ND	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L		0.04		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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Microbiology | 360.671.0688 • 360.671.1577fax

HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: OBS #1
Sample Description: OBS #1
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 04633113
Report Date: 12/29/2006
Date Analyzed: 12/15/2006
Extraction Date: 515_061211
Analyst: TM
Supervisor: [signature]
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	**ND**	ug/L		0.16	70	
93-72-1	2,4,5 - TP (SILVEX)	**ND**	ug/L		0.04	50	
87-86-5	PENTACHLOROPHENOL	**ND**	ug/L		0.04	1	
75-99-0	DALAPON	**ND**	ug/L		0.76	200	
88-85-7	DINOSEB	**ND**	ug/L		0.11	7	
1918-02-1	PICLORAM	**ND**	ug/L		0.09	500	
	EPA Unregulated						
1918-00-9	DICAMBA	**ND**	ug/L		0.09		
	State Unregulated						
1861-32-1	TOTAL DCPA	**ND**	ug/L		0.09		
E-14-02-8	DCPA (ACID METABOLITES)	**ND**	ug/L	0.1	0.1		
94-82-6	2,4 DB	**ND**	ug/L		0.11		
93-76-5	2,4,5 T	**ND**	ug/L		0.07		
25057-89-0	BENTAZON	**ND**	ug/L		0.13		
120-36-5	DICHLORPROP	**ND**	ug/L		0.11		
50594-66-6	ACIFLUORFEN	**ND**	ug/L		0.16		
133-90-4	CHLORAMBEN	**ND**	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L		0.04		

A... ...nt of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: Intake
Sample Description: Intake
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 04633112
Report Date: 12/27/2006
Date Analyzed: 12/11/2006
Extraction Date: 525_061211
Analyst: CO
Supervisor:
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2	ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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J - Estimated value.

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
218-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: OBS #1
Sample Description: OBS #1
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 04633113
Report Date: 12/27/2006
Date Analyzed: 12/11/2006
Extraction Date: 525_061211
Analyst: MM/CC
Supervisor:
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
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117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
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206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
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DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: Intake
Sample Description: Intake
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 04633112
Report Date: 12/27/2006
Date Analyzed: 12/11/2006
Extraction Date: 508_061211
Analyst: MM
Supervisor:
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	**ND**	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	**ND**	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	**ND**	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	**ND**	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	**ND**	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	**ND**	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	**ND**	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	**ND**	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	**ND**	ug/L	1	0.5	3	

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J - Estimated value.

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DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: OBS #1
Sample Description: OBS #1
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 33113
Report Date: 12/27/2006
Date Analyzed: 12/11/2006
Extraction Date: 508_061211
Analyst: MM
Supervisor:
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	**ND**	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	**ND**	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	**ND**	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	**ND**	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	**ND**	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	**ND**	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	**ND**	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	**ND**	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	**ND**	ug/L	1	0.5	3	

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: Intake
Sample Description: Intake
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 33112
Report Date: 12/29/2006
Date Analyzed: 12/26/2006
Extraction Date: 531_061221
Analyst: TM/co
Supervisor:
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.83		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	1.0		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.88		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.76		

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-15463

Project: WWBWC
Field ID: OBS #1
Sample Description: OBS #1
Sampled By:
Sample Date: 11/28/2006
Source Type:
Sampler Phone:

Lab Number: 33113
Report Date: 12/29/2006
Date Analyzed: 12/26/2006
Extraction Date: 531_061221
Analyst: TM/co
Supervisor:
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.83		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	1.0		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.88		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.76		

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QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 06-15463
Report Date: 12/29/06

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
515_061211						
33112	2,4 - DCAA (SURR)	97		%	515.1	Acceptance Range is 60% to 140%
508_061211						
33112	TETRACHLORO-M-XYLENE (SURR)	92		%	508.1	Acceptance Range is 42% to 137%
525_061211						
33112	1,3-DIMETHYL-2-NITROBENZENE (Surr)	105		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	100		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	101		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	109		%		Acceptance Range is 70% to 130%
515_061211						
33113	2,4 - DCAA (SURR)	96		%	515.1	Acceptance Range is 60% to 140%
508_061211						
33113	TETRACHLORO-M-XYLENE (SURR)	91		%	508.1	Acceptance Range is 42% to 137%
525_061211						
33113	1,3-DIMETHYL-2-NITROBENZENE (Surr)	105		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	102		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	103		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	108		%		Acceptance Range is 70% to 130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 06-15463
Report Date: 12/27/06

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
515_061211						
33112	2,4 - DCAA (SURR)	97		%	515.1	Acceptance Range is 60% to 140%
508_061211						
33112	TETRACHLORO-M-XYLENE (SURR)	92		%	508.1	Acceptance Range is 42% to 137%
525_061211						
33112	1,3-DIMETHYL-2-NITROBENZENE (Surr)	105		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	100		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	101		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	109		%		Acceptance Range is 70% to 130%
515_061211						
33113	2,4 - DCAA (SURR)	96		%	515.1	Acceptance Range is 60% to 140%
508_061211						
33113	TETRACHLORO-M-XYLENE (SURR)	91		%	508.1	Acceptance Range is 42% to 137%
525_061211						
33113	1,3-DIMETHYL-2-NITROBENZENE (Surr)	105		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	102		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	103		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	108		%		Acceptance Range is 70% to 130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

Mill Creek
Water Treatment Plant
Laboratory
581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681

Date: 05/18/07

System ID / Name: **Walla Walla Basin Watershed Council**

Sampler Bob Bower

Address: P.O. Box 68

City: Milton-Freewater

State: Oregon Zip Code: 97862

Amount Due: $100.00

Invoice Number: 7001

Date Collected: 5/18/07

Date Analyzed: 5/18/07

Lab Analyst: Skifstad

Membrane Filtration / Fecal Coliform Analysis Report

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater 20th Edition

Test Method 9222D			
Sample ID #1	**Results**		**Units**
Intake -1A	19.0		CFU's/100mL
Sample ID #2	**Results**		**Units**
Intake -1B	23.0		CFU's/100mL
Sample ID #1	**Results**		**Units**
OBS - 2A	1.0		CFU's/100mL
Sample ID #1	**Results**		**Units**
OBS - 2B	0.0		CFU's/100mL

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krebs 5/21/07
(date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

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Bellingham WA — Microbiology | 805 Orchard Dr Suite 4 - 98225 | 360.671.0688 • 360.671.1577fax

Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 5/31/2007
Reference Number: 07-06211
Project: HBDIC Recharge Project

Collected By: Bob Bower

Date Received: 5/18/2007
Supervisor: JW

Lab Number: 14513 Sample Description: OBS #1 - Observation Well #1 Sample Date: 5/17/2007

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	**NITRATE-N**	**0.11**	0.100	0.015	mg/L	1.0	300.0	5/18/2007	MVP	I070518A	
E-10264	**TOTAL KJELDAHL NITROGEN**	**ND**	0.5	0.1391	mg/L	1.0	SM4500-Norg C	5/29/2007	SO	TKN-070529	
E-10117	**CHEMICAL OXYGEN DEMAND**	**ND**	8.0	1.00	mg/L	1.0	SM5220 D	5/21/2007	KJY	COD_070521	
16887-00-6	**CHLORIDE**	**0.5**	20	0.012	mg/L	1.0	300.0	5/18/2007	MVP	I070518A	
E-10173	**TOTAL DISSOLVED SOLIDS**	**69**	10	10	mg/L	1.0	SM2540 C	5/24/2007	SO	TDS_070524	
7723-14-0	**TOTAL PHOSPHORUS**	**ND**	0.10	0.0282	mg/L	1.0	SM4500-P F/SM 4500-P B	5/24/2007	SO	TPHOS-070524	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL)
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

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INVOICE

Client No: WAL06

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 S MAIN STREET
MILTON-FREEWATER, OR 97862

Attn:

Please include this number with payment

Reference: **07-06211**
Date: May 31, 2007
Project: HBDIC Recharge Project
Date Received: May 18, 2007
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	14513.00	OBS #1	Observation Well #1	Synthetic Organics	$590.00
2	14513.00	OBS #1	Observation Well #1	Chlorophenoxy Herbicides	
3	14513.00	OBS #1	Observation Well #1	Carbamates	
4	14513.00	OBS #1	Observation Well #1	Total Kjeldahl Nitrogen	$29.00
5	14513.00	OBS #1	Observation Well #1	Chemical Oxygen Demand	$32.00
6	14513.00	OBS #1	Observation Well #1	Nitrate-N	$18.00
7	14513.10	OBS #1	Observation Well #1	Total Phosphorus	$20.00
8	14513.10	OBS #1	Observation Well #1	Total Dissolved Solids	$17.00
9	14513.10	OBS #1	Observation Well #1	Chloride	$18.00
10	14513.10		Shipping Charge	SHIPPING CHARGE	$5.00

Grand Total:	$729.00
Amount Paid:	$0.00
Amount Due:	$729.00

APPROVED TO PAY

CHARGE TO 209-3103

Thank You for Your Business

Please pay by June 30, 2007 to avoid a 1.5% per month finance charge.

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-06211
Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: Observation Well #1
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: OBS #1
Lab Number: 04614513
Date Collected: 5/17/2007
Date Extracted: 515_07521
Date Analyzed: 5/21/2007
Report Date: 5/25/2007
Analyst: HY/CC
Supervisor:

EPA Method 515.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	EPA Regulated						
37	2,4 - D	**ND**	ug/L	0.2	0.2	70	
38	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.4	0.4	50	
134	PENTACHLOROPHENOL	**ND**	ug/L	0.08	0.08	1	
137	DALAPON	**ND**	ug/L	2	2	200	
139	DINOSEB	**ND**	ug/L	0.4	0.4	7	
140	PICLORAM	**ND**	ug/L	0.2	0.2	500	
	EPA Unregulated						
138	DICAMBA	**ND**	ug/L	0.2	0.2		
	State Unregulated						
222	TOTAL (DCPA & Metabolites)	**ND**	ug/L	0.1	0.1		
225	DCPA (ACID METABOLITES)	**ND**	ug/L	0.1	0.1		
135	2,4 DB	**ND**	ug/L	1.0	1.0		
136	2,4,5 T	**ND**	ug/L	0.4	0.4		
220	BENTAZON	**ND**	ug/L	0.5	0.5		
221	DICHLORPROP	**ND**	ug/L	0.5	0.5		
223	ACIFLUORFEN	**ND**	ug/L	2.0	2.0		
224	CHLORAMBEN	**ND**	ug/L	0.2	0.2		
226	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.5	0.5		

*- An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
**- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
****- Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-06211

Project: HBDIC Recharge Project

System Name:
System ID Number:
DOH Source Number:
Multiple Sources:
Sample Type:
Sample Purpose: Investigative or Other
Sample Location: Observation Well #1
County:
Sampled By: Bob Bower
Sampler Phone:

Field ID: OBS #1
Lab Number: 04614513
Date Collected: 5/17/2007
Date Extracted: 508_070523
Date Analyzed: 5/23/2007
Report Date: 5/25/2007
Analyst: MM/C(
Supervisor:

EPA Method 508.1 For State Drinking Water Compliance

DOH#	COMPOUNDS	RESULTS	Units	SRL	Trigger	MCL	COMMENT
	PCBs/Toxaphene						
153	PCBS (Total Aroclors)	**ND**	ug/L	0.2	0.2	0.5	
173	AROCLOR 1221	**ND**	ug/L	20	20		
174	AROCLOR 1232	**ND**	ug/L	0.5	0.5		
175	AROCLOR 1242	**ND**	ug/L	0.5	0.3		
176	AROCLOR 1248	**ND**	ug/L	0.1	0.1		
177	AROCLOR 1254	**ND**	ug/L	0.1	0.1		
178	AROCLOR 1260	**ND**	ug/L	0.2	0.2		
180	AROCLOR 1016	**ND**	ug/L	0.1	0.1		
36	TOXAPHENE	**ND**	ug/L	2	2	3	

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***- If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
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J - Estimated value.

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-06211

Project: HBDIC Recharge Project
Field ID: OBS #1
Sample Description: Observation Well #1
Sampled By: Bob Bower
Sample Date: 5/17/2007
Source Type:
Sampler Phone:

Lab Number: 04614513
Report Date: 5/31/2007
Date Analyzed: 5/29/2007
Extraction Date: 531_070529
Analyst: CO
Supervisor:
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	ND	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	ND	ug/L	1.0	0.87	40	
	EPA Unregulated						
46-87-3	ALDICARB SULFOXIDE	ND	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	ND	ug/L	1.0	0.83		
16752-77-5	METHOMYL	ND	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	ND	ug/L	1.0	1.0		
116-06-3	ALDICARB	ND	ug/L	1.0	0.88		
63-25-2	CARBARYL	ND	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	ND	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	ND	ug/L	1.0	0.76		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-06211

Project: HBDIC Recharge Project
Field ID: OBS #1
Sample Description: Observation Well #1
Sampled By: Bob Bower
Sample Date: 5/17/2007
Source Type:
Sampler Phone:

Lab Number: 04614513
Report Date: 5/30/2007
Date Analyzed: 5/23/2007
Extraction Date: 525_070523
Analyst: MM/CC
Supervisor:
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2	ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.
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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
[illegible]-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

An amount of "ND" indicates that the compound was not detected above the Lab's Method Detection Limit - MDL.

MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.

MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J - Estimated value.

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 07-06211
Report Date: 05/31/07

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
508_070523						
14513	TETRACHLORO-M-XYLENE (SURR)	93		%	508.1	Acceptance Limits 70%-130%
515_07521						
14513	2,4 - DCAA (SURR)	100		%	515.1	Acceptance Range is 70 - 130%
525_070523						
14513	1,3-DIMETHYL-2-NITROBENZENE (Surr)	96		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	106		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	77		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	97		%		Acceptance Range is 70% to 130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

Appendices I-E

HBDIC Recharge Water Quality Testing:

Lab Results, Notes and Records

2007-2008 Recharge Season

EDGE ANALYTICAL LABORATORIES

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WSDOE Lab C1251

DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764
Project: HBDIC Recharge Project

Lab Number: 35783
Field ID: Intake
Sample Description: @HBDIC Recharge
Matrix: Water
Collect Date: 11/26/2007
Extraction Date: 12/7/2007
Extraction Method: 3535

Report Date: 5/2/2008
Date Analyzed: 12/10/2007
Analyst: CO
Peer Review: MVA
Analytical Method: 525.2

SOC for Walla Walla

CAS ID#	COMPOUNDS	RESULT	Flag	Units	PQL	MDL	D.F.	Batch	COMMENT
2312-35-8	PROPARGITE	ND		ug/L		-	1.0	525_070120	Qualitative analysis
60-51-5	DIMETHOATE	ND		ug/L	0.5	0.03	1.0	525_070120	Qualitative analysis
57837-19-1	METALAXYL	ND		ug/L	0.1	-	1.0		Qualitative analysis
15299-99-7	NAPROPAMIDE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis
86-86-2	1-NAPHTHALENEACETAMIDE	ND		ug/L	0.5	-	1.0		Qualitative analysis
60168-88-9	FENARIMOL	ND		ug/L	0.1	0.03	1.0		Qualitative analysis
[illegible]6-34-7	MEVINPHOS	ND		ug/l	0.1	0.03	1.0		Qualitative analysis
[illegible]-50-0	AZINPHOS-METHYL	ND		ug/L	0.5	0.12	1.0		Qualitative analysis
2921-88-2	CHLORPYRIFOS	ND		ug/L	0.1	0.04	1.0		Qualitative analysis
115-32-2	DICOFOL	ND		ug/L	1	-	1.0		Qualitative analysis
298-00-0	METHYL PARATHION	ND		ug/L	0.5	0.1	1.0		Qualitative analysis
732-11-6	PHOSMET	ND		ug/L	0.5	-	1.0		Qualitative analysis
43121-43-3	TRIADIMEFON	ND		ug/L	0.1	0.07	1.0		Qualitative analysis
68694-11-1	TRIFLUMIZOLE	ND		ug/L	1.0	1.0	1.0		Qualitative analysis
950-37-8	METHIDATHINON	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
88671-89-0	MYCLOBUTANIL	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
51235-04-2	HEXAZINONE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis

[illegible]esult of: NA - indicates the compound was not analyzed.
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D.F. - Dilution Factor.

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Microbiology | 360.671.0688 • 360.671.1577fax

WSDOE Lab C1251

DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 06-00222
Project: HBDIC Recharge Project

Lab Number: 449
Field ID: Intake
Sample Description: HBDIC Recharge Project (WWBWC)
Matrix: Drinking Water
Collect Date: 1/4/2006
Extraction Date: 1/10/2006
Extraction Method: 3535

Report Date: 5/2/2008
Date Analyzed: 1/11/2006
Analyst: CO
Peer Review: MVA
Analytical Method: 525.2

SOC for Walla Walla

CAS ID#	COMPOUNDS	RESULT	Flag	Units	PQL	MDL	D.F.	Batch	COMMENT
2312-35-8	PROPARGITE	ND		ug/L		-	1.0	525_070120	Qualitative analysis
60-51-5	DIMETHOATE	ND		ug/L	0.5	0.03	1.0	525_070120	Qualitative analysis
57837-19-1	METALAXYL	ND		ug/L	0.1	-	1.0		Qualitative analysis
15299-99-7	NAPROPAMIDE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis
86-86-2	1-NAPHTHALENEACETAMIDE	ND		ug/L	0.5	-	1.0		Qualitative analysis
60168-88-9	FENARIMOL	ND		ug/L	0.1	0.03	1.0		Qualitative analysis
[illegible]6-34-7	MEVINPHOS	ND		ug/l	0.1	0.03	1.0		Qualitative analysis
[illegible]-50-0	AZINPHOS-METHYL	ND		ug/L	0.5	0.12	1.0		Qualitative analysis
2921-88-2	CHLORPYRIFOS	ND		ug/L	0.1	0.04	1.0		Qualitative analysis
115-32-2	DICOFOL	ND		ug/L	1	-	1.0		Qualitative analysis
298-00-0	METHYL PARATHION	ND		ug/L	0.5	0.1	1.0		Qualitative analysis
732-11-6	PHOSMET	ND		ug/L	0.5	-	1.0		Qualitative analysis
43121-43-3	TRIADIMEFON	ND		ug/L	0.1	0.07	1.0		Qualitative analysis
68694-11-1	TRIFLUMIZOLE	ND		ug/L	1.0	1.0	1.0		Qualitative analysis
950-37-8	METHIDATHINON	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
88671-89-0	MYCLOBUTANIL	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
51235-04-2	HEXAZINONE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis

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WSDOE Lab C1251

DATA REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Lab Number: 24845
Field ID: 74115
Sample Description: Intake
Matrix: Surface Water
Collect Date: 12/8/2004
Extraction Date: 12/20/2004
Extraction Method: 3535

Reference Number: 04-12075
Project: 74115/74116

Report Date: 5/2/2008
Date Analyzed: 12/21/2004
Analyst: CO
Peer Review: MVA
Analytical Method: 525.2

SOC for Walla Walla

CAS ID#	COMPOUNDS	RESULT	Flag	Units	PQL	MDL	D.F.	Batch	COMMENT
2312-35-8	PROPARGITE	ND		ug/L		-	1.0	525_070120	Qualitative analysis
60-51-5	DIMETHOATE	ND		ug/L	0.5	0.03	1.0	525_070120	Qualitative analysis
57837-19-1	METALAXYL	ND		ug/L	0.1	-	1.0		Qualitative analysis
15299-99-7	NAPROPAMIDE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis
86-86-2	1-NAPHTHALENEACETAMIDE	ND		ug/L	0.5	-	1.0		Qualitative analysis
60168-88-9	FENARIMOL	ND		ug/L	0.1	0.03	1.0		Qualitative analysis
[illegible]6-34-7	MEVINPHOS	ND		ug/l	0.1	0.03	1.0		Qualitative analysis
[illegible]50-0	AZINPHOS-METHYL	ND		ug/L	0.5	0.12	1.0		Qualitative analysis
2921-88-2	CHLORPYRIFOS	ND		ug/L	0.1	0.04	1.0		Qualitative analysis
115-32-2	DICOFOL	ND		ug/L	1	-	1.0		Qualitative analysis
298-00-0	METHYL PARATHION	ND		ug/L	0.5	0.1	1.0		Qualitative analysis
732-11-6	PHOSMET	ND		ug/L	0.5	-	1.0		Qualitative analysis
43121-43-3	TRIADIMEFON	ND		ug/L	0.1	0.07	1.0		Qualitative analysis
68694-11-1	TRIFLUMIZOLE	ND		ug/L	1.0	1.0	1.0		Qualitative analysis
950-37-8	METHIDATHINON	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
88671-89-0	MYCLOBUTANIL	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
51235-04-2	HEXAZINONE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis

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WSDOE Lab C1251

DATA REPORT

Client Name: KUO Testing Labs Inc
337 S 1st
Othello, WA 99344

Lab Number: 4659
Field ID: 74116
Sample Description: intake
Matrix: Drinking Water
Collect Date: 4/13/2004
Extraction Date: 4/19/2004
Extraction Method: 3535

Reference Number: 04-2366
Project: 70292

Report Date: 5/2/2008
Date Analyzed: 4/21/2004
Analyst: CO
Peer Review: MVA
Analytical Method: 525.2

SOC for Walla Walla

CAS ID#	COMPOUNDS	RESULT	Flag	Units	PQL	MDL	D.F.	Batch	COMMENT
2312-35-8	PROPARGITE	ND		ug/L		-	1.0	525_070120	Qualitative analysis
60-51-5	DIMETHOATE	ND		ug/L	0.5	0.03	1.0	525_070120	Qualitative analysis
57837-19-1	METALAXYL	ND		ug/L	0.1	-	1.0		Qualitative analysis
15299-99-7	NAPROPAMIDE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis
86-86-2	1-NAPHTHALENEACETAMIDE	ND		ug/L	0.5	-	1.0		Qualitative analysis
60168-88-9	FENARIMOL	ND		ug/L	0.1	0.03	1.0		Qualitative analysis
[illegible]6-34-7	MEVINPHOS	ND		ug/l	0.1	0.03	1.0		Qualitative analysis
[illegible]-50-0	AZINPHOS-METHYL	ND		ug/L	0.5	0.12	1.0		Qualitative analysis
2921-88-2	CHLORPYRIFOS	ND		ug/L	0.1	0.04	1.0		Qualitative analysis
115-32-2	DICOFOL	ND		ug/L	1	-	1.0		Qualitative analysis
298-00-0	METHYL PARATHION	ND		ug/L	0.5	0.1	1.0		Qualitative analysis
732-11-6	PHOSMET	ND		ug/L	0.5	-	1.0		Qualitative analysis
43121-43-3	TRIADIMEFON	ND		ug/L	0.1	0.07	1.0		Qualitative analysis
68694-11-1	TRIFLUMIZOLE	ND		ug/L	1.0	1.0	1.0		Qualitative analysis
950-37-8	METHIDATHINON	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
88671-89-0	MYCLOBUTANIL	ND		ug/L	0.5	0.5	1.0		Qualitative analysis
51235-04-2	HEXAZINONE	ND		ug/L	0.1	0.05	1.0		Qualitative analysis

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Mill Creek
Water Treatment Plant
Laboratory
581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681
Date: 05/28/08

System ID / Name: Walla Walla Basin Watershed Council
Amount Due: $66.00

Sampler: Troy Baker
Invoice Number: 8005

Address: P.O. Box 68
Date Collected: 5/27/08

City: Milton-Freewater
Date Analyzed: 5/27/08

State: OR Zip Code: 97874
Lab Analyst: *Neher*

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater ~ 20th Edition~

Test Method 9223B			
Sample ID #1	**Results**	**Units**	**Lab Number**
L-S1	Presence	Presence / Absence	143-05637
	Total Coliform Present / E-Coli Absent___Present_X_		
Sample ID #2	**Results**	**Units**	**Lab Number**
L-S2	Presence	Presence / Absence	143-05638
	Total Coliform Present / E-Coli Absent___Present_X_		
Sample ID #3	**Results**	**Units**	**Lab Number**
HB/DC OBS-1	Presence	Presence / Absence	143-05639
	Total Coliform Present / E-Coli Absent_X_Present___		

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

POSTED

Signature Lab Director : Toni Krebs 5/29/08 (date)

APPROVED TO PAY

Troy Baker

CHARGE TO T-2.1 & 2.2

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

Mill Creek Water Treatment Plant Laboratory

581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
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System ID / Name: Walla Walla Basin Watershed Council

Amount Due: $75.00

Sampler: Troy Baker

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Address: P.O. Box 68

Date Collected: 5/27/08

City: Milton-Freewater

Date Analyzed: 5/27/08

State: OR Zip Code: 97874

Lab Analyst: *Neher*

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater ~ 20th Edition~

Test Method 9222D			
Sample ID #1	**Results**	**Units**	**Lab Number**
L-S1	TNTC	CFU's / 100 mL	143-05637
Sample ID #2	**Results**	**Units**	**Lab Number**
L-S2	TNTC	CFU's / 100 mL	143-05638
Sample ID #3	**Results**	**Units**	**Lab Number**
HB/DC OBS-1	0.0	CFU's / 100 mL	143-05639

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krels 5/29/08 (date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

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December 6, 2007

Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

RE: 07-16056 - Replacement Sample

Dear Project Manager,

Your project: Replacement Sample, was received on Tuesday December 04, 2007.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

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Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 12/6/2007
Reference Number: 07-16056
Project: Replacement Sample

Collected By:

Date Received: 12/4/2007
Peer Review: JJO

Lab Number: 36408 Sample Description: WWBWC - (R1595) Sample Date: 12/3/2007

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	**NITRATE-N**	**0.21**	0.100	0.015	mg/L	1.0	300.0	12/4/2007	BJ	I071204A	
16887-00-6	**CHLORIDE**	**0.8**	0.1	0.0097	mg/L	1.0	300.0	12/4/2007	BJ	I071204A	
14265-44-2	**ORTHO-PHOSPHATE**	**0.54**	0.01	0.005	mg/L	1.0	SM4500-P F	12/5/2007	SO	OPHOS-071205A	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 07-16056
Report Date: 12/06/07

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
OPHOS-071205A	ORTHO-PHOSPHATE	1.05	1.00	mg/L	SM4500-P F	105	70-130		LFB	

*Notation:

covery = (Result of Analysis)/(True Value) * 100

Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Reagent Blank

Reference Number: 07-16056
Report Date: 12/06/07

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
I071204A	CHLORIDE	ND		mg/L	300.0		0.10000		LRB	
	NITRATE-N	ND		mg/L	300.0		0.10000			
OPHOS-071205A	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		LRB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 07-16056
Report Date: 12/06/07

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
OPHOS-071205A	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		MB	

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

= Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: 07-16056
Report Date: 12/06/07

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
I071204A	CHLORIDE	29	30.0	mg/L	300.0	97	80-120		QCS	
	NITRATE-N	2.36	2.50	mg/L	300.0	94	80-120			
OPHOS-071205A	ORTHO-PHOSPHATE	0.48	0.48	mg/L	SM4500-P F	100	70-130		QCS	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

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QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 07-16056

Report Date: 12/6/2007

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
OPHOS-071205A									
	36408	ORTHO-PHOSPHATE	0.54	0.54	mg/L	**0.0**	0-50		DUP

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Reference Number: 07-16056

Report Date: 12/6/2007

ANALYTICAL LABORATORIES

Matrix Spike

Batch	Sample	Analyte	Result	Duplicate Spike Result	Duplicate Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	%RPD Limits	QC Qualifier	Comments
PHOS-071205A													
	36408	ORTHO-PHOSPHATE	0.54	1.47	1.00	mg/L	**93**	**96**	70-130	**3.2**	0-50	LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate samples with detections are listed in this report

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Microbiology | 360.671.0688 • 360.671.1577fax

CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Observation well #1
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635782
Report Date: 11/29/2007
Date Analyzed: 11/28/2007
Extraction Date: 531_071128
Analyst: CO
Peer Review: MWA
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.83		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	1.0		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.88		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.76		

Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Observation well #1
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635782
Report Date: 12/14/2007
Date Analyzed: 12/13/2007
Extraction Date: 508_071207
Analyst: MM/C(
Peer Review: MVA
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	**ND**	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	**ND**	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	**ND**	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	**ND**	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	**ND**	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	**ND**	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	**ND**	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	**ND**	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	**ND**	ug/L	1	0.5	3	

= Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.

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J - Estimated value.

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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Observation well #1
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635782
Report Date: 12/13/2007
Date Analyzed: 12/10/2007
Extraction Date: 525_071207
Analyst: MM/CC
Peer Review: MVA
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2 .	ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.

MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.

MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J - Estimated value.

ENCE ANALYTICAL LABORATORIES

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
218-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

^ Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Observation well #1
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635782
Report Date: 12/14/2007
Date Analyzed: 12/13/2007
Extraction Date: 515_071210
Analyst: JH/CO
Peer Review: MVA
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	**ND**	ug/L	0.2	0.11	70	
93-72-1	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.1	0.02	50	
87-86-5	PENTACHLOROPHENOL	**ND**	ug/L	0.1	0.044	1	
75-99-0	DALAPON	**ND**	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	**ND**	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	**ND**	ug/L	0.1	0.089	500	
	EPA Unregulated						
1918-00-9	DICAMBA	**ND**	ug/L	0.1	0.045		
	State Unregulated						
1861-32-1	TOTAL (DCPA & Metabolites)	**ND**	ug/L	0.1	0.089		
E-14-02-8	DCPA (ACID METABOLITES)	**ND**	ug/L	0.1	0.1		
94-82-6	2,4 DB	**ND**	ug/L	0.8	0.10		
93-76-5	2,4,5 T	**ND**	ug/L	0.1	0.044		
25057-89-0	BENTAZON	**ND**	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	**ND**	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	**ND**	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	**ND**	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.1	0.044		

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J - Estimated value.

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Microbiology | 360.671.0688 • 360.671.1577fax

CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Intake
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635783
Report Date: 11/29/2007
Date Analyzed: 11/28/2007
Extraction Date: 531_071128
Analyst: CO
Peer Review: MWH
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.83		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	1.0		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.88		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.76		

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
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DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Intake
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635783
Report Date: 12/14/2007
Date Analyzed: 12/13/2007
Extraction Date: 508_071207
Analyst: MM/CC
Peer Review: MVA
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	**ND**	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	**ND**	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	**ND**	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	**ND**	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	**ND**	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	**ND**	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	**ND**	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	**ND**	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	**ND**	ug/L	1	0.5	3	

= Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Intake
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635783
Report Date: 12/13/2007
Date Analyzed: 12/10/2007
Extraction Date: 525_071207
Analyst: MM/C(
Peer Review: MVA
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2	.ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		

= Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.

MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
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J - Estimated value.

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
218-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL) if requested

- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.

PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.

MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J - Estimated value.

ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 07-15764

Project: HBDIC Recharge Project
Field ID: Intake
Sample Description: @HBDIC Recharge
Sampled By:
Sample Date: 11/26/2007
Source Type:
Sampler Phone:

Lab Number: 04635783
Report Date: 12/14/2007
Date Analyzed: 12/13/2007
Extraction Date: 515_071210
Analyst: JH/CO
Peer Review: MVA
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	**ND**	ug/L	0.2	0.11	70	
93-72-1	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.1	0.02	50	
87-86-5	PENTACHLOROPHENOL	**ND**	ug/L	0.1	0.044	1	
75-99-0	DALAPON	**ND**	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	**ND**	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	**ND**	ug/L	0.1	0.089	500	
	EPA Unregulated						
1918-00-9	DICAMBA	**ND**	ug/L	0.1	0.045		
	State Unregulated						
1861-32-1	TOTAL (DCPA & Metabolites)	**ND**	ug/L	0.1	0.089		
E-14-02-8	DCPA (ACID METABOLITES)	**ND**	ug/L	0.1	0.1		
94-82-6	2,4 DB	**ND**	ug/L	0.8	0.10		
93-76-5	2,4,5 T	**ND**	ug/L	0.1	0.044		
25057-89-0	BENTAZON	**ND**	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	**ND**	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	**ND**	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	**ND**	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.1	0.044		

- Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
L- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

Fall 2007 HBDIC WQ

	HBDIC Recharge Project	Date Collected	Time	Date Received	Who	Total Nitrogen	COD	Nitrate-N	Conductivity	TDS	Chloride	Orthophosphate	Fecal Coliforms (CFUs)	EPA 525 SOC Package (EPA drinking tests: 525, 515,508, 531)	Comments
Observation Well #1	Operating, first WQ sampling of season	11/26/2007	9:15	11/27/2007	Bower/Lewis	ND	ND	x	77.6	73	x	x	1	No Detections	Bottle mix up orginally marked OBS 1 as Intake. It was corrected at Edge. Missing bottles meant missing some Basic Chemical samples. Resampled the next week.
Intake Structure	Operating, first WQ sampling of season	11/26/2007	9:30	11/27/2007	Bower/Lewis	ND	ND	ND	79.9	68	0.7	0.57	11/14.0 (duplicate)	No Detections	x
Observation Well #1 (replacement sample)	Operating, first WQ sampling of season	12/3/2007	9:00	12/4/2007	Lewis			0.21			0.8	0.54			Quality Control Lab report included in appendices of data.

table for HBDIC monitoring folder

ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 12/14/2007
Reference Number: 07-15764
Project: HBDIC Recharge Project

Collected By:

Date Received: 11/27/2007
Peer Review: JDJ

Lab Number: 35782 Sample Description: Observation well #1 - @HBDIC Recharge Sample Date: 11/26/2007

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
E-10264	**TOTAL KJELDAHL NITROGEN**	**ND**	0.5	0.1391	mg/L	1.0	SM4500-Norg C	12/4/2007	SO	TKN-071204	
E-10117	**CHEMICAL OXYGEN DEMAND**	**ND**	8.0	1.00	mg/L	1.0	SM5220 D	12/4/2007	MAK	COD_071204	
E-10184	**ELECTRICAL CONDUCTIVITY**	**77.6**	10	10	uS/cm	1.0	SM2510 B	11/30/2007	CCN	EC_071130	
E-10173	**TOTAL DISSOLVED SOLIDS**	**73**	10	10	mg/L	1.0	SM2540 C	11/30/2007	CCN	TDS_071130	

Lab Number: 35783 Sample Description: Intake - @HBDIC Recharge Sample Date: 11/26/2007

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
E-10264	**TOTAL KJELDAHL NITROGEN**	**ND**	0.5	0.1391	mg/L	1.0	SM4500-Norg C	12/4/2007	SO	TKN-071204	
E-10117	**CHEMICAL OXYGEN DEMAND**	**ND**	8.0	1.00	mg/L	1.0	SM5220 D	12/4/2007	MAK	COD_071204	
14797-55-8	**NITRATE-N**	**ND**	0.100	0.015	mg/L	1.0	300.0	11/27/2007	BJ	I071127A	
16887-00-6	**CHLORIDE**	**0.7**	0.1	0.0097	mg/L	1.0	300.0	11/27/2007	BJ	I071127A	
E-10184	**ELECTRICAL CONDUCTIVITY**	**79.9**	10	10	uS/cm	1.0	SM2510 B	11/28/2007	CCN	EC_071128	
E-10173	**TOTAL DISSOLVED SOLIDS**	**68**	10	10	mg/L	1.0	SM2540 C	11/30/2007	CCN	TDS_071130	
14265-44-2	**ORTHO-PHOSPHATE**	**0.57**	0.01	0.005	mg/L	1.0	SM4500-P F	11/28/2007	SO	OPHOS-071128	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

Page 1 of 2

2,680

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

Report to: Walla Walla Basin Watershed Coor.	Bill to: Walla Walla Basin Watershed County	For Lab Use Only	
Ship Address: 810 S Main Street	Address: 810 S Main Street	Ref #	
City: Milton-Freewt St. OR Zip: 97862	City: Milton-Freewa St. OR Zip: 97862	Check Regulatory Program	
Attn: Bob Bower	Phone: FAX:	☐ Safe Drinking Water Act	
Phone: 541.938.2170 FAX	P.O.#: Attn:	☐ Clean Water Act	
Email: bob.bower@wwbwc.org	☐ Visa ☐ M/C ☐ A/E Expires: /	☐ RCRA / CERCLA	
Project:	Card#:	☐ Other	

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The lab you can trust

1620 S. Walnut St.
Burlington, WA 98233
1.800.755.9295

805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

Instructions

1. Use one line per sample.
2. Be specific in analysis requests.
3. Check off analyses to be performed for each sample.
4. Enter number of containers.

Turn Around Time Required
- [X] Standard
- [ ] Half-time (50% surcharge)
- [ ] Quickest (100% surcharge)
- [ ] Other

Analyses Requested

	Field ID	Location	Grab/ Comp.	Matrix	Date	Time	SOC Package	TKN, COD	NO3, o-PO4, Cl, TDS	1 Set HCL Green caps only					Number of Containers
1	INTAKE	INTAKE AT RODIC RECHARGE			11/26/2	9:30	X	X	X	X					1
2	observation														
3	well #1 (OBS	observation well			11/26/2	9:15	X	X	X	X					
4															
5															
6															
7															
8															
9															
10															

CO002680

Special Instructions Conditions on Receipt: 1 - duplicate on INTA...

Sampled by: Bill Lester Phone: 541 938 2170 FAX: same Email: bob.bower@wwbwc.org Total Containers: 3 of 3

Sample Receipt Request (Must include FAX or Email) ☐

Relinquished by	Date	Time	Received by	Date	Time

	Yes	No	N/A
Custody seals intact	☐	☐	☐
Sample temp_____C satisfactory	☐	☐	☐
Samples received intact	☐	☐	
Chain of custody & labels agree	☐	☐	

548.2 Endothall $130
547 Glyphosate $118
549 Diquat $141
UCMR 2 List 1 (EPA 527, 529) $575
UCMR 2 List 2 (EPA 525.2, 535, 521) $865
Nitrosamines (521) for DSMRT $300

Nitrate $18
Chloride $18
Arsenic $18
Lead and Copper Rule (Special Sampling) $22
Total Organic Carbon (TOC) $$$
Complete Inorganics $289

CO002680

Questions for State Regulations

Questions regarding drinking water regulations, system monitoring requirements, and sampling information as to location, source type or [illegible] should be directed to:

SW Regional Office – Belle Fuchs (360) 586-5179
NW Regional Office – Steve Hulsman (253) 395-6750
Eastern Regional Office – Anne Wahlman (509) 456-6378

07-15764
35782 - 35783

FAX NO. :15419382170 Nov. 27 2007 11:59AM P2

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Burlington WA (Corporate Office) | 1620 S. Walnut St. – 98233 | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 – 98225 | 360.715-1212• 360.671.1577fax

Water Sample Information (WSI) Inorganic & Organic Chemical Analysis

Client & Billing Information

Report To:	**Bob Bower**	Bill To:	**Walla Walla Basin Watershed Council**
Ship Address:	**810 S Main Street**	Address:	**810 S Main Street**
City:	**Milton-Freewater** St: **OR** Zip: **97862**	City:	**Milton-Freewater** St: **OR** Zip: **97862**
Phone:	**541.938-2170** Fax:	Phone:	
Email:	**bob.bower@wwwbwc.org**	P.O.#	
Contact:	**Bob Bower**	☐ Visa ☐ M/C ☐ A/E	Expires /
Project		Card #	

General Sampling Information

1. Date Collected: 11/26/7 Time Collected: 9:30-9:50 ☒ AM ☐ PM
2. Collected By: W Lewis Telephone: 5419382170
3. Specific Location: INTAKE structure @ HBDIC Recharge Project

Public Water System (Fill out Form Completely)

4. System ID Number: —
5. DOH Source Number: ☐ Check here if this a New Source.
   (If sample is blended form more than one source, list all.)
6. Group: ☐ A ☐ B
7. System Name:
8. Source Type: ☒ Surface ☐ Well/Ground Water ☐ Well Field ☐ Spring ☐ Purchased
9. County: Umatilla
10. ☐ Check here if this analysis is for Compliance with State regulations for Public Water Systems. (Resluts will be sent to you and the State.)
11. Sample taken: ☒ Before Treatment ☐ After Treatment ☐ No Treatment ☐ In Distribution
12. Utility's Name for this source:
13. Treatment Type: ☒ None ☐ Aeration ☐ Filration ☐ Chlorination ☐ Fluoridation ☐ Softener ☐ Other
14. **COMPOSITE INFORMATION** (Applies to Multiple Sources Only) If sample is to be composited in lab, list all sources.
    If you want the lab to composite samples from your system **INITIAL here** _____.
    1. 2. 3. 4. 5. 6.
15. Remarks:

Analysis To Perform (Please Check Box)

Frequently requested tests are listed below. For others, please list under Other Analysis.

☐ SOC Package (525.2, 515.1, 531.1)	$590	☐ Snohomish County Building Permit	$157	☐ Radium 228	$90
☐ 525.2 Pesticides	$295	☐ Whatcom County Building Permit	$157	☐ Gross Alpha & Beta	$95
☐ 515.1 Herbicides	$186	☐ Skagit County Building Permit	$157	☐ EWS Well Report	$210
☐ 531.1 Carbamates	$215	☐ Island County Building Permit	$44	☐ **Other Analysis** (Please List)	
☐ 524.2 Volatile Organic Compounds	$175	☐ San Juan County Building Permit	$93		
☐ 504.1 EDB, DBCP/1,2,3-TCP	$105	☐ King County Building Permit	$34	_____	
☐ 552.2 Haloacetic Acids	$140	☐ ***Discounted Nuisance Test***	$18	_____	
☐ 524.2 Trihalomethanes (THM)	$81	*(Only with Snohomish, Whatcom, Skagit or San Juan Bldg. Permit)*		_____	
☐ 510.1 Maximum Total Trihalomethanes Potential	$125	☐ Nuisance Test (Hardness, Iron, Manganese, pH)	$44	_____	
☐ 548.2 Endothall	$130	☐ Nitrate	$18		
☐ 547 Glyphosate	$118	☐ Chloride	$18		
☐ 549 Diquat	$141	☐ Arsenic	$18		
☐ UCMR 2 List 1(EPA 527, 529)	$575	☐ Lead and Copper Rule **(Special Sampling)**	$22		
☐ UCMR 2 List 2 (EPA 525.2, 535, 521)	$865	☐ Total Organic Carbon (TOC)	$38		
☐ Nitrosamines (521) for DSMRT	$300	☐ Complete Inorganics	$289		

CO002680

Questions for State Regulations

Questions regarding drinking water regulations, system monitoring requirements, and sampling information as to location, source type or method should be directed to:

SW Regional Office – Belle Fuchs (360) 586-5179
NW Regional Office – Steve Hulsman (253) 395-6750
Eastern Regional Office – Anita Waterman (509) 456-2475

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Burlington WA (Corporate Office) | 1620 S. Walnut St. – 98233 | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 – 98225 | 360.715-1212• 360.671.1577fax

Water Sample Information (WSI) Inorganic & Organic Chemical Analysis

Client & Billing Information

Report To:	**Bob Bower**	Bill To:	**Walla Walla Basin Watershed Council**
Ship Address:	**810 S Main Street**	Address:	**810 S Main Street**
City:	**Milton-Freewater** St: **OR** Zip: **97862**	City:	**Milton-Freewater** St: **OR** Zip: **97862**
Phone:	**541.938-2170** Fax:	Phone:	
Email:	**bob.bower@wwwbwc.org**	P.O.#	
Contact:	**Bob Bower**	☐ Visa ☐ M/C ☐ A/E	Expires /
Project		Card #	

General Sampling Information

1. Date Collected: 11/27/7 Time Collected: 9:15-9:30 ☒ AM ☐ PM
2. Collected By: W Lewis Telephone: 5419382170
3. Specific Location: OBSERVATION WELL #1 @ HBDIC Recharge Project

Public Water System (Fill out Form Completely)

4. System ID Number: —
5. DOH Source Number: ☐ Check here if this a New Source.
   (If sample is blended form more than one source, list all.)
6. Group: ☐ A ☐ B
7. System Name: HBDIC Recharge
8. Source Type: ☐ Surface ☒ Well/Ground Water ☐ Well Field ☐ Spring ☐ Purchased
9. County:
10. ☐ Check here if this analysis is for Compliance with State regulations for Public Water Systems. (Resluts will be sent to you and the State.)
11. Sample taken: ☒ Before Treatment ☐ After Treatment ☐ No Treatment ☐ In Distribution
12. Utility's Name for this source:
13. Treatment Type: ☒ None ☐ Aeration ☐ Filration ☐ Chlorination ☐ Fluoridation ☐ Softener ☐ Other
14. **COMPOSITE INFORMATION** (Applies to Multiple Sources Only) If sample is to be composited in lab, list all sources.
    If you want the lab to composite samples from your system **INITIAL here** _____.
    1. 2. 3. 4. 5. 6.
15. Remarks:

Analysis To Perform (Please Check Box)

Frequently requested tests are listed below. For others, please list under Other Analysis.

☐ SOC Package (525.2, 515.1, 531.1)	$590	☐ Snohomish County Building Permit	$157	☐ Radium 228	$90
☐ 525.2 Pesticides	$295	☐ Whatcom County Building Permit	$157	☐ Gross Alpha & Beta	$95
☐ 515.1 Herbicides	$186	☐ Skagit County Building Permit	$157	☐ EWS Well Report	$210
☐ 531.1 Carbamates	$215	☐ Island County Building Permit	$44	☐ **Other Analysis** (Please List)	
☐ 524.2 Volatile Organic Compounds	$175	☐ San Juan County Building Permit	$93		
☐ 504.1 EDB, DBCP/1,2,3-TCP	$105	☐ King County Building Permit	$34		
☐ 552.2 Haloacetic Acids	$140	☐ ***Discounted Nuisance Test***	$18		
☐ 524.2 Trihalomethanes (THM)	$81	*(Only with Snohomish, Whatcom, Skagit or San Juan Bldg. Permit)*			
☐ 510.1 Maximum Total Trihalomethanes Potential	$125	☐ Nuisance Test (Hardness, Iron, Manganese, pH)	$44		
☐ 548.2 Endothall	$130	☐ Nitrate	$18		
☐ 547 Glyphosate	$118	☐ Chloride	$18		
☐ 549 Diquat	$141	☐ Arsenic	$18		
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☐ Nitrosamines (521) for DSMRT	$300	☐ Complete Inorganics	$289		

CO002680

Questions for State Regulations

Questions regarding drinking water regulations, system monitoring requirements, and sampling information as to location, source type or method should be directed to:

SW Regional Office – Belle Fuchs (360) 586-5179
NW Regional Office – Steve Hulsman (253) 395-6750
Eastern Regional Office – Anita Waterman (509) 456-2475

Mill Creek Water Treatment Plant Laboratory

581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681

Date: 12/18/07

System ID / Name: Walla Walla Basin Watershed Council

Amount Due: $75.00

Sampler: Bob Bower

Invoice Number: 7003

Address: P.O. Box 68

Date Collected: 11/26/07

City: Milton-Freewater

Date Analyzed: 11/26/07

State: Oregon Zip Code: 97862

Lab Analyst: Skifstad

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater ~ 20th Edition~

Test Method 9222D				
Sample ID #1	**Results**		**Units**	**Lab Number**
OBS #1	1.0		CFU's / 100 mL	143-04967
Sample ID #2	**Results**		**Units**	**Lab Number**
Intake #1A	11.0		CFU's / 100 mL	143-04968
Sample ID #3	**Results**		**Units**	**Lab Number**
Intake #1B	14.0		CFU's / 100 mL	143-04969

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krelas 12/19/07 (date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
11/26/07	9:30 ☒ AM ☐ PM	Walla Walla

Type of Water System (check only one box)
☑ Group A Public ☐ Private Household
☐ Group B Public ☐ Other

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# 9 2 5 0 0 2
System Name: Walla Walla
Contact Person: Tom Krebs
Day Phone: (509) 522-3775 Cell Phone: (509) 520-6059
Eve. Phone: (509) 529-8555 FAX: (509) 529-9681
Send results to: (Print full name, address and zip code)
City of Walla Walla (Water Dept.)
P.O. Box 478
Walla Walla, WA 99362

SAMPLE INFORMATION

Sample collected by (name): BOB BOWER
Specific location where sample collected (address or sample site, and type of faucet): INTAKE
Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
Unsatisfactory routine collect date: ___/___/___
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☐ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources) ☐ Total Coliform
S | | | | ☐ Fecal Coliform
Public Systems must provide Source Number from (WFI)

4. ☒ **Sample Collected for Information Only** (MFC)
Construction_____ Repairs_____ Private Residence_____ Other X

LAB USE ONLY — DRINKING WATER RESULTS — LAB USE ONLY

☐ **Satisfactory** Total Coliform Absent

☐ **Unsatisfactory** Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 1.0 /100ml.

MICR Method Code: ☒ 1140 ☐ 1340 ☐ 2720
Date and Time Received: 11/26/07 @ 10:20 AM
Date Analyzed: 11/26/07 (CS)
Date Reported: 11/27/07
Lab/Sample Number: 143- 04968
Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

WATER SUPPLIER COPY

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
11/26/08	9:15 ☒ AM ☐ PM	Walla Walla

Type of Water System (check only one box)
☑ Group A Public ☐ Private Household
☐ Group B Public ☐ Other

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# 9 2 5 0 0 2
System Name: Walla Walla
Contact Person: Tom Krebs
Day Phone: (509) 522-3775 Cell Phone: (509) 520-6059
Eve. Phone: (509) 529-8555 FAX: (509) 529-9681
Send results to: (Print full name, address and zip code)
City of Walla Walla (Water Dept.)
P.O. Box 478
Walla Walla, WA 99362

SAMPLE INFORMATION

Sample collected by (name): BOB BOWER
Specific location where sample collected (address or sample site, and type of faucet): OBS #1
Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
Unsatisfactory routine collect date: ___/___/___
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☐ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources) ☐ Total Coliform
S | | | | ☐ Fecal Coliform
Public Systems must provide Source Number from (WFI)

4. ☒ **Sample Collected for Information Only** (MFC)
Construction_____ Repairs_____ Private Residence_____ Other X

LAB USE ONLY — DRINKING WATER RESULTS — LAB USE ONLY

☐ **Satisfactory** Total Coliform Absent

☐ **Unsatisfactory** Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 1.0 /100ml.

MICR Method Code: ☒ 1140 ☐ 1340 ☐ 2720
Date and Time Received: 11/26/07 @ 10:20 AM
Date Analyzed: 11/26/07 (CS)
Date Reported: 11/27/07
Lab/Sample Number: 143- 04967
Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

WATER SUPPLIER COPY

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

-,680

Report to:	Walla Walla Basin Watershed Cour	Bill to:	Walla Walla Basin Watershed Counc
Ship Address:	810 S Main Street	Address:	810 S Main Street
City:	Milton-Freewa St: OR Zip: 97862	City:	Milton-Freewa St: OR Zip: 97862
Attn:	Bob Bower	Phone:	FAX:
Phone:	541.938-2170 FAX:	P.O.#:	Attn:
Email:	bob.bower@wwwbwc.org	☐ Visa ☐ M/C ☐ A/E	Expires /
Project		Card#:	

For Lab Use Only
Ref #

Check Regulatory Program
- ☐ Safe Drinking Water Act
- ☐ Clean Water Act
- ☐ RCRA / CERCLA
- ☐ Other

EDGE ANALYTICAL
"The lab you can trust!"
1620 S. Walnut St.
Burlington, WA 98233
1.800.755.9295

805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

Instructions
1. Use one line per sample.
2. Be specific in analysis requests.
3. Check off analyses to be performed for each sample.
4. Enter number of containers.

Turn Around Time Required
- ☒ Standard
- ☐ Half-time (50% surcharge)
- ☐ Quickest (100% surcharge)
- ☐ Other

Analyses Requested

CO002680

	Field ID	Location	Grab/ Comp.	Matrix	Date	Time	SOC Package	TKN, COD	NO3, o-PO4, Cl, TDS	1 Set HCL Green caps only.					Number of Containers	Special Instructions Conditions on Receipt
1	INTAKE	INTAKE AT HBDIC RECHARGE			11/26/2	9:30	X	X	X	X					1	Duplicate on TKP...
2	observation well #1 (OBS	observation well			11/26/2	9:15	X	X	X	X						
3																
4																
5																
6																
7																
8																
9																
10																

Sampled by: Will Lewis Phone: 541 938 2170 FAX: same Email: bob.bower@wwbw Total Containers 1 of 1

Sample Receipt Request (Must include FAX or Email) ☐

Relinquished by	Date	Time	Received by	Date	Time

	Yes	No	N/A
Custody seals intact	☐	☐	☐
Sample temp_____C satisfactory	☐	☐	☐
Samples received intact	☐	☐	
Chain of custody & labels agree	☐	☐	

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Microbiology | 360.671.0688 • 360.671.1577fax

July 9, 2008

Bob Bower
Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

RE: 08-07095 - Locker/Hall Wetland/HBBIC

Dear Bob Bower,

Your project: Locker/Hall Wetland/HBBIC, was received on Wednesday May 28, 2008.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

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Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Report Date: 6/16/2008
Reference Number: 08-07095
Project: Locker/Hall Wetland/HBBIC

Collected By: T. Baker

Date Received: 5/28/2008
Peer Review:

Lab Number: 15124 Sample Description: HBDIC OBS1 - HBDIC Sample Date: 5/27/2008

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	NITRATE-N	0.17	0.01	0.0007	mg/L	1.0	SM4500-NO3 F	5/28/2008	SO	NO3NO2-080528	
15541-45-4	BROMATE	ND	0.5	0.068	ug/L	1.0	317.0	6/6/2008	MVP	317_080606A	
E-11778	HARDNESS	22.1	3.30	0.055	mg CaC(	1.0	200.7	5/30/2008	BJ	200.7-080530A	
E-10117	CHEMICAL OXYGEN DEMAND	11	8.0	2.0	mg/L	1.0	SM5220 D	6/4/2008	MAK	COD_080604	
E-10139	HYDROGEN ION (pH)	7.18			pH Units	1.0	SM4500-H+ B	5/28/2008	CCN	PH_080528	
E-10184	ELECTRICAL CONDUCTIVITY	63.4	10		uS/cm	1.0	SM2510 B	6/2/2008	CCN	EC_080602	
E-10617	TURBIDITY	0.88	0.05	0.02	NTU	1.0	180.1	5/28/2008	CCN	TURB_080528	
16887-00-6	CHLORIDE	0.5	0.1	0.012	mg/L	1.0	300.0	5/28/2008	BJ	I080528A	
E-10173	TOTAL DISSOLVED SOLIDS	61	10		mg/L	1.0	SM2540 C	6/2/2008	CCN	TDS_080602	
14265-44-2	ORTHO-PHOSPHATE	0.17	0.01	0.005	mg/L	1.0	SM4500-P F	5/28/2008	SO	OPHOS-080528	

Lab Number: 15125 Sample Description: L-1 - Locker Rd Sample Date: 5/27/2008

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	NITRATE-N	5.86	0.05	0.0007	mg/L	5.0	SM4500-NO3 F	5/28/2008	SO	NO3NO2-080528	
16887-00-6	CHLORIDE	6.7	0.1	0.012	mg/L	1.0	300.0	5/28/2008	BJ	I080528A	
E-10173	TOTAL DISSOLVED SOLIDS	262	10		mg/L	1.0	SM2540 C	6/2/2008	CCN	TDS_080602	
15541-45-4	BROMATE	ND	0.5	0.068	ug/L	1.0	317.0	6/6/2008	MVP	317_080606A	
E-11778	HARDNESS	156	3.30	0.055	mg CaC(	1.0	200.7	5/30/2008	BJ	200.7-080530A	
E-10117	CHEMICAL OXYGEN DEMAND	ND	8.0	2.0	mg/L	1.0	SM5220 D	6/4/2008	MAK	COD_080604	
E-10139	HYDROGEN ION (pH)	7.00			pH Units	1.0	SM4500-H+ B	5/28/2008	CCN	PH_080528	
E-10184	ELECTRICAL CONDUCTIVITY	401	10		uS/cm	1.0	SM2510 B	6/2/2008	CCN	EC_080602	
E-10617	TURBIDITY	0.79	0.05	0.02	NTU	1.0	180.1	5/28/2008	CCN	TURB_080528	
14265-44-2	ORTHO-PHOSPHATE	0.27	0.01	0.005	mg/L	1.0	SM4500-P F	5/28/2008	SO	OPHOS-080528	

Lab Number: 15126 Sample Description: L-2 - Locker Rd Sample Date: 5/27/2008

CAS ID#	Analyte	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comments
14797-55-8	NITRATE-N	5.96	0.05	0.0007	mg/L	5.0	SM4500-NO3 F	5/28/2008	SO	NO3NO2-080528	
16887-00-6	CHLORIDE	6.5	0.1	0.012	mg/L	1.0	300.0	5/28/2008	BJ	I080528A	
E-10173	TOTAL DISSOLVED SOLIDS	205	10		mg/L	1.0	SM2540 C	6/2/2008	CCN	TDS_080602	
15541-45-4	BROMATE	ND	0.5	0.068	ug/L	1.0	317.0	6/11/2008	MVP	317_080611A	
E-11778	HARDNESS	117	3.30	0.055	mg CaC(	1.0	200.7	5/30/2008	BJ	200.7-080530A	
E-10117	CHEMICAL OXYGEN DEMAND	10	8.0	2.0	mg/L	1.0	SM5220 D	6/4/2008	MAK	COD_080604	
E-10139	HYDROGEN ION (pH)	6.93			pH Units	1.0	SM4500-H+ B	5/28/2008	CCN	PH_080528	

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
D.F. - Dilution Factor

WSDOE Lab C1251
WSDOH Lab 046

FORM: MULT_RESULT

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DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 08-07095

Project: Locker/Hall Wetland/HBBIC
Field ID: HBDIC OBS1
Sample Description: HBDIC
Sampled By: T. Baker
Sample Date: 5/27/2008
Source Type:
Sampler Phone:

Lab Number: 04615124
Report Date: 6/10/2008
Date Analyzed: 6/9/2008
Extraction Date: 508_080609
Analyst: GEB
Peer Review:
Analytical Method: 508.1
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	PCBs/Toxaphene						
1336-36-3	PCBS (Total Aroclors)	ND	ug/L	0.2		0.5	
11104-28-2	AROCLOR 1221	ND	ug/L	0.1	0.1^		
11141-16-5	AROCLOR 1232	ND	ug/L	0.1	0.1^		
53469-21-9	AROCLOR 1242	ND	ug/L	0.1	0.1^		
12672-29-6	AROCLOR 1248	ND	ug/L	0.1	0.1^		
11097-69-1	AROCLOR 1254	ND	ug/L	0.1	0.1^		
11096-82-5	AROCLOR 1260	ND	ug/L	0.1	0.08		
12674-11-2	AROCLOR 1016	ND	ug/L	0.1	0.1		
8001-35-2	TOXAPHENE	ND	ug/L	1	0.5	3	

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
MCL- Maximum Contaminant Level, maximum permissible level of a contaminant in water established by EPA, NPDWR. State Advisory Level (SAL) for Unregulated compounds.
A blank MCL or SAL value indicates a level is not currently established.
PQL - Practical Quantitation Limit is the concentration of the standard analyzed during the initial calibration.
MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.
J - Estimated value.

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 08-07095

Project: Locker/Hall Wetland/HBBIC
Field ID: HBDIC OBS1
Sample Description: HBDIC
Sampled By: T. Baker
Sample Date: 5/27/2008
Source Type:
Sampler Phone:

Lab Number: 04615124
Report Date: 6/16/2008
Date Analyzed: 6/11/2008
Extraction Date: 531_080611
Analyst: CO
Peer Review: MVA
Analytical Method: 531.2 Carbamates

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
23135-22-0	OXYMAL	ND	ug/L	1.0	0.81	200	
1563-66-2	CARBOFURAN	ND	ug/L	1.0	0.87	40	
	EPA Unregulated						
1646-87-3	ALDICARB SULFOXIDE	ND	ug/L	1.0	0.71		
1646-88-4	ALDICARB SULFONE	ND	ug/L	1.0	0.83		
16752-77-5	METHOMYL	ND	ug/L	1.0	0.86		
16655-82-6	3-HYDROXYCARBOFURAN	ND	ug/L	1.0	1.0		
116-06-3	ALDICARB	ND	ug/L	1.0	0.88		
63-25-2	CARBARYL	ND	ug/L	1.0	0.53		
	State Unregulated - Other						
114-26-1	PROPOXUR (BAYGON)	ND	ug/L	1.0	0.72		
2032-65-7	METHIOCARB	ND	ug/L	1.0	0.76		

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.

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MDL - Method Detection Limit is the lab's minimum concentration a compound can be measured and reported with 99% confidence that the compound concentration is greater than zero.

J - Estimated value.

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 08-07095

Project: Locker/Hall Wetland/HBBIC
Field ID: HBDIC OBS1
Sample Description: HBDIC
Sampled By: T. Baker
Sample Date: 5/27/2008
Source Type:
Sampler Phone:

Lab Number: 04615124
Report Date: 6/26/2008
Date Analyzed: 6/18/2008
Extraction Date: 515_080602
Analyst: CO
Peer Review: MU A
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
94-75-7	2,4 - D	ND	ug/L	0.2	0.11	70	
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L	0.1	0.02	50	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.1	0.044	1	
75-99-0	DALAPON	ND	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	ND	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	ND	ug/L	0.1	0.089	500	
	EPA Unregulated						
1918-00-9	DICAMBA	ND	ug/L	0.1	0.045		
	State Unregulated						
1861-32-1	TOTAL (DCPA & Metabolites)	ND	ug/L	0.1	0.089		
E-14-02-8	DCPA (ACID METABOLITES)	ND	ug/L	0.1	0.1		
94-82-6	2,4 DB	ND	ug/L	0.8	0.10		
93-76-5	2,4,5 T	ND	ug/L	0.1	0.044		
25057-89-0	BENTAZON	ND	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	ND	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	ND	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	ND	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.1	0.044		

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J - Estimated value.

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Microbiology | 360.671.0688 • 360.671.1577fax

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 08-07095

Project: Locker/Hall Wetland/HBBIC
Field ID: HBDIC OBS1
Sample Description: HBDIC
Sampled By: T. Baker
Sample Date: 5/27/2008
Source Type:
Sampler Phone:

Lab Number: 15124
Report Date: 7/3/2008
Date Analyzed: 6/16/2008
Extraction Date: 525_080609
Analyst: CO
Peer Review: MVA
Analytical Method: 525.2
Synthetic Organics

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
	EPA Regulated						
72-20-8	ENDRIN	ND	ug/L	0.1	0.030	2	
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
72-43-5	METHOXYCHLOR	ND	ug/L	0.1	0.015	40	
15972-60-8	ALACHLOR	ND	ug/L	0.1	0.044	2	
1912-24-9	ATRAZINE	ND	ug/L	0.1	0.030	3	
50-32-8	BENZO(A)PYRENE	ND	ug/L	0.1	0.012	0.2	
57-74-9	CHLORDANE, TECHNICAL	ND	ug/L	0.1	0.3	2	
103-23-1	DI(ETHYLHEXYL)-ADIPATE	ND	ug/L	0.1	0.022	400	
117-81-7	DI(ETHYLHEXYL)-PHTHALATE	ND	ug/L	0.1	0.063	6	
76-44-8	HEPTACHLOR	ND	ug/L	0.1	0.022	0.4	
1024-57-3	HEPTACHLOR EPOXIDE	ND	ug/L	0.1	0.02	0.2	
118-74-1	HEXACHLOROBENZENE	ND	ug/L	0.1	0.025	1	
77-47-4	HEXACHLOROCYCLO-PENTADIENE	ND	ug/L	0.1	0.024	50	
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.4	0.08	1	screening only / compliance by 515.1
	EPA Unregulated						
309-00-2	ALDRIN	ND	ug/L	0.1	0.022		
23184-66-9	BUTACHLOR	ND	ug/L	0.1	0.024		
60-57-1	DIELDRIN	ND	ug/L	0.1	0.031		
51218-45-2	METOLACHLOR	ND	ug/L	0.1	0.024		
21087-64-9	METRIBUZIN	ND	ug/L	0.1	0.030		
1918-16-7	PROPACHLOR	ND	ug/L	0.1	0.031		
	State Unregulated - Other						
314-40-9	BROMACIL	ND	ug/L	0.1	0.031		
5902-51-2	TERBACIL	ND	ug/L	0.1	0.043		

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EDGE ANALYTICAL LABORATORIES

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	Units	PQL	MDL	MCL	COMMENT
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		Unstable in Acidified Sample Matrix
759-94-4	EPTC	ND	ug/L	0.1	0.028		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
21725-46-2	CYANAZINE	ND	ug/L	0.1	0.13		Qualitative Analysis Only
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
56-38-2	PARATHION	ND	ug/L	0.1	0.022		
1582-09-8	TRIFLURALIN	ND	ug/L	0.1	0.024		
	- PAHs						
91-20-3	NAPTHALENE	ND	ug/L	0.1	0.1^		
86-73-7	FLUORENE	ND	ug/L	0.1	0.026		
208-96-8	ACENAPHTHYLENE	ND	ug/L	0.1	0.025		
83-32-9	ACENAPHTHENE	ND	ug/L	0.1	0.1^		
120-12-7	ANTHRACENE	ND	ug/L	0.1	0.012		
56-55-3	BENZ(A)ANTHRACENE	ND	ug/L	0.1	0.012		
205-99-2	BENZO(B)FLUORANTHENE	ND	ug/L	0.1	0.025		
191-24-2	BENZO(G,H,I)PERYLENE	ND	ug/L	0.1	0.025		
207-08-9	BENZO(K)FLUORANTHENE	ND	ug/L	0.1	0.022		
218-01-9	CHRYSENE	ND	ug/L	0.1	0.022		
53-70-3	DIBENZO(A,H)ANTHRACENE	ND	ug/L	0.1	0.024		
206-44-0	FLUORANTHENE	ND	ug/L	0.1	0.1^		
193-39-5	INDENO(1,2,3-CD)PYRENE	ND	ug/L	0.1	0.040		
85-01-8	PHENANTHRENE	ND	ug/L	0.1	0.015		
129-00-0	PYRENE	ND	ug/L	0.1	0.022		
	- Phthalates						
85-68-7	BENZYL BUTYL PHTHALATE	ND	ug/L	0.1	0.022		
84-74-2	DI-N-BUTYL PHTHALATE	ND	ug/L	0.1	0.085		
84-66-2	DIETHYL PHTHALATE	ND	ug/L	0.1	0.044		
131-11-3	DIMETHYL PHTHALATE	ND	ug/L	0.1	0.015		

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WSDOE Lab C1251

DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: 08-07095
Project: Locker/Hall Wetland/HBBIC

Lab Number: 15124
Field ID: HBDIC OBS1
Sample Description: HBDIC
Matrix: Water
Collect Date: 5/27/2008
Extraction Date: 6/9/2008
Extraction Method: 3535

Report Date: 7/9/2008
Date Analyzed: 6/25/2008
Analyst: CO
Peer Review: MvA
Analytical Method: 525.2

SOC for Walla Walla

CAS ID#	COMPOUNDS	RESULT	Flag	Units	PQL	MDL	D.F.	Batch	COMMENT
2312-35-8	PROPARGITE	ND		ug/L		-	1.0	525X_080609	Qualitative analysis
80-05-7	BISPHENOL-A	0.5		ug/L	0.1		1.0	525X_080609	
60-51-5	DIMETHOATE	ND		ug/L	0.5	0.03	1.0		
57837-19-1	METALAXYL	ND		ug/L	0.1	-	1.0		
15299-99-7	NAPROPAMIDE	ND		ug/L	0.1	0.05	1.0		
122-34-9	SIMAZINE	ND		ug/L	0.1	0.03	1.0		
86-86-2	1-NAPHTHALENEACETAMIDE	ND		ug/L	0.5	-	1.0		
333-41-5	DIAZINON	ND		ug/L	0.1	0.04	1.0		
60168-88-9	FENARIMOL	ND		ug/L	0.1	0.03	1.0		
58-89-9	LINDANE (BHC - GAMMA)	ND		ug/L	0.1	0.03	1.0		
7786-34-7	MEVINPHOS	ND		ug/l	0.1	0.03	1.0		
86-50-0	AZINPHOS-METHYL	ND		ug/L	0.5	0.12	1.0		
2921-88-2	CHLORPYRIFOS	ND		ug/L	0.1	0.04	1.0		
72-54-8	4,4-DDD	ND		ug/L	0.1	0.02	1.0		
72-55-9	4,4-DDE	ND		ug/L	0.1	0.02	1.0		
50-29-3	4,4-DDT	ND		ug/L	0.1	0.03	1.0		
115-32-2	DICOFOL	ND		ug/L	1	-	1.0		
121-75-5	MALATHION	ND		ug/L	0.1	0.05	1.0		
298-00-0	METHYL PARATHION	ND		ug/L	0.5	0.1	1.0		
56-38-2	PARATHION-ETHYL	ND		ug/L	0.1	0.05	1.0		
732-11-6	PHOSMET	ND		ug/L	0.5	-	1.0		
43121-43-3	TRIADIMEFON	ND		ug/L	0.1	0.07	1.0		
68694-11-1	TRIFLUMIZOLE	ND		ug/L	1.0	1.0	1.0		
950-37-8	METHIDATHINON	ND		ug/L	0.5	0.5	1.0		
88671-89-0	MYCLOBUTANIL	ND		ug/L	0.5	0.5	1.0		
51235-04-2	HEXAZINONE	ND		ug/L	0.1	0.05	1.0		

Result of: NA - indicates the compound was not analyzed.
Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.
ND - indicates the compound was not detected above the PQL or MDL.

PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor.

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
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Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
200.7-080530A	HARDNESS	70	69.5	mg/L	200.7	101	80-120		LFB	
508_080609	AROCLOR 1260	2.3	2	ug/L	508.1	115	60-140		LFB	
	TETRACHLORO-M-XYLENE (SURR)	93		%	508.1		70-130			
515_080602	2,4 - D	2.08	2	ug/L	515.1	104	70-130		LFB	
	2,4 - DCAA (SURR)	113		%	515.1		70-130			
	2,4 DB	9.55	8	ug/L	515.1	119	70-130			
	2,4,5 - TP (SILVEX)	1.11	1	ug/L	515.1	111	70-130			
	2,4,5 T	1	1	ug/L	515.1	100	70-130			
	ACIFLUORFEN	1.22	1	ug/L	515.1	122	70-130			
	BENTAZON	2.17	2	ug/L	515.1	109	70-130			
	CHLORAMBEN	0.91	1	ug/L	515.1	91	70-130			
	DALAPON	12.5	13	ug/L	515.1	96	70-130			
	DICAMBA	1.03	1	ug/L	515.1	103	70-130			
	DICHLORPROP	2.78	3	ug/L	515.1	93	70-130			
	DINOSEB	2.66	2	ug/L	515.1	133	70-130	AH		
	PENTACHLOROPHENOL	0.99	1	ug/L	515.1	99	70-130			
	PICLORAM	0.95	1	ug/L	515.1	95	70-130			
	TOTAL (DCPA & Metabolites)	1.16	1	ug/L	515.1	116	70-130			
525_080609	1,3-DIMETHYL-2-NITROBENZENE (Surr)	96		%	525.2		70-130		LFB	
	4,4-DDD	1.02	1	ug/L	525.2	102	70-130			
	4,4-DDE	1.03	1	ug/L	525.2	103	70-130			
	4,4-DDT	1.05	1	ug/L	525.2	105	70-130			
	ACENAPHTHYLENE	0.98	1	ug/L	525.2	98	70-130			
	ALACHLOR	2	2	ug/L	525.2	100	70-130			
	ALDRIN	0.98	1	ug/L	525.2	98	70-130			
	ANTHRACENE	0.68	1	ug/L	525.2	68	70-130	CC		
	ATRAZINE	2.09	2	ug/L	525.2	105	70-130			
	BENZ(A)ANTHRACENE	0.92	1	ug/L	525.2	92	70-130			
	BENZO(A)PYRENE	0.75	1	ug/L	525.2	75	70-130			
	BENZO(B)FLUORANTHENE	0.88	1	ug/L	525.2	88	70-130			

*Notation:

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525_080609	BENZO(G,H,I)PERYLENE	0.92	1	ug/L	525.2	92	70-130		LFB	
	BENZO(K)FLUORANTHENE	0.96	1	ug/L	525.2	96	70-130			
	BENZYL BUTYL PHTHALATE	1.05	1	ug/L	525.2	105	70-130			
	BROMACIL	1.03	1	ug/L	525.2	103	70-130			
	BUTACHLOR	1.02	1	ug/L	525.2	102	70-130			
	CHLORDANE, TECHNICAL	0.97	1	ug/L	525.2	97	70-130			
	CHRYSENE	1.03	1	ug/L	525.2	103	70-130			
	CYANAZINE	0.85	1	ug/L	525.2	85	70-130			
	DI(ETHYLHEXYL)-ADIPATE	1.04	1	ug/L	525.2	104	70-130			
	DI(ETHYLHEXYL)-PHTHALATE	1.23	1	ug/L	525.2	123	70-130			
	DIAZINON	1	1	ug/L	525.2	100	70-130			
	DIBENZO(A,H)ANTHRACENE	0.96	1	ug/L	525.2	96	70-130			
	DIELDRIN	0.99	1	ug/L	525.2	99	70-130			
	DIETHYL PHTHALATE	1.1	1	ug/L	525.2	110	70-130			
	DIMETHYL PHTHALATE	1.06	1	ug/L	525.2	106	70-130			
	DI-N-BUTYL PHTHALATE	1.14	1	ug/L	525.2	114	70-130			
	ENDRIN	0.96	1	ug/L	525.2	96	70-130			
	EPTC	0.96	1	ug/L	525.2	96	70-130			
	FLUORENE	1.04	1	ug/L	525.2	104	70-130			
	HEPTACHLOR	0.96	1	ug/L	525.2	96	70-130			
	HEPTACHLOR EPOXIDE	0.94	1	ug/L	525.2	94	70-130			
	HEXACHLOROBENZENE	0.97	1	ug/L	525.2	97	70-130			
	HEXACHLOROCYCLO-PENTADIENE	0.92	1	ug/L	525.2	92	70-130			
	INDENO(1,2,3-CD)PYRENE	0.95	1	ug/L	525.2	95	70-130			
	LINDANE (BHC - GAMMA)	0.97	1	ug/L	525.2	97	70-130			
	MALATHION	1.01	1	ug/L	525.2	101	70-130			
	METHOXYCHLOR	1.08	1	ug/L	525.2	108	70-130			
	METOLACHLOR	1.06	1	ug/L	525.2	106	70-130			
	METRIBUZIN	0.81	1	ug/L	525.2	81	70-130			
	PARATHION	0.83	1	ug/L	525.2	83	70-130			
	PENTACHLOROPHENOL	4.87	4	ug/L	525.2	122	70-130			
	PERYLENE-D12 (Surr)	101		%	525.2		70-130			
	PHENANTHRENE	1	1	ug/L	525.2	100	70-130			
	PROPACHLOR	1.02	1	ug/L	525.2	102	70-130			
	PYRENE	1	1	ug/L	525.2	100	70-130			
	PYRENE-D10 (Surr)	94		%	525.2		70-130			

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525_080609	SIMAZINE	0.96	1	ug/L	525.2	96	70-130		LFB	
	TERBACIL	0.99	1	ug/L	525.2	99	70-130			
	TRIFLURALIN	0.91	1	ug/L	525.2	91	70-130			
	TRIPHENYLPHOSPHATE (Surr)	100		%	525.2		70-130			
525X_080609	1-NAPHTHALENEACETAMIDE	2.37	2	ug/L	525.2	119	70-130		LFB	
	CHLORPYRIFOS	0.84	1	ug/L	525.2	84	70-130			
	DICOFOL	2.09	2	ug/L	525.2	105	70-130			
	FENARIMOL	0.9	1	ug/L	525.2	90	70-130			
	HEXAZINONE	1.2	1	ug/L	525.2	120	70-130			
	METALAXYL	2.01	2	ug/L	525.2	101	70-130			
	METHIDATHINON	2.18	2	ug/L	525.2	109	85-115			
	MEVINPHOS	0.99	1	ug/L	525.2	99	70-130			
	MYCLOBUTANIL	2.54	2	ug/L	525.2	127	85-115			
	NAPROPAMIDE	0.59	1	ug/L	525.2	59	70-130			
	PHOSMET	2.04	2	ug/L	525.2	102	70-130			
	PROPARGITE	2.16	2	ug/L	525.2	108	85-115			
	TRIADIMEFON	0.73	1	ug/L	525.2	73	70-130			
	TRIFLUMIZOLE	1.68	2	ug/L	525.2	84	85-115			
531_080611	3-HYDROXYCARBOFURAN	9.3	10	ug/L	531.2	93	70-130		LFB	
	ALDICARB	8.5	10	ug/L	531.2	85	70-130			
	ALDICARB SULFONE	8.8	10	ug/L	531.2	88	70-130			
	ALDICARB SULFOXIDE	8.3	10	ug/L	531.2	83	70-130			
	CARBARYL	9.3	10	ug/L	531.2	93	70-130			
	CARBOFURAN	9.4	10	ug/L	531.2	94	70-130			
	METHIOCARB	9.1	10	ug/L	531.2	91	70-130			
	METHOMYL	10	10	ug/L	531.2	100	70-130			
	OXYMAL	9.3	10	ug/L	531.2	93	70-130			
	PROPOXUR (BAYGON)	9.5	10	ug/L	531.2	95	70-130			
531_080611	3-HYDROXYCARBOFURAN	20	20	ug/L	531.2	100	70-130		LFB	
	ALDICARB	19	20	ug/L	531.2	95	70-130			
	ALDICARB SULFONE	19	20	ug/L	531.2	95	70-130			
	ALDICARB SULFOXIDE	18	20	ug/L	531.2	90	70-130			

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_080611	CARBARYL	19.5	20	ug/L	531.2	98	70-130		LFB	
	CARBOFURAN	20	20	ug/L	531.2	100	70-130			
	METHIOCARB	19	20	ug/L	531.2	95	70-130			
	METHOMYL	21	20	ug/L	531.2	105	70-130			
	OXYMAL	19.5	20	ug/L	531.2	98	70-130			
	PROPOXUR (BAYGON)	20	20	ug/L	531.2	100	70-130			
531_080611	3-HYDROXYCARBOFURAN	1	1	ug/L	531.2	100	70-130		LFB	
	ALDICARB	0.6	1	ug/L	531.2	60	70-130			Limits 50-150% at PQL
	ALDICARB SULFONE	0.75	1	ug/L	531.2	75	70-130			
	ALDICARB SULFOXIDE	1	1	ug/L	531.2	100	70-130			
	CARBARYL	0.9	1	ug/L	531.2	90	70-130			
	CARBOFURAN	1	1	ug/L	531.2	100	70-130			
	METHIOCARB	1	1	ug/L	531.2	100	70-130			
	METHOMYL	0.8	1	ug/L	531.2	80	70-130			
	OXYMAL	1	1	ug/L	531.2	100	70-130			
	PROPOXUR (BAYGON)	1	1	ug/L	531.2	100	70-130			
549_080603	PARAQUAT	14.1	20	ug/L	549.2	71	70-130		LFB	
COD_080604	CHEMICAL OXYGEN DEMAND	51	50	mg/L	SM5220 D	102	80-120		LFB	
OPHOS-080528	ORTHO-PHOSPHATE	1.02	1.00	mg/L	SM4500-P F	102	70-130		LFB	
tds_080602	TOTAL DISSOLVED SOLIDS	500	500	mg/L	SM2540 C	100	80-120		LFB	
tds_080602	TOTAL DISSOLVED SOLIDS	488	500	mg/L	SM2540 C	98	80-120		LFB	
tds_080602	TOTAL DISSOLVED SOLIDS	523	500	mg/L	SM2540 C	105	80-120		LFB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Reagent Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	QC Limits	Qualifier	Type*	Comment
200.7-080530A	HARDNESS	ND		mg/L	200.7		10.0000(		LRB	
317_080606A	BROMATE	ND		ug/L	317.0		0.00000		LRB	
317_080611A	BROMATE	ND		ug/L	317.0		0.00000		LRB	
317_080612A	BROMATE	ND		ug/L	317.0		0.00000		LRB	
COD_080604	CHEMICAL OXYGEN DEMAND	ND		mg/L	SM5220 D		4.00000		LRB	
I080528A	CHLORIDE	ND		mg/L	300.0		0.10000		LRB	
OPHOS-080528	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		LRB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
200.7-080530A	HARDNESS	ND		mg/L	200.7		0.82000		MB	
508_080609	AROCLOR 1016	ND		ug/L	508.1		0.02000		MB	
	AROCLOR 1221	ND		ug/L	508.1		0.12000			
	AROCLOR 1232	ND		ug/L	508.1		0.02000			
	AROCLOR 1242	ND		ug/L	508.1		0.02000			
	AROCLOR 1248	ND		ug/L	508.1		0.02000			
	AROCLOR 1254	ND		ug/L	508.1		0.02000			
	AROCLOR 1260	ND		ug/L	508.1		0.02000			
	TETRACHLORO-M-XYLENE (SURR)	86		%	508.1		0.00000			
515_080602	2,4 - D	ND		ug/L	515.1		0.05000		MB	
	2,4 - DCAA (SURR)	110		%	515.1					
	2,4 DB	ND		ug/L	515.1		0.25000			
	2,4,5 - TP (SILVEX)	ND		ug/L	515.1		0.10000			
	2,4,5 T	ND		ug/L	515.1		0.10000			
	ACIFLUORFEN	ND		ug/L	515.1		0.50000			
	BENTAZON	ND		ug/L	515.1		0.12000			
	CHLORAMBEN	ND		ug/L	515.1		0.20000			
	DALAPON	ND		ug/L	515.1		0.50000			
	DCPA (ACID METABOLITES)	ND		ug/L	515.1		0.10000			
	DICAMBA	ND		ug/L	515.1		0.05000			
	DICHLORPROP	ND		ug/L	515.1		0.12000			
	DINOSEB	ND		ug/L	515.1		0.10000			
	PENTACHLOROPHENOL	ND		ug/L	515.1		0.02000			
	PICLORAM	ND		ug/L	515.1		0.05000			
	TOTAL (DCPA & Metabolites)	ND		ug/L	515.1		0.02000			
525_080609	1,3-DIMETHYL-2-NITROBENZENE (Surr)	97		%	525.2				MB	
	4,4-DDD	ND		ug/L	525.2		0.05000			
	4,4-DDE	ND		ug/L	525.2		0.05000			
	4,4-DDT	ND		ug/L	525.2		0.05000			
	ACENAPHTHENE	ND		ug/L	525.2		0.05000			

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Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525_080609	ALACHLOR	ND		ug/L	525.2		0.02000		MB	
	ALDRIN	ND		ug/L	525.2		0.05000			
	ANTHRACENE	ND		ug/L	525.2		0.05000			
	ATRAZINE	ND		ug/L	525.2		0.02000			
	BENZ(A)ANTHRACENE	ND		ug/L	525.2		0.02000			
	BENZO(A)PYRENE	ND		ug/L	525.2		0.02000			
	BENZO(B)FLUORANTHENE	ND		ug/L	525.2		0.05000			
	BENZO(G,H,I)PERYLENE	ND		ug/L	525.2		0.05000			
	BENZO(K)FLUORANTHENE	ND		ug/L	525.2		0.05000			
	BENZYL BUTYL PHTHALATE	ND		ug/L	525.2		0.60000			
	BROMACIL	ND		ug/L	525.2		0.05000			
	BUTACHLOR	ND		ug/L	525.2		0.10000			
	CHLORDANE, TECHNICAL	ND		ug/L	525.2		0.02000			
	CHRYSENE	ND		ug/L	525.2		0.05000			
	CYANAZINE	ND		ug/L	525.2		0.05000			
	DI(ETHYLHEXYL)-ADIPATE	ND		ug/L	525.2		0.02000			
	DI(ETHYLHEXYL)-PHTHALATE	0.13		ug/L	525.2		0.60000			
	DIAZINON	ND		ug/L	525.2		0.05000			
	DIBENZO(A,H)ANTHRACENE	ND		ug/L	525.2		0.05000			
	DIELDRIN	ND		ug/L	525.2		0.05000			
	DIETHYL PHTHALATE	ND		ug/L	525.2		0.60000			
	DIMETHYL PHTHALATE	ND		ug/L	525.2		0.60000			
	DI-N-BUTYL PHTHALATE	ND		ug/L	525.2		0.60000			
	ENDRIN	ND		ug/L	525.2		0.02000			
	EPTC	ND		ug/L	525.2		0.07000			
	FLUORANTHENE	ND		ug/L	525.2		0.05000			
	FLUORENE	ND		ug/L	525.2		0.05000			
	HEPTACHLOR	ND		ug/L	525.2		0.02000			
	HEPTACHLOR EPOXIDE	ND		ug/L	525.2		0.02000			
	HEXACHLOROBENZENE	ND		ug/L	525.2		0.02000			
	HEXACHLOROCYCLO-PENTADIENE	ND		ug/L	525.2		0.02000			
	INDENO(1,2,3-CD)PYRENE	ND		ug/L	525.2		0.05000			
	LINDANE (BHC - GAMMA)	ND		ug/L	525.2		0.02000			
	MALATHION	ND		ug/L	525.2		0.05000			
	METHOXYCHLOR	ND		ug/L	525.2		0.02000			
	METOLACHLOR	ND		ug/L	525.2		0.25000			

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	QC Limits	Qualifier	Type*	Comment
525_080609	METRIBUZIN	ND		ug/L	525.2		0.05000		MB	
	NAPTHALENE	ND		ug/L	525.2		0.02000			
	PARATHION	ND		ug/L	525.2		0.05000			
	PENTACHLOROPHENOL	ND		ug/L	525.2		0.04000			
	PERYLENE-D12 (Surr)	95		%	525.2					
	PHENANTHRENE	ND		ug/L	525.2		0.05000			
	PROPACHLOR	ND		ug/L	525.2		0.05000			
	PYRENE	ND		ug/L	525.2		0.05000			
	PYRENE-D10 (Surr)	98		%	525.2					
	SIMAZINE	ND		ug/L	525.2		0.02000			
	TERBACIL	ND		ug/L	525.2		0.05000			
	TRIFLURALIN	ND		ug/L	525.2		0.05000			
	TRIPHENYLPHOSPHATE (Surr)	106		%	525.2					
525X_080609	1-NAPHTHALENEACETAMIDE	ND		ug/L	525.2		0.10000		MB	
	AZINPHOS-METHYL	ND		ug/L	525.2		0.00000			
	CHLORPYRIFOS	ND		ug/L	525.2		0.00000			
	DICOFOL	ND		ug/L	525.2		0.00000			
	DIMETHOATE	ND		ug/L	525.2		0.00000			
	FENARIMOL	ND		ug/L	525.2		0.00000			
	HEXAZINONE	ND		ug/L	525.2		0.00000			
	MALATHION	ND		ug/L	525.2		0.05000			
	METALAXYL	ND		ug/L	525.2		0.10000			
	METHIDATHINON	ND		ug/L	525.2		0.50000			
	METHYL PARATHION	ND		ug/L	525.2		0.00000			
	MEVINPHOS	ND		ug/L	525.2		0.00000			
	MYCLOBUTANIL	ND		ug/L	525.2		0.50000			
	NAPROPAMIDE	ND		ug/L	525.2		0.00000			
	PARATHION-ETHYL	ND		ug/L	525.2		0.05000			
	PHOSMET	ND		ug/L	525.2		0.10000			
	PROPARGITE	ND		ug/L	525.2		0.00000			
	TRIADIMEFON	ND		ug/L	525.2		0.00000			
	TRIFLUMIZOLE	ND		ug/L	525.2		1.00000			

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_080611	3-HYDROXYCARBOFURAN	ND		ug/L	531.2		0.50000		MB	
	ALDICARB	ND		ug/L	531.2		0.25000			
	ALDICARB SULFONE	ND		ug/L	531.2		0.40000			
	ALDICARB SULFOXIDE	ND		ug/L	531.2		0.25000			
	CARBARYL	ND		ug/L	531.2		0.50000			
	CARBOFURAN	ND		ug/L	531.2		0.45000			
	METHIOCARB	ND		ug/L	531.2		1.00000			
	METHOMYL	ND		ug/L	531.2		0.25000			
	OXYMAL	ND		ug/L	531.2		1.00000			
	PROPOXUR (BAYGON)	ND		ug/L	531.2		0.25000			
549_080603	PARAQUAT	ND		ug/L	549.2		0.50000		MB	
ec_080602	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080602	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080602	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080602	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080613	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080613	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080613	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
ec_080613	ELECTRICAL CONDUCTIVITY	ND		uS/cm	SM2510 B		2.50000		MB	
OPHOS-080528	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		MB	
tds_080602	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	
tds_080602	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	QC Limits	Qualifier	Type*	Comment
tds_080602	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	
turb_080528	TURBIDITY	ND		NTU	180.1		0.02000		MB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
200.7-080530A	HARDNESS	129	132.3	mg/L	200.7	98	80-120		QCS	
317_080606A	BROMATE	38.2	40.8	ug/L	317.0	94	70-130		QCS	
317_080611A	BROMATE	37.8	40.8	ug/L	317.0	93	70-130		QCS	
317_080612A	BROMATE	39	40.8	ug/L	317.0	96	70-130		QCS	
531_080611	3-HYDROXYCARBOFURAN	36.7	34.2	ug/L	531.2	107	70-130		QCS	
	ALDICARB	27.4	26	ug/L	531.2	105	70-130			
	ALDICARB SULFONE	33.8	30	ug/L	531.2	113	70-130			
	ALDICARB SULFOXIDE	18.5	16.6	ug/L	531.2	111	70-130			
	CARBARYL	32.4	30	ug/L	531.2	108	70-130			
	CARBOFURAN	104	100	ug/L	531.2	104	70-130			
	METHIOCARB	65.6	90.1	ug/L	531.2	73	70-130			
	METHOMYL	60	60.1	ug/L	531.2	100	70-130			
	OXYMAL	46.7	44.2	ug/L	531.2	106	70-130			
	PROPOXUR (BAYGON)	83.9	80.3	ug/L	531.2	104	70-130			
549_080603	PARAQUAT	3.2	4.8	ug/L	549.2	67	70-130		QCS	
COD_080604	CHEMICAL OXYGEN DEMAND	138	133	mg/L	SM5220 D	104	80-120		QCS	
ec_080602	ELECTRICAL CONDUCTIVITY	175	169	uS/cm	SM2510 B	104	80-120		QCS	
ec_080602	ELECTRICAL CONDUCTIVITY	175	169	uS/cm	SM2510 B	104	80-120		QCS	
ec_080602	ELECTRICAL CONDUCTIVITY	173	169	uS/cm	SM2510 B	102	80-120		QCS	
ec_080602	ELECTRICAL CONDUCTIVITY	172	169	uS/cm	SM2510 B	102	80-120		QCS	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: 08-07095
Report Date: 07/09/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
ec_080613	ELECTRICAL CONDUCTIVITY	168	169	uS/cm	SM2510 B	99	80-120		QCS	
ec_080613	ELECTRICAL CONDUCTIVITY	168	169	uS/cm	SM2510 B	99	80-120		QCS	
ec_080613	ELECTRICAL CONDUCTIVITY	168	169	uS/cm	SM2510 B	99	80-120		QCS	
ec_080613	ELECTRICAL CONDUCTIVITY	168	169	uS/cm	SM2510 B	99	80-120		QCS	
I080528A	CHLORIDE	29.1	30.0	mg/L	300.0	97	80-120		QCS	
OPHOS-080528	ORTHO-PHOSPHATE	0.50	0.49	mg/L	SM4500-P F	102	70-130		QCS	
ph_080528	HYDROGEN ION (pH)	8.09	8.00	pH Units	SM4500-H+ B	101	80-120		QCS	
	HYDROGEN ION (pH)	8.20	8.00	pH Units	SM4500-H+ B	103	80-120			
ph_080528	HYDROGEN ION (pH)	8.19	8.00	pH Units	SM4500-H+ B	102	80-120		QCS	
turb_080528	TURBIDITY	1.00	1.00	NTU	180.1	100	70-130		QCS	

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QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 08-07095
Report Date: 7/9/2008

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
200.7-080530A									
	15125	HARDNESS	156	156	mg CaCO3/L	0.0	0-45		DUP
	15169	HARDNESS	79.8	81.1	mg CaCO3/L	1.6	0-45		DUP
317_080606A									
317_080611A									
317_080612A									
	15036	BROMATE	6.5	6.7	ug/L	3.0	0-50		DUP
515_080602									
525_080609									
	15132	1,3-DIMETHYL-2-NITROBENZENE (Surr	98	96	%	2.1	0-45		DUP
	15132	PYRENE-D10 (Surr)	96	96	%	0.0	0-45		DUP
	15132	PERYLENE-D12 (Surr)	103	102	%	1.0	0-45		DUP
	15132	TRIPHENYLPHOSPHATE (Surr)	108	112	%	3.6	0-45		DUP
	15132	1,3-DIMETHYL-2-NITROBENZENE (Surr	98	96	%	2.1	0-45		DUP
	15132	PYRENE-D10 (Surr)	96	96	%	0.0	0-45		DUP
	15132	PERYLENE-D12 (Surr)	103	102	%	1.0	0-45		DUP
	15132	TRIPHENYLPHOSPHATE (Surr)	108	112	%	3.6	0-45		DUP
525X_080609									
	15132	BISPHENOL-A	0.6	0.6	ug/L	0.0	0-20		DUP
COD_080604									
	15260	CHEMICAL OXYGEN DEMAND	8900	8850	mg/L	0.6	0-45		DUP
EC_080602									
	15127	ELECTRICAL CONDUCTIVITY	129	129	uS/cm	0.0	0-45		DUP
	15147	ELECTRICAL CONDUCTIVITY	400	403	uS/cm	0.7	0-45		DUP
	15483	ELECTRICAL CONDUCTIVITY	732	732	uS/cm	0.0	0-45		DUP
EC_080613									
	16628	ELECTRICAL CONDUCTIVITY	301	301	uS/cm	0.0	0-45		DUP

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
	16978	ELECTRICAL CONDUCTIVITY	237	237	uS/cm	0.0	0-45	DUP	
	17042	ELECTRICAL CONDUCTIVITY	744	743	uS/cm	0.1	0-45	DUP	
I080528A									
	15147	CHLORIDE	31	31	mg/L	0.0	0-45	DUP	
	15169	CHLORIDE	26	26	mg/L	0.0	0-45	DUP	
NO3NO2-080528									
	15050	NITRATE-N	0.54	0.54	mg/L	0.0	0-20	DUP	
	15060	NITRATE-N	0.04	0.04	mg/L	0.0	0-20	DUP	
	15133	NITRATE-N	1.11	1.10	mg/L	0.9	0-20	DUP	
OPHOS-080528									
	15060	ORTHO-PHOSPHATE	0.32	0.33	mg/L	3.1	0-50	DUP	
	15128	ORTHO-PHOSPHATE	0.12	0.12	mg/L	0.0	0-50	DUP	
	15133	ORTHO-PHOSPHATE	0.23	0.23	mg/L	0.0	0-50	DUP	
PH_080528									
	15131	HYDROGEN ION (pH)	6.75	6.70	pH Units	0.7	0-45	DUP	
	15169	HYDROGEN ION (pH)	8.10	8.08	pH Units	0.2	0-45	DUP	
TDS_080602									
	15133	TOTAL DISSOLVED SOLIDS	120	117	mg/L	2.5	0-45	DUP	
	15509	TOTAL DISSOLVED SOLIDS	50	53	mg/L	5.8	0-45	DUP	
TURB_080528									
	15133	TURBIDITY	8.45	8.22	NTU	2.8	0-50	DUP	
	15147	TURBIDITY	4.74	5.15	NTU	8.3	0-50	DUP	

%RPD = Relative Percent Difference

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Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
200.7-080530A														
	15125	HARDNESS	156	220	221	69.5	mg CaCO3/L	**92**	**94**	80-120	**1.6**	0-60		LFM
	15169	HARDNESS	79.8	146	146	69.5	mg CaCO3/L	**95**	**95**	80-120	**0.0**	0-60		LFM
317_080606A														
	14879	BROMATE	ND	9.3		10.0	ug/L	**93**	**NA**	70-130	**NA**	0-50		LFM
317_080611A														
	15130	BROMATE	ND	7.6		10	ug/L	**76**	**NA**	70-130	**NA**	0-50		LFM
317_080612A														
	15036	BROMATE	6.5	18		10	ug/L	**115**	**NA**	70-130	**NA**	0-50		LFM
	15512	BROMATE	ND	10.9		10	ug/L	**109**	**NA**	70-130	**NA**	0-50		LFM
515_080602														
	14221	2,4 - D	ND	2.16		2	ug/L	**108**	**NA**	65-135	**NA**	0-60		LFM
	14221	2,4,5 - TP (SILVEX)	ND	1.19		1	ug/L	**119**	**NA**	65-135	**NA**	0-60		LFM
	14221	PENTACHLOROPHENOL	ND	1.06		1	ug/L	**106**	**NA**	65-135	**NA**	0-60		LFM
	14221	DALAPON	ND	12.1		13	ug/L	**93**	**NA**	65-135	**NA**	0-60		LFM
	14221	DINOSEB	ND	2.81		2	ug/L	**141**	**NA**	65-135	**NA**	0-60	AH	LFM
	14221	PICLORAM	ND	0.96		1	ug/L	**96**	**NA**	65-135	**NA**	0-60		LFM
	14221	DICAMBA	ND	1.05		1	ug/L	**105**	**NA**	65-135	**NA**	0-60		LFM
	14221	TOTAL (DCPA & Metabolites)	ND	1.19		1	ug/L	**119**	**NA**	65-135	**NA**	0-60		LFM
	14221	2,4 DB	ND	10.6		8	ug/L	**133**	**NA**	65-135	**NA**	0-60		LFM
	14221	2,4,5 T	ND	1.06		1	ug/L	**106**	**NA**	65-135	**NA**	0-60		LFM
	14221	BENTAZON	ND	2.26		2	ug/L	**113**	**NA**	65-135	**NA**	0-60		LFM
	14221	DICHLORPROP	ND	2.89		3	ug/L	**96**	**NA**	65-135	**NA**	0-60		LFM
	14221	ACIFLUORFEN	ND	1.29		1	ug/L	**129**	**NA**	65-135	**NA**	0-60		LFM
	14221	CHLORAMBEN	ND	0.76		1	ug/L	**76**	**NA**	65-135	**NA**	0-50		LFM
	14221	2,4 - DCAA (SURR)	108	116			%		**NA**	70-130	**NA**	0-60		LFM
525_080609														
	15133	ENDRIN	ND	0.99		1	ug/L	**99**	**NA**	70-130	**NA**	0-60		LFM
	15133	LINDANE (BHC - GAMMA)	ND	1		1	ug/L	**100**	**NA**	70-130	**NA**	0-60		LFM
	15133	METHOXYCHLOR	ND	1.14		1	ug/L	**114**	**NA**	70-130	**NA**	0-60		LFM
	15133	ALACHLOR	ND	2.08		2	ug/L	**104**	**NA**	70-130	**NA**	0-60		LFM
	15133	ATRAZINE	ND	2.25		2	ug/L	**113**	**NA**	70-130	**NA**	0-60		LFM
	15133	BENZO(A)PYRENE	ND	0.75		1	ug/L	**75**	**NA**	70-130	**NA**	0-60		LFM
	15133	CHLORDANE, TECHNICAL	ND	1.02		1	ug/L	**102**	**NA**	70-130	**NA**	0-60		LFM
	15133	DI(ETHYLHEXYL)-ADIPATE	ND	1.09		1	ug/L	**109**	**NA**	70-130	**NA**	0-60		LFM

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier		Comments
	15133	DI(ETHYLHEXYL)-PHTHALATE	ND	1.33		1	ug/L	133	NA	70-130	NA	0-60	BQ	LFM	
	15133	HEPTACHLOR	ND	1.02		1	ug/L	102	NA	70-130	NA	0-60		LFM	
	15133	HEPTACHLOR EPOXIDE	ND	0.98		1	ug/L	98	NA	70-130	NA	0-50		LFM	
	15133	HEXACHLOROBENZENE	ND	1.05		1	ug/L	105	NA	70-130	NA	0-60		LFM	
	15133	HEXACHLOROCYCLO-PENTADIENE	ND	1.1		1	ug/L	110	NA	70-130	NA	0-60		LFM	
	15133	SIMAZINE	ND	1.02		1	ug/L	102	NA	70-130	NA	0-60		LFM	
	15133	PENTACHLOROPHENOL	ND	5.3		4	ug/L	133	NA	70-130	NA	0-50		LFM	
	15133	ALDRIN	ND	0.96		1	ug/L	96	NA	70-130	NA	0-60		LFM	
	15133	BUTACHLOR	ND	1.08		1	ug/L	108	NA	70-130	NA	0-60		LFM	
	15133	DIELDRIN	ND	1.02		1	ug/L	102	NA	70-130	NA	0-60		LFM	
	15133	METOLACHLOR	ND	1.06		1	ug/L	106	NA	70-130	NA	0-60		LFM	
	15133	METRIBUZIN	ND	0.93		1	ug/L	93	NA	70-130	NA	0-60		LFM	
	15133	PROPACHLOR	ND	1.11		1	ug/L	111	NA	70-130	NA	0-60		LFM	
	15133	BROMACIL	ND	1.12		1	ug/L	112	NA	70-130	NA	0-60		LFM	
	15133	TERBACIL	ND	1.1		1	ug/L	110	NA	70-130	NA	0-60		LFM	
	15133	DIAZINON	ND	1.07		1	ug/L	107	NA	70-130	NA	0-60		LFM	
	15133	SIMAZINE	ND	1.02		1	ug/L	102	NA	70-130	NA	0-60		LFM	
	15133	EPTC	ND	1.01		1	ug/L	101	NA	70-130	NA	0-60		LFM	
	15133	DIAZINON	ND	1.07		1	ug/L	107	NA	70-130	NA	0-60		LFM	
	15133	4,4-DDD	ND	1.06		1	ug/L	106	NA	70-130	NA	0-60		LFM	
	15133	4,4-DDE	ND	1.04		1	ug/L	104	NA	70-130	NA	0-60		LFM	
	15133	LINDANE (BHC - GAMMA)	ND	1		1	ug/L	100	NA	70-130	NA	0-60		LFM	
	15133	4,4-DDT	ND	1.08		1	ug/L	108	NA	70-130	NA	0-60		LFM	
	15133	CYANAZINE	ND	0.89		1	ug/L	89	NA	70-130	NA	0-60		LFM	
	15133	MALATHION	ND	1.1		1	ug/L	110	NA	70-130	NA	0-60		LFM	
	15133	PARATHION	ND	0.98		1	ug/L	98	NA	70-130	NA	0-60		LFM	
	15133	TRIFLURALIN	ND	1.06		1	ug/L	106	NA	70-130	NA	0-60		LFM	
	15133	4,4-DDD	ND	1.06		1	ug/L	106	NA	70-130	NA	0-60		LFM	
	15133	4,4-DDE	ND	1.04		1	ug/L	104	NA	70-130	NA	0-60		LFM	
	15133	4,4-DDT	ND	1.08		1	ug/L	108	NA	70-130	NA	0-60		LFM	
	15133	MALATHION	ND	1.1		1	ug/L	110	NA	70-130	NA	0-60		LFM	
	15133	PARATHION-ETHYL	ND	0.98		1	ug/L	98	NA	70-130	NA	0-60		LFM	
	15133	FLUORENE	ND	1.11		1	ug/L	111	NA	70-130	NA	0-60		LFM	
	15133	ACENAPHTHYLENE	ND	1.02		1	ug/L	102	NA	70-130	NA	0-60		LFM	
	15133	ANTHRACENE	ND	0.48		1	ug/L	48	NA	70-130	NA	0-60	CC	LFM	
	15133	BENZ(A)ANTHRACENE	ND	0.91		1	ug/L	91	NA	70-130	NA	0-60		LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

ANALYTICAL LABORATORIES

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
	15133	BENZO(B)FLUORANTHENE	ND	0.96		1	ug/L	96	NA	70-130	NA	0-60		LFM
	15133	BENZO(G,H,I)PERYLENE	ND	1		1	ug/L	100	NA	70-130	NA	0-60		LFM
	15133	BENZO(K)FLUORANTHENE	ND	1.02		1	ug/L	102	NA	70-130	NA	0-60		LFM
	15133	CHRYSENE	ND	1.07		1	ug/L	107	NA	70-130	NA	0-60		LFM
	15133	DIBENZO(A,H)ANTHRACENE	ND	1.01		1	ug/L	101	NA	70-130	NA	0-60		LFM
	15133	INDENO(1,2,3-CD)PYRENE	ND	1.04		1	ug/L	104	NA	70-130	NA	0-60		LFM
	15133	PHENANTHRENE	ND	1.04		1	ug/L	104	NA	70-130	NA	0-60		LFM
	15133	PYRENE	ND	1.04		1	ug/L	104	NA	70-130	NA	0-60		LFM
	15133	BENZYL BUTYL PHTHALATE	ND	1.11		1	ug/L	111	NA	70-130	NA	0-60		LFM
	15133	DI-N-BUTYL PHTHALATE	ND	1.23		1	ug/L	123	NA	70-130	NA	0-60		LFM
	15133	DIETHYL PHTHALATE	ND	1.2		1	ug/L	120	NA	70-130	NA	0-60		LFM
	15133	DIMETHYL PHTHALATE	ND	1.1		1	ug/L	110	NA	70-130	NA	0-60		LFM
	15133	1,3-DIMETHYL-2-NITROBENZENE (Surr	98	98			%		NA	70-130	NA	0-60		LFM
	15133	PYRENE-D10 (Surr)	95	94			%		NA	70-130	NA	0-60		LFM
	15133	PERYLENE-D12 (Surr)	102	99			%		NA	70-130	NA	0-60		LFM
	15133	TRIPHENYLPHOSPHATE (Surr)	108	102			%		NA	70-130	NA	0-60		LFM
525X_080609														
	15133	PROPARGITE	ND	2.3		2	ug/L	115	NA	70-130	NA	0-50		LFM
	15133	METALAXYL	ND	2.06		2	ug/L	103	NA	70-130	NA	0-50		LFM
	15133	NAPROPAMIDE	ND	0.61		1	ug/L	61	NA	70-130	NA	0-50		LFM
	15133	1-NAPHTHALENEACETAMIDE	ND	2.64		2	ug/L	132	NA	70-130	NA	0-50		LFM
	15133	FENARIMOL	ND	0.99		1	ug/L	99	NA	70-130	NA	0-50		LFM
	15133	MEVINPHOS	ND	1.08		2	ug/L	54	NA	70-130	NA	0-50		LFM
	15133	CHLORPYRIFOS	ND	0.94		1	ug/L	94	NA	70-130	NA	0-50		LFM
	15133	DICOFOL	ND	2.24		2	ug/L	112	NA	70-130	NA	0-50		LFM
	15133	PHOSMET	ND	2.26		2	ug/L	113	NA	70-130	NA	0-50		LFM
	15133	TRIADIMEFON	ND	0.8		1	ug/L	80	NA	70-130	NA	0-50		LFM
	15133	TRIFLUMIZOLE	ND	1.81		2	ug/L	91	NA	70-130	NA	0-50		LFM
	15133	METHIDATHINON	ND	2.32		2	ug/L	116	NA	70-130	NA	0-50		LFM
	15133	MYCLOBUTANIL	ND	2.65		2	ug/L	133	NA	70-130	NA	0-50		LFM
	15133	HEXAZINONE	ND	1.25		1	ug/L	125	NA	70-130	NA	0-50		LFM
531_080611														
	13899	OXYMAL	ND	8.7		10	ug/L	87	NA	70-130	NA	0-50		LFM
	13899	CARBOFURAN	ND	8.8		10	ug/L	88	NA	70-130	NA	0-50		LFM
	13899	ALDICARB SULFOXIDE	ND	7.8		10	ug/L	78	NA	70-130	NA	0-50		LFM
	13899	ALDICARB SULFONE	ND	8.5		10	ug/L	85	NA	70-130	NA	0-50		LFM

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Reference Number: 08-07095
Report Date: 7/9/2008

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
	13899	METHOMYL	ND	9.4		10	ug/L	94	NA	70-130	NA	0-50	LFM	
	13899	3-HYDROXYCARBOFURAN	ND	8.9		10	ug/L	89	NA	70-130	NA	0-50	LFM	
	13899	ALDICARB	ND	8		10	ug/L	80	NA	70-130	NA	0-50	LFM	
	13899	CARBARYL	ND	8.8		10	ug/L	88	NA	70-130	NA	0-50	LFM	
	13899	PROPOXUR (BAYGON)	ND	9		10	ug/L	90	NA	70-130	NA	0-50	LFM	
	13899	METHIOCARB	ND	8.1		10	ug/L	81	NA	70-130	NA	0-50	LFM	
	15128	OXYMAL	ND	8.5	7.6	10	ug/L	85	76	70-130	11.2	0-50	LFM	
	15128	CARBOFURAN	ND	8.8	7.9	10	ug/L	88	79	70-130	10.8	0-50	LFM	
	15128	ALDICARB SULFOXIDE	ND	7.8	7	10	ug/L	78	70	70-130	10.8	0-50	LFM	
	15128	ALDICARB SULFONE	ND	8.7	7.2	10	ug/L	87	72	70-130	18.9	0-50	LFM	
	15128	METHOMYL	ND	8.8	8.2	10	ug/L	88	82	70-130	7.1	0-50	LFM	
	15128	3-HYDROXYCARBOFURAN	ND	9.6	8.6	10	ug/L	96	86	70-130	11.0	0-50	LFM	
	15128	ALDICARB	ND	8.3	7	10	ug/L	83	70	70-130	17.0	0-50	LFM	
	15128	CARBARYL	ND	8.8	7.6	10	ug/L	88	76	70-130	14.6	0-50	LFM	
	15128	PROPOXUR (BAYGON)	ND	9.3	7.9	10	ug/L	93	79	70-130	16.3	0-50	LFM	
	15128	METHIOCARB	ND	8.6	7.4	10	ug/L	86	74	70-130	15.0	0-50	LFM	
COD_080604														
	15131	CHEMICAL OXYGEN DEMAND	ND	57	57	50	mg/L	114	114	80-120	0.0	0-60	LFM	
	15260	CHEMICAL OXYGEN DEMAND	8900	11300	11300	2500	mg/L	96	96	80-120	0.0	0-60	LFM	
I080528A														
	15147	CHLORIDE	31	32		1.00	mg/L	100	NA	80-120	NA	0-60	LFM	
	15169	CHLORIDE	26	47		20.00	mg/L	105	NA	80-120	NA	0-60	LFM	
NO3NO2-080528														
	15050	NITRATE-N	0.54	1.56	1.54	1.00	mg/L	102	100	90-110	2.0	0-50	LFM	
	15060	NITRATE-N	0.04	1.07	1.05	1.00	mg/L	103	101	90-110	2.0	0-50	LFM	
	15061	NITRATE-N	0.56	1.59	1.56	1.00	mg/L	103	100	90-110	3.0	0-50	LFM	
	15133	NITRATE-N	1.11	2.11	2.09	1.00	mg/L	100	98	90-110	2.0	0-50	LFM	
OPHOS-080528														
	15050	ORTHO-PHOSPHATE	ND	1.09	1.06	1.00	mg/L	109	106	70-130	2.8	0-50	LFM	
	15060	ORTHO-PHOSPHATE	0.32	1.39	1.36	1.00	mg/L	107	104	70-130	2.8	0-50	LFM	
	15128	ORTHO-PHOSPHATE	0.12	1.17	1.16	1.00	mg/L	105	104	70-130	1.0	0-50	LFM	
	15133	ORTHO-PHOSPHATE	0.23	1.27	1.30	1.00	mg/L	104	107	70-130	2.8	0-50	LFM	

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EDGE ANALYTICAL LABORATORIES

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 08-07095
Report Date: 07/09/08

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
515_080602						
15124	2,4 - DCAA (SURR)	108		%	515.1	Acceptance Range is 70 - 130%
508_080609						
15124	TETRACHLORO-M-XYLENE (SURR)	86		%	508.1	Acceptance Limits 70%-130%
525_080609						
15124	1,3-DIMETHYL-2-NITROBENZENE (Surr)	100		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	96		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	106		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	108		%		Acceptance Range is 70% to 130%
515_080602						
15125	2,4 - DCAA (SURR)	112		%	515.1	Acceptance Range is 70 - 130%
515_080602						
15126	2,4 - DCAA (SURR)	107		%	515.1	Acceptance Range is 70 - 130%
515_080602						
15127	2,4 - DCAA (SURR)	109		%	515.1	Acceptance Range is 70 - 130%
515_080602						
15128	2,4 - DCAA (SURR)	108		%	515.1	Acceptance Range is 70 - 130%
515_080602						
15129	2,4 - DCAA (SURR)	105		%	515.1	Acceptance Range is 70 - 130%
515_080602						
15130	2,4 - DCAA (SURR)	117		%	515.1	Acceptance Range is 70 - 130%
515_080602						
15131	2,4 - DCAA (SURR)	117		%	515.1	Acceptance Range is 70 - 130%
508_080609						
15131	TETRACHLORO-M-XYLENE (SURR)	80		%	508.1	Acceptance Limits 70%-130%
525_080609						
15131	1,3-DIMETHYL-2-NITROBENZENE (Surr)	99		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	93		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	103		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	110		%		Acceptance Range is 70% to 130%
515_080602						
15132	2,4 - DCAA (SURR)	107		%	515.1	Acceptance Range is 70 - 130%
508_080609						
15132	TETRACHLORO-M-XYLENE (SURR)	82		%	508.1	Acceptance Limits 70%-130%
525_080609						
15132	1,3-DIMETHYL-2-NITROBENZENE (Surr)	98		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	96		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	103		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	108		%		Acceptance Range is 70% to 130%
515_080602						
15133	2,4 - DCAA (SURR)	112		%	515.1	Acceptance Range is 70 - 130%
508_080609						
15133	TETRACHLORO-M-XYLENE (SURR)	80		%	508.1	Acceptance Limits 70%-130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 08-07095
Report Date: 07/09/08

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
525_080609						
15133	1,3-DIMETHYL-2-NITROBENZENE (Surr)	98		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	95		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	102		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	108		%		Acceptance Range is 70% to 130%

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

Qualifier Definitions

Reference Number: 08-07095
Report Date: 07/09/08

Qualifier	Definition
AH	Result was high for this analyte in the end standard, indicating an increase in detector response. No detection of this analyte was found in samples, therefore no further action taken.
BQ	Indicates that an analyte has been detected in the laboratory method blank. This flag denotes possible contribution of laboratory background.
CC	Continuing calibration check standard was within acceptance limits. Low recovery for a PAH may possibly be a result of photo-degradation.

Note: Some qualifier definitions found on this page may pertain to results or QC data which are not printed with this report.

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

5214

Report to:	Walla Walla Basin Watershed Cour	Bill to:	Walla Walla Basin Watershed Counc
Ship Address:	810 S Main Street	Address:	810 S Main Street
City:	Milton-Freewat St: OR Zip: 97862	City:	Milton-Freewate St: OR Zip: 97862
Attn:	Bob Bower	Phone:	FAX:
Phone:	541.938-2170 FAX:	P.O.#:	Attn:
Email:		☐ Visa ☐ M/C ☐ A/E	Expires /
Project	Locher / Hall Wetland / HBDIC	Card#:	

For Lab Use Only
Ref #

Check Regulatory Program
- ☐ Safe Drinking Water Act
- ☐ Clean Water Act
- ☐ RCRA / CERCLA
- ☒ Other

ANALYTICAL LABORATORIES
1620 S. Walnut St.
Burlington, WA 98233
1.800.755.9295

805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

Instructions
1. Use one line per sample.
2. Be specific in analysis requests.
3. Check off analyses to be performed for each sample.
4. Enter number of containers.

Turn Around Time Required
- ☒ Standard
- ☐ Half-time (50% surcharge)
- ☐ Quickest (100% surcharge)
- ☐ Other

Analyses Requested

CO005214

	Field ID	Location	Grab/ Comp.	Matrix	Date	Time	531	Bromate	Hardness	NO3, COD	SOC Package	TDS, Cl, O-Phos,pH,Turb,Ec	515		Number of Containers	Special Instructions Conditions on Receipt
1	HBDIC ORS 1	HBDIC	\	\	5/27/08	7:30	☒	☑	☑	☑	☒	☑	☒	☐	9	
2	L-1	Locher Rd				8:15	☑	☑	☑	☑	☐	☑	☒	☐	6	
3	L-2	Locher Rd				8:45	☒	☒	☒	☒	☐	☒	☒	☐	6	
4	L-3	Locher Rd				9:25	☑	☒	☒	☒	☐	☒	☒	☐	6	
5	L-Intake	Locher Rd				9:45	☒	☒	☒	☒	☐	☒	☒	☐	6	
6	L-S1	mud Creek				10:00	☒	☒	☒	☒	☐	☒	☒	☐	6	
7	L-S2	mud Creek				10:30	☒	☒	☒	☒	☐	☒	☒	☐	6	
8	HW #1	Hall Wetland				11:18	☒	☒	☒	☒	☒	☒	☒	☐	9	
9	HW #2	Hall Wetland				11:40	☒	☒	☒	☒	☒	☒	☒	☐	9	
10	HW #3	Hall Wetland			↓	10:45	☒	☒	☒	☒	☒	☒	☒	☐	9	
																Total Containers ✓

Sampled by: T. Baker Phone: (541) 938-2170 FAX: Email: tran.baker@wwbwc.org

Sample Receipt Request (Must include FAX or Email) ☐

08-07095
15124 - 15133

Relinquished by	Date	Time	Received by	Date	Time
			L. Kennaugh	5-28-08	

	Yes	No	N/A
Custody seals intact	☐	☐	☐
Sample temp 3 C satisfactory	☐	☐	☐
Samples received intact	☐	☐	
Chain of custody & labels agree	☐	☐	

C.O

525's NOT preserved with HCL - okay per

Appendices I-F

HBDIC Recharge Water Quality Testing:

Lab Results, Notes and Records

2008-2009 Recharge Season

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Microbiology | 360.671.0688 • 360.671.1577fax

July 14, 2009

Mr. Bob Bower
Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

RE: 09-07724 - HBDIC Recharge Project

Dear Mr. Bob Bower,

Your project: HBDIC Recharge Project, was received on Friday May 29, 2009.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

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Data Report

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Reference Number: **09-07724**
Project: HBDIC Recharge Project
Report Date: 7/14/09
Date Received: 5/29/09
Peer Review: JM

Sample Description: HBDIC OBS #1 - Observation Well #1 | Sample Date: 5/27/09
Lab Number: 16045 | Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
14797-55-8	**NITRATE-N**	0.12	0.100	0.015	mg/L	1	300.0	5/29/09	BJ	I090529A	
E-10173	**TOTAL DISSOLVED SOLIDS**	59	10		mg/L	1	SM2540 C	6/3/09	CCN	TDS_090603	
14265-44-2	**ORTHO-PHOSPHATE**	0.18	0.01	0.002	mg/L	1	SM4500-P F	5/29/09	SO	OPHOS-090529B	
16887-00-6	**CHLORIDE**	0.4	0.1	0.012	mg/L	1	300.0	5/29/09	BJ	I090529A	
E-10264	**TOTAL KJELDAHL NITROGEN**	0.34	0.30	0.0486	mg/L	1	SM4500-Norg C	6/3/09	SO	TKN-090603	
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.68	mg/L	1	SM2540 D	5/29/09	MAK	TSS_090529	
E-10195	**TOTAL ORGANIC CARBON**	1.14	0.50	0.07	mg/L	1	SM5310 B	6/2/09	BJ	TOC_090602	
E-10117	**CHEMICAL OXYGEN DEMAND**	ND	8.0	2.47	mg/L	1	SM5220 D	6/2/09	MAK	COD_090602	

Sample Description: HBDIC OBS #1 - Duplicated | Sample Date: 5/27/09
Lab Number: 16046 | Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
14797-55-8	**NITRATE-N**	0.13	0.100	0.015	mg/L	1	300.0	5/29/09	BJ	I090529A	
E-10173	**TOTAL DISSOLVED SOLIDS**	60	10		mg/L	1	SM2540 C	6/3/09	CCN	TDS_090603	
14265-44-2	**ORTHO-PHOSPHATE**	0.18	0.01	0.002	mg/L	1	SM4500-P F	5/29/09	SO	OPHOS-090529B	
16887-00-6	**CHLORIDE**	0.4	0.1	0.012	mg/L	1	300.0	5/29/09	BJ	I090529A	
E-10264	**TOTAL KJELDAHL NITROGEN**	0.38	0.30	0.0486	mg/L	1	SM4500-Norg C	6/3/09	SO	TKN-090603	
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.68	mg/L	1	SM2540 D	5/29/09	MAK	TSS_090529	
E-10195	**TOTAL ORGANIC CARBON**	1.18	0.50	0.07	mg/L	1	SM5310 B	6/2/09	BJ	TOC_090602	
E-10117	**CHEMICAL OXYGEN DEMAND**	ND	8.0	2.47	mg/L	1	SM5220 D	6/2/09	MAK	COD_090602	

Notes:
ND - Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Project::
Field ID: HBDIC OBS #1
Sample Description: Observation Well #1
Sampled By:
Sample Date: 5/27/09
Source Type:
Sampler Phone:

Reference Number: 09-07724
Project: HBDIC Recharge Project

Lab Number: 16045
Report Date: 6/4/09
Date Analyzed: 06/03/09
Date Extracted: 531_090603
Analyst: CO
Peer Review:
Analytical Method: 531.2
Carbamates

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.3	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.2	40	
EPA Unregulated							
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.3		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.3		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.3		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	0.3		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.3		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.2		
State Unregulated - Other							
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.4		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.3		

NOTE: If a compound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

If you have any questions concerning this report contact at the above phone number.

FORM: SOC_gen.rpt

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Project::
Field ID: HBDIC OBS #1
Sample Description: Duplicated
Sampled By:
Sample Date: 5/27/09
Source Type:
Sampler Phone:

Reference Number: 09-07724
Project: HBDIC Recharge Project

Lab Number: 16046
Report Date: 6/4/09
Date Analyzed: 06/03/09
Date Extracted: 531_090603
Analyst: CO
Peer Review:
Analytical Method: 531.2
Carbamates

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.3	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.2	40	
EPA Unregulated							
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.3		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.3		
16752-77-5	METHOMYL	**ND**	ug/L	1.0	0.3		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	0.3		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.3		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.2		
State Unregulated - Other							
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.4		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.3		

NOTE:
If [illegible]und is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

If you have any questions concerning this report contact at the above phone number.

FORM: SOC_gen.rpt

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Project::
Field ID: HBDIC OBS #1
Sample Description: Observation Well #1
Sampled By:
Sample Date: 5/27/09
Source Type:
Sampler Phone:

Reference Number: 09-07724
Project: HBDIC Recharge Project

Lab Number: 16045
Report Date: 6/10/09
Date Analyzed: 06/04/09
Date Extracted: 515.4_090603
Analyst: CQ
Peer Review:
Analytical Method: 515.4
Herbicides in Drinking Water

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
94-75-7	2,4 - D	ND	ug/L	0.5	0.2	70	
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L	0.25	0.04	50	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.25	0.05	1	
7 0	DALAPON	ND	ug/L	3.25	0.9	200	
88-85-7	DINOSEB	ND	ug/L	0.5	0.2	7	
1918-02-1	PICLORAM	ND	ug/L	0.25	0.07	500	
Other							
E-14028	DCPA (ACID METABOLITES)	ND	ug/L	0.25	0.1		
1918-00-9	DICAMBA	ND	ug/L	0.25	0.05		
94-82-6	2,4 DB	ND	ug/L	2	2		
93-76-5	2,4,5 T	ND	ug/L	0.25	0.04		
25057-89-0	BENTAZON	ND	ug/L	0.5	0.2		
120-36-5	DICHLORPROP	ND	ug/L	0.75	0.5		
50594-66-6	ACIFLUORFEN	ND	ug/L	0.25	0.1		
133-90-4	CHLORAMBEN	ND	ug/L		0.3		qualitiative analysis
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.25	0.2		

NOTES:
If [illegible]ound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
M[illegible]aximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

If you have any questions concerning this report contact at the above phone number.

FORM: SOC_gen.rpt

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HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Project::
Field ID: HBDIC OBS #1
Sample Description: Duplicated
Sampled By:
Sample Date: 5/27/09
Source Type:
Sampler Phone:

Reference Number: 09-07724
Project: HBDIC Recharge Project

Lab Number: 16046
Report Date: 6/10/09
Date Analyzed: 06/04/09
Date Extracted: 515.4_090603
Analyst: CO
Peer Review: pm
Analytical Method: 515.4
Herbicides in Drinking Water

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
94-75-7	2,4 - D	ND	ug/L	0.5	0.2	70	
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L	0.25	0.04	50	
87-86-5	PENTACHLOROPHENOL	ND	ug/L	0.25	0.05	1	
7[illegible]-0	DALAPON	ND	ug/L	3.25	0.9	200	
88-85-7	DINOSEB	ND	ug/L	0.5	0.2	7	
1918-02-1	PICLORAM	ND	ug/L	0.25	0.07	500	
Other							
E-14028	DCPA (ACID METABOLITES)	ND	ug/L	0.25	0.1		
1918-00-9	DICAMBA	ND	ug/L	0.25	0.05		
94-82-6	2,4 DB	ND	ug/L	2	2		
93-76-5	2,4,5 T	ND	ug/L	0.25	0.04		
25057-89-0	BENTAZON	ND	ug/L	0.5	0.2		
120-36-5	DICHLORPROP	ND	ug/L	0.75	0.5		
50594-66-6	ACIFLUORFEN	ND	ug/L	0.25	0.1		
133-90-4	CHLORAMBEN	ND	ug/L		0.3		qualitiative analysis
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.25	0.2		

NOTES:
If [illegible]ound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
M[illegible]ximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A bla[illegible]CL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

If you have any questions concerning this report contact at the above phone number.

FORM: SOC_gen.rpt

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WSDOE Lab C1251

DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Reference Number: **09-07724**
Project: HBDIC Recharge Project

Lab Number: 16045
Field ID: HBDIC OBS #1
Sample Description: Observation Well #1
Matrix: Water
Sample Date: 5/27/09
Extraction Date: 6/9/09
Extraction Method: 3535

Report Date: 7/14/09
Date Analyzed: 7/6/09
Analyst: CO
Peer Review:
Analytical Method: 525.2
Batch: 525X_090609

CAS	Compound	RESULT	Flag	UNITS	PQL	MDL	D.F.	COMMENT
80-05-7	BISPHENOL-A	3.2		ug/L	1		1.00	
60-51-5	DIMETHOATE	ND		ug/L	0.5	0.03	1.00	
37-19-	METALAXYL	ND		ug/L	0.1	-	1.00	
15299-99-	NAPROPAMIDE	ND		ug/L	0.1	0.05	1.00	
122-34-9	SIMAZINE	ND		ug/L	0.1	0.03	1.00	
86-86-2	1-NAPHTHALENEACETAMIDE	ND		ug/L	0.5	-	1.00	
333-41-5	DIAZINON	ND		ug/L	0.1	0.04	1.00	
60168-88-	FENARIMOL	ND		ug/L	0.1	0.03	1.00	
58-89-9	LINDANE (BHC - GAMMA)	ND		ug/L	0.1	0.03	1.00	
7786-34-7	MEVINPHOS	ND		ug/l	0.1	0.03	1.00	
86-50-0	AZINPHOS-METHYL	ND		ug/L	0.5	0.12	1.00	
2921-88-2	CHLORPYRIFOS	ND		ug/L	0.1	0.04	1.00	
72-54-8	4,4-DDD	ND		ug/L	0.1	0.02	1.00	
72-55-9	4,4-DDE	ND		ug/L	0.1	0.02	1.00	
50-29-3	4,4-DDT	ND		ug/L	0.1	0.03	1.00	
115-32-2	DICOFOL	ND		ug/L	1	-	1.00	
121-75-5	MALATHION	ND		ug/L	0.1	0.05	1.00	
298-00-0	METHYL PARATHION	ND		ug/L	0.5	0.1	1.00	
56-38-2	PARATHION-ETHYL	ND		ug/L	0.1	0.05	1.00	
732-11-6	PHOSMET	ND		ug/L	0.5	-	1.00	
43121-43-	TRIADIMEFON	ND		ug/L	0.1	0.07	1.00	
68694-11-	TRIFLUMIZOLE	ND		ug/L	1.0	1.0	1.00	
950-37-8	METHIDATHINON	ND		ug/L	0.5	0.5	1.00	
88671-89-	MYCLOBUTANIL	ND		ug/L	0.5	0.5	1.00	

es:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.
ND - indicates the compound was not detected above the PQL or MDL.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor.

If you have any questions concerning this report contact at the above phone number.

Form: c608.rpt

CAS	Compound	RESULT	Flag	UNITS	PQL	MDL	D.F.	COMMENT
51235-04-	HEXAZINONE	**ND**		ug/L	0.1	0.05	1.00	
2312-35-8	PROPARGITE	**ND**		ug/L		-	1.00	Qualitative analysis

:S:

Flags are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.
ND - indicates the compound was not detected above the PQL or MDL.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor.

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WSDOE Lab C1251

DATA REPORT

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Reference Number: **09-07724**
Project: HBDIC Recharge Project

Lab Number: 16046
Field ID: HBDIC OBS #1
Sample Description: Duplicated
Matrix: Water
Sample Date: 5/27/09
Extraction Date: 6/9/09
Extraction Method: 3535

Report Date: 7/14/09
Date Analyzed: 7/6/09
Analyst: CO
Peer Review:
Analytical Method: 525.2
Batch: 525X_090609

CAS	Compound	RESULT	Flag	UNITS	PQL	MDL	D.F.	COMMENT
80-05-7	BISPHENOL-A	**1.5**		ug/L	1		1.00	
60-51-5	DIMETHOATE	**ND**		ug/L	0.5	0.03	1.00	
57837-19-	METALAXYL	**ND**		ug/L	0.1	-	1.00	
1299-99-	NAPROPAMIDE	**ND**		ug/L	0.1	0.05	1.00	
122-34-9	SIMAZINE	**ND**		ug/L	0.1	0.03	1.00	
86-86-2	1-NAPHTHALENEACETAMIDE	**ND**		ug/L	0.5	-	1.00	
333-41-5	DIAZINON	**ND**		ug/L	0.1	0.04	1.00	
60168-88-	FENARIMOL	**ND**		ug/L	0.1	0.03	1.00	
58-89-9	LINDANE (BHC - GAMMA)	**ND**		ug/L	0.1	0.03	1.00	
7786-34-7	MEVINPHOS	**ND**		ug/l	0.1	0.03	1.00	
86-50-0	AZINPHOS-METHYL	**ND**		ug/L	0.5	0.12	1.00	
2921-88-2	CHLORPYRIFOS	**ND**		ug/L	0.1	0.04	1.00	
72-54-8	4,4-DDD	**ND**		ug/L	0.1	0.02	1.00	
72-55-9	4,4-DDE	**ND**		ug/L	0.1	0.02	1.00	
50-29-3	4,4-DDT	**ND**		ug/L	0.1	0.03	1.00	
115-32-2	DICOFOL	**ND**		ug/L	1	-	1.00	
121-75-5	MALATHION	**ND**		ug/L	0.1	0.05	1.00	
298-00-0	METHYL PARATHION	**ND**		ug/L	0.5	0.1	1.00	
56-38-2	PARATHION-ETHYL	**ND**		ug/L	0.1	0.05	1.00	
732-11-6	PHOSMET	**ND**		ug/L	0.5	-	1.00	
43121-43-	TRIADIMEFON	**ND**		ug/L	0.1	0.07	1.00	
68694-11-	TRIFLUMIZOLE	**ND**		ug/L	1.0	1.0	1.00	
950-37-8	METHIDATHINON	**ND**		ug/L	0.5	0.5	1.00	
88671-89-	MYCLOBUTANIL	**ND**		ug/L	0.5	0.5	1.00	

tes:
gs are data qualifiers. If there are data qualifiers on your report definitions can be found on an accompanying sheet.
ND - indicates the compound was not detected above the PQL or MDL.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor.

If you have any questions concerning this report contact at the above phone number.

CAS	Compound	RESULT	Flag	UNITS	PQL	MDL	D.F.	COMMENT
51235-04-	HEXAZINONE	**ND**		ug/L	0.1	0.05	1.00	
2312-35-8	PROPARGITE	**ND**		ug/L		-	1.00	Qualitative analysis

.es:

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
515.4_090603	2,4 - D	8.9	10	ug/L	515.4	89	70-130		LFB	
	2,4 - DCAA (SURR)	93		%	515.4		70-130			
	2,4 DB	33.9	40	ug/L	515.4	85	70-130			
	2,4,5 - TP (SILVEX)	5.17	5	ug/L	515.4	103	70-130			
	2,4,5 T	5.35	5	ug/L	515.4	107	70-130			
	ACIFLUORFEN	5.1	5	ug/L	515.4	102	70-130			
	BENTAZON	10.6	10	ug/L	515.4	106	70-130			
	CHLORAMBEN	0.17	0.25	ug/L	515.4	68	70-130	C1		
	DALAPON	59.3	65	ug/L	515.4	91	70-130			
	DCPA (ACID METABOLITES)	4.92	5	ug/L	515.4	98	70-130			
	DICAMBA	4.8	5	ug/L	515.4	96	70-130			
	DICHLORPROP	13.3	15	ug/L	515.4	89	70-130			
	DINOSEB	10.4	10	ug/L	515.4	104	70-130			
	PENTACHLOROPHENOL	4.92	5	ug/L	515.4	98	70-130			
	PICLORAM	5.55	5	ug/L	515.4	111	70-130			
525_090609	1,3-DIMETHYL-2-NITROBENZENE (Surr)	90		%	525.2		70-130		LFB	
	4,4-DDD	0.9	1	ug/L	525.2	90	70-130			
	4,4-DDE	0.95	1	ug/L	525.2	95	70-130			
	4,4-DDT	0.86	1	ug/L	525.2	86	70-130			
	LINDANE (BHC - GAMMA)	0.92	1	ug/L	525.2	92	70-130			
	PERYLENE-D12 (Surr)	96		%	525.2		70-130			
	PYRENE-D10 (Surr)	101		%	525.2		70-130			
	SIMAZINE	1.05	1	ug/L	525.2	105	70-130			
	TRIPHENYLPHOSPHATE (Surr)	102		%	525.2		70-130			
525X_090609	1-NAPHTHALENEACETAMIDE	1.5	2	ug/L	525.2	75	70-130		LFB	
	AZINPHOS-METHYL	1	1	ug/L	525.2	100	70-130			
	BISPHENOL-A	4.9	5	ug/L	525.2	98	85-115			
	CHLORPYRIFOS	2.7	3	ug/L	525.2	90	70-130			
	DICOFOL	1.6	2	ug/L	525.2	80	70-130			
	DIMETHOATE	0.2	1	ug/L	525.2	20	70-130	N1		
	FENARIMOL	0.8	1	ug/L	525.2	80	70-130			
	HEXAZINONE	0.9	1	ug/L	525.2	90	70-130			

*Notation:

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525X_090609	MALATHION	2.2	2	ug/L	525.2	110	70-130		LFB	
	METALAXYL	1.9	2	ug/L	525.2	95	70-130			
	METHIDATHINON	1.9	2	ug/L	525.2	95	85-115			
	METHYL PARATHION	0.85	1	ug/L	525.2	85	70-130			
	MEVINPHOS	1.6	2	ug/L	525.2	80	70-130			
	MYCLOBUTANIL	1.85	2	ug/L	525.2	93	85-115			
	NAPROPAMIDE	0.85	1	ug/L	525.2	85	70-130			
	PARATHION-ETHYL	1.8	2	ug/L	525.2	90	70-130			
	PHOSMET	1.8	2	ug/L	525.2	90	70-130			
	PROPARGITE	1.9	2	ug/L	525.2	95	85-115			
	TRIADIMEFON	0.7	1	ug/L	525.2	70	70-130			
	TRIFLUMIZOLE	1.6	2	ug/L	525.2	80	85-115			
525X_090609	1-NAPHTHALENEACETAMIDE	2.5	2	ug/L	525.2	125	70-130		LFB	
	AZINPHOS-METHYL	1.5	1	ug/L	525.2	150	70-130			
	CHLORPYRIFOS	3.7	3	ug/L	525.2	123	70-130			
	DICOFOL	3.5	3	ug/L	525.2	117	70-130			
	DIMETHOATE	0.8	1	ug/L	525.2	80	70-130			
	FENARIMOL	2.3	2	ug/L	525.2	115	70-130			
	HEXAZINONE	1.2	1	ug/L	525.2	120	70-130			
	MALATHION	4.3	4	ug/L	525.2	108	70-130			
	METALAXYL	2.3	2	ug/L	525.2	115	70-130			
	METHIDATHINON	3.8	2	ug/L	525.2	190	85-115			
	METHYL PARATHION	1.6	2	ug/L	525.2	80	70-130			
	MEVINPHOS	2.8	2	ug/L	525.2	140	70-130			
	MYCLOBUTANIL	2.7	2	ug/L	525.2	135	85-115			
	NAPROPAMIDE	1.1	1	ug/L	525.2	110	70-130			
	PARATHION-ETHYL	2.3	3	ug/L	525.2	77	70-130			
	PHOSMET	3.3	2	ug/L	525.2	165	70-130			
	PROPARGITE	3.5	2	ug/L	525.2	175	85-115			
	TRIADIMEFON	2.3	2	ug/L	525.2	115	70-130			
	TRIFLUMIZOLE	2.3	2	ug/L	525.2	115	85-115			
531_090603	3-HYDROXYCARBOFURAN	10.7	10	ug/L	531.2	107	70-130		LFB	
	ALDICARB	10.3	10	ug/L	531.2	103	70-130			
	ALDICARB SULFONE	11.5	10	ug/L	531.2	115	70-130			

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FORM: QC Independent

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_090603	ALDICARB SULFOXIDE	10.3	10	ug/L	531.2	103	70-130		LFB	
	BDMC (SURR)	110		%	531.2		70-130			
	CARBARYL	10.4	10	ug/L	531.2	104	70-130			
	CARBOFURAN	10.5	10	ug/L	531.2	105	70-130			
	METHIOCARB	11.1	10	ug/L	531.2	111	70-130			
	METHOMYL	10.2	10	ug/L	531.2	102	70-130			
	OXYMAL	12.8	10	ug/L	531.2	128	70-130			
	PROPOXUR (BAYGON)	10.9	10	ug/L	531.2	109	70-130			
531_090603	3-HYDROXYCARBOFURAN	20	20	ug/L	531.2	100	70-130		LFB	
	ALDICARB	18.5	20	ug/L	531.2	93	70-130			
	ALDICARB SULFONE	21.6	20	ug/L	531.2	108	70-130			
	ALDICARB SULFOXIDE	19	20	ug/L	531.2	95	70-130			
	BDMC (SURR)	106		%	531.2		70-130			
	CARBARYL	18.7	20	ug/L	531.2	94	70-130			
	CARBOFURAN	19.5	20	ug/L	531.2	98	70-130			
	METHIOCARB	19.6	20	ug/L	531.2	98	70-130			
	METHOMYL	20.2	20	ug/L	531.2	101	70-130			
	OXYMAL	22.5	20	ug/L	531.2	113	70-130			
	PROPOXUR (BAYGON)	20.2	20	ug/L	531.2	101	70-130			
COD_090602	CHEMICAL OXYGEN DEMAND	47	50	mg/L	SM5220 D	94	80-120		LFB	
OPHOS-090529B	ORTHO-PHOSPHATE	0.96	1.00	mg/L	SM4500-P F	96	80-120		LFB	
tds_090603	TOTAL DISSOLVED SOLIDS	494	500	mg/L	SM2540 C	99	80-120		LFB	
tds_090603	TOTAL DISSOLVED SOLIDS	464	500	mg/L	SM2540 C	93	80-120		LFB	
TKN-090603	TOTAL KJELDAHL NITROGEN	3.20	3.00	mg/L	SM4500-Norg C	107	80-120		LFB	
TOC_090602	TOTAL ORGANIC CARBON	1.04	1.00	mg/L	SM5310 B	104	90-110		LFB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090529	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	
TSS_090529	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	
TSS_090529	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Low Level Laboratory Fortified Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
515.4_090603	2,4 - D	0.34	0.25	ug/L	515.4	136	50-150		LFBD	
	2,4 - DCAA (SURR)	104		%	515.4		70-130			
	2,4 DB	1.6	2	ug/L	515.4	80	50-150			
	2,4,5 - TP (SILVEX)	0.12	0.125	ug/L	515.4	96	50-150			
	2,4,5 T	0.14	0.125	ug/L	515.4	112	50-150			
	ACIFLUORFEN	0.28	0.25	ug/L	515.4	112	50-150			
	BENTAZON	0.36	0.5	ug/L	515.4	72	50-150			
	DALAPON	1.59	1.6	ug/L	515.4	99	50-150			
	DCPA (ACID METABOLITES)	0.2	0.125	ug/L	515.4	160	50-150	C1		
	DICAMBA	0.13	0.125	ug/L	515.4	104	50-150			
	DICHLORPROP	0.47	0.375	ug/L	515.4	125	50-150			
	DINOSEB	0.24	0.25	ug/L	515.4	96	50-150			
	PENTACHLOROPHENOL	0.11	0.125	ug/L	515.4	88	50-150			
	PICLORAM	0.13	0.125	ug/L	515.4	104	50-150			
531_090603	3-HYDROXYCARBOFURAN	0.97	1	ug/L	531.2	97	50-150		LFBD	
	ALDICARB	0.95	1	ug/L	531.2	95	50-150			
	ALDICARB SULFONE	0.98	1	ug/L	531.2	98	50-150			
	ALDICARB SULFOXIDE	0.75	1	ug/L	531.2	75	50-150			
	BDMC (SURR)	105		%	531.2		50-150			
	CARBARYL	0.93	1	ug/L	531.2	93	50-150			
	CARBOFURAN	1	1	ug/L	531.2	100	50-150			
	METHIOCARB	0.98	1	ug/L	531.2	98	50-150			
	METHOMYL	1	1	ug/L	531.2	100	50-150			
	OXYMAL	1.2	1	ug/L	531.2	120	50-150			
	PROPOXUR (BAYGON)	1	1	ug/L	531.2	100	50-150			

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Reagent Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
COD_090602	CHEMICAL OXYGEN DEMAND	ND		mg/L	SM5220 D		4.00000		LRB	
I090529A	CHLORIDE	ND		mg/L	300.0		0.10000		LRB	
	NITRATE-N	ND		mg/L	300.0		0.10000			
OPHOS-090529B	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		LRB	
TKN-090603	TOTAL KJELDAHL NITROGEN	ND		mg/L	SM4500-Norg C		1.00000		LRB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	QC Limits	Qualifier	Type*	Comment
515.4_090603	2,4 - D	ND		ug/L	515.4		0.10000		MB	
	2,4 - DCAA (SURR)	87		%	515.4					
	2,4 DB	ND		ug/L	515.4		0.60000			
	2,4,5 - TP (SILVEX)	ND		ug/L	515.4		0.08000			
	2,4,5 T	ND		ug/L	515.4		0.08000			
	ACIFLUORFEN	ND		ug/L	515.4		0.08000			
	BENTAZON	ND		ug/L	515.4		0.10000			
	CHLORAMBEN	ND		ug/L	515.4		0.08000			
	DALAPON	ND		ug/L	515.4		1.00000			
	DCPA (ACID METABOLITES)	ND		ug/L	515.4		0.08000			
	DICAMBA	ND		ug/L	515.4		0.08000			
	DICHLORPROP	ND		ug/L	515.4		0.20000			
	DINOSEB	ND		ug/L	515.4		0.10000			
	PENTACHLOROPHENOL	ND		ug/L	515.4		0.08000			
	PICLORAM	ND		ug/L	515.4		0.08000			
525_090609	1,3-DIMETHYL-2-NITROBENZENE (Surr)	89		%	525.2				MB	
	4,4-DDD	ND		ug/L	525.2		0.05000			
	4,4-DDE	ND		ug/L	525.2		0.05000			
	4,4-DDT	ND		ug/L	525.2		0.05000			
	LINDANE (BHC - GAMMA)	ND		ug/L	525.2		0.02000			
	PERYLENE-D12 (Surr)	87		%	525.2					
	PYRENE-D10 (Surr)	100		%	525.2					
	SIMAZINE	ND		ug/L	525.2		0.02000			
	TRIPHENYLPHOSPHATE (Surr)	126		%	525.2					
525X_090609	1-NAPHTHALENEACETAMIDE	ND		ug/L	525.2		0.10000		MB	
	AZINPHOS-METHYL	ND		ug/L	525.2		0.00000			
	CHLORPYRIFOS	ND		ug/L	525.2		0.00000			
	DICOFOL	ND		ug/L	525.2		0.00000			
	DIMETHOATE	ND		ug/L	525.2		0.00000			
	FENARIMOL	ND		ug/L	525.2		0.00000			
	HEXAZINONE	ND		ug/L	525.2		0.00000			
	MALATHION	ND		ug/L	525.2		0.05000			

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Method Blank

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Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525X_090609	METALAXYL	ND		ug/L	525.2		0.10000		MB	
	METHIDATHINON	ND		ug/L	525.2		0.50000			
	METHYL PARATHION	ND		ug/L	525.2		0.00000			
	MEVINPHOS	ND		ug/L	525.2		0.00000			
	MYCLOBUTANIL	ND		ug/L	525.2		0.50000			
	NAPROPAMIDE	ND		ug/L	525.2		0.00000			
	PARATHION-ETHYL	ND		ug/L	525.2		0.05000			
	PHOSMET	ND		ug/L	525.2		0.10000			
	PROPARGITE	ND		ug/L	525.2		0.00000			
	TRIADIMEFON	ND		ug/L	525.2		0.00000			
	TRIFLUMIZOLE	ND		ug/L	525.2		1.00000			
1_090603	3-HYDROXYCARBOFURAN	ND		ug/L	531.2		0.50000		MB	
	ALDICARB	ND		ug/L	531.2		0.25000			
	ALDICARB SULFONE	ND		ug/L	531.2		0.40000			
	ALDICARB SULFOXIDE	ND		ug/L	531.2		0.25000			
	CARBARYL	ND		ug/L	531.2		0.50000			
	CARBOFURAN	ND		ug/L	531.2		0.45000			
	METHIOCARB	ND		ug/L	531.2		1.00000			
	METHOMYL	ND		ug/L	531.2		0.25000			
	OXYMAL	ND		ug/L	531.2		1.00000			
	PROPOXUR (BAYGON)	ND		ug/L	531.2		0.25000			
OPHOS-090529B	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		MB	
tds_090603	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	
tds_090603	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	
TKN-090603	TOTAL KJELDAHL NITROGEN	ND		mg/L	SM4500-Norg C		0.12000		MB	
TOC_090602	TOTAL ORGANIC CARBON	ND		mg/L	SM5310 B		0.12000		MB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

= Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

FORM: QC Independent

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090529	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090529	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090529	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

= Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: 09-07724
Report Date: 07/14/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_090603	3-HYDROXYCARBOFURAN	54.5	46.9	ug/L	531.2	116	70-130		QCS	
	ALDICARB	29.8	29.5	ug/L	531.2	101	70-130			
	ALDICARB SULFONE	26.9	25.5	ug/L	531.2	105	70-130			
	ALDICARB SULFOXIDE	45.8	40	ug/L	531.2	115	70-130			
	BDMC (SURR)	113		%	531.2		70-130			
	CARBARYL	59.8	57.8	ug/L	531.2	103	70-130			
	CARBOFURAN	84.6	81.2	ug/L	531.2	104	70-130			
	METHIOCARB	64.9	58.1	ug/L	531.2	112	70-130			
	METHOMYL	57.7	53.7	ug/L	531.2	107	70-130			
	OXYMAL	52.5	51.2	ug/L	531.2	103	70-130			
	PROPOXUR (BAYGON)	96.9	91.2	ug/L	531.2	106	70-130			
D_090602	CHEMICAL OXYGEN DEMAND	92	92	mg/L	SM5220 D	100	80-120		QCS	
I090529A	CHLORIDE	30.3	30.0	mg/L	300.0	101	80-120		QCS	
	NITRATE-N	2.39	2.50	mg/L	300.0	96	80-120			
OPHOS-090529B	ORTHO-PHOSPHATE	0.46	0.49	mg/L	SM4500-P F	94	80-120		QCS	
TKN-090603	TOTAL KJELDAHL NITROGEN	3.08	3.00	mg/L	SM4500-Norg C	103	80-120		QCS	
TOC_090602	TOTAL ORGANIC CARBON	4.62	4.50	mg/L	SM5310 B	103	90-110		QCS	

*Notation:

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FORM: QC Independent

ANALYTICAL LABORATORIES

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QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 09-07724
Report Date: 7/14/2009

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
525_090609									
	16046	1,3-DIMETHYL-2-NITROBENZENE (Surr	90	90	%	**0.0**	0-45	DUP	
	16046	PYRENE-D10 (Surr)	98	101	%	**3.0**	0-45	DUP	
	16046	PERYLENE-D12 (Surr)	89	98	%	**9.6**	0-45	DUP	
	16046	TRIPHENYLPHOSPHATE (Surr)	112	108	%	**3.6**	0-45	DUP	
525X_090609									
	16046	BISPHENOL-A	1.5	1.2	ug/L	**22.2**	0-20	DUP	
	16046	1,3-DIMETHYL-2-NITROBENZENE (Surr	90	90	%	**0.0**	0-45	DUP	
	16046	PYRENE-D10 (Surr)	98	94	%	**4.2**	0-45	DUP	
	16046	PERYLENE-D12 (Surr)	89	92	%	**3.3**	0-45	DUP	
	16046	TRIPHENYLPHOSPHATE (Surr)	112	107	%	**4.6**	0-45	DUP	
COD_090602									
I090529A									
	16045	NITRATE-N	0.12	0.12	mg/L	**0.0**	0-45	DUP	
	16045	CHLORIDE	0.4	0.4	mg/L	**0.0**	0-45	DUP	
	16095	NITRATE-N	7.07	7.06	mg/L	**0.1**	0-45	DUP	
	16095	CHLORIDE	7.26	7.25	mg/L	**0.1**	0-45	DUP	
	16104	NITRATE-N	1.33	1.33	mg/L	**0.0**	0-45	DUP	
	16104	CHLORIDE	110	110	mg/L	**0.0**	0-45	DUP	
OPHOS-090529B									
	16102	ORTHO-PHOSPHATE	0.24	0.22	mg/L	**8.7**	0-50	DUP	
	16103	ORTHO-PHOSPHATE	0.24	0.23	mg/L	**4.3**	0-50	DUP	
TDS_090603									
	16530	TOTAL DISSOLVED SOLIDS	155	144	mg/L	**7.4**	0-45	DUP	
TKN-090603									
	15417	TOTAL KJELDAHL NITROGEN	40.6	40.8	mg/L	**0.5**	0-45	DUP	
	15714	TOTAL KJELDAHL NITROGEN	0.68	0.62	mg/L	**9.2**	0-45	DUP	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
	15999	TOTAL KJELDAHL NITROGEN	31.0	29.0	mg/L	**6.7**	0-45	DUP	
TOC_090602									
	15883	TOTAL ORGANIC CARBON	0.95	0.94	mg/L	**1.1**	0-50	DUP	
	16085	TOTAL ORGANIC CARBON	2.16	2.13	mg/L	**1.4**	0-50	DUP	
	16124	TOTAL ORGANIC CARBON	4.27	4.29	mg/L	**0.5**	0-50	DUP	
	16209	TOTAL ORGANIC CARBON	1.68	1.67	mg/L	**0.6**	0-50	DUP	
TSS_090529									

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

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Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
515.4_090603														
	15704	2,4 - D	ND	4.27	4.34	5	ug/L	**85**	**87**	70-130	**1.6**	0-50	LFM	
	15704	2,4,5 - TP (SILVEX)	ND	2.42	2.51	2.5	ug/L	**97**	**100**	70-130	**3.7**	0-50	LFM	
	15704	PENTACHLOROPHENOL	ND	2.45	2.44	2.5	ug/L	**98**	**98**	70-130	**0.4**	0-50	LFM	
	15704	DALAPON	ND	26.6	27.4	32.5	ug/L	**82**	**84**	70-130	**3.0**	0-50	LFM	
	15704	DINOSEB	ND	4.89	5.02	5	ug/L	**98**	**100**	70-130	**2.6**	0-50	LFM	
	15704	PICLORAM	ND	2.79	2.9	2.5	ug/L	**112**	**116**	70-130	**3.9**	0-50	LFM	
	15704	DICAMBA	ND	2.52	2.39	2.5	ug/L	**101**	**96**	70-130	**5.3**	0-50	LFM	
	15704	DCPA (ACID METABOLITES)	ND	2.44	2.52	2.5	ug/L	**98**	**101**	70-130	**3.2**	0-50	LFM	
	15704	2,4 DB	ND	19.9	20.8	20	ug/L	**100**	**104**	70-130	**4.4**	0-50	LFM	
	15704	2,4,5 T	ND	2.45	2.52	2.5	ug/L	**98**	**101**	70-130	**2.8**	0-50	LFM	
	15704	BENTAZON	ND	4.96	4.89	5	ug/L	**99**	**98**	70-130	**1.4**	0-50	LFM	
	15704	DICHLORPROP	ND	6.48	6.61	7.2	ug/L	**90**	**92**	70-130	**2.0**	0-50	LFM	
	15704	ACIFLUORFEN	ND	2.79	2.9	2.5	ug/L	**112**	**116**	70-130	**3.9**	0-50	LFM	
	15704	CHLORAMBEN	ND	2.14	1.98	2.5	ug/L	**86**	**79**	70-130	**7.8**	0-50	LFM	
	15704	2,4 - DCAA (SURR)	97	87	95		%		**NA**	70-130	**NA**	0-50	LFM	
525_090609														
	16530	SIMAZINE	ND	1.12		1	mg/L	**112**	**NA**	70-130	**NA**	0-60	LFM	
	16530	LINDANE (BHC - GAMMA)	ND	0.92		1	ug/L	**92**	**NA**	70-130	**NA**	0-60	LFM	
	16530	4,4-DDD	ND	0.91		1	ug/L	**91**	**NA**	70-130	**NA**	0-60	LFM	
	16530	4,4-DDE	ND	0.94		1	ug/L	**94**	**NA**	70-130	**NA**	0-60	LFM	
	16530	4,4-DDT	ND	0.86		1	ug/L	**86**	**NA**	70-130	**NA**	0-60	LFM	
	16530	MALATHION	ND	2.28		2	ug/L	**114**	**NA**	70-130	**NA**	0-60	LFM	
	16530	PARATHION-ETHYL	ND	1.89		2	ug/L	**95**	**NA**	70-130	**NA**	0-60	LFM	
	16530	1,3-DIMETHYL-2-NITROBENZENE (Surr	91	91			%		**NA**	70-130	**NA**	0-60	LFM	
	16530	PYRENE-D10 (Surr)	99	95			%		**NA**	70-130	**NA**	0-60	LFM	
	16530	PERYLENE-D12 (Surr)	86	92			%		**NA**	70-130	**NA**	0-60	LFM	
	16530	TRIPHENYLPHOSPHATE (Surr)	130	104			%		**NA**	70-130	**NA**	0-60	LFM	
531_090603														
	13727	OXYMAL	ND	9	10.3	10	ug/L	**90**	**103**	70-130	**13.5**	0-50	LFM	
	13727	CARBOFURAN	ND	9.3	9.9	10	ug/L	**93**	**99**	70-130	**6.3**	0-50	LFM	
	13727	ALDICARB SULFOXIDE	ND	8.3	8.9	10	ug/L	**83**	**89**	70-130	**7.0**	0-50	LFM	
	13727	ALDICARB SULFONE	ND	9	10.4	10	ug/L	**90**	**104**	70-130	**14.4**	0-50	LFM	
	13727	METHOMYL	ND	9	9	10	ug/L	**90**	**90**	70-130	**0.0**	0-50	LFM	
	13727	3-HYDROXYCARBOFURAN	ND	9.1	9.7	10	ug/L	**91**	**97**	70-130	**6.4**	0-50	LFM	
	13727	ALDICARB	ND	8.7	9.4	10	ug/L	**87**	**94**	70-130	**7.7**	0-50	LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

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Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier		Comments
	13727	CARBARYL	ND	8.95	9.3	10	ug/L	**90**	**93**	70-130	**3.8**	0-50		LFM	
	13727	PROPOXUR (BAYGON)	ND	9.6	10.1	10	ug/L	**96**	**101**	70-130	**5.1**	0-50		LFM	
	13727	METHIOCARB	ND	9.4	9.4	10	ug/L	**94**	**94**	70-130	**0.0**	0-50		LFM	
	13727	BDMC (SURR)	105	109	114		%		**NA**	70-130	**NA**	0-50		LFM	
	16045	OXYMAL	ND	2.2		2	ug/L	**110**	**NA**	70-130	**NA**	0-50		LFM	
	16045	CARBOFURAN	ND	2		2	ug/L	**100**	**NA**	70-130	**NA**	0-50		LFM	
	16045	ALDICARB SULFOXIDE	ND	1.9		2	ug/L	**95**	**NA**	70-130	**NA**	0-50		LFM	
	16045	ALDICARB SULFONE	ND	2.4		2	ug/L	**120**	**NA**	70-130	**NA**	0-50		LFM	
	16045	METHOMYL	ND	1.8		2	ug/L	**90**	**NA**	70-130	**NA**	0-50		LFM	
	16045	3-HYDROXYCARBOFURAN	ND	2.1		2	ug/L	**105**	**NA**	70-130	**NA**	0-50		LFM	
	16045	ALDICARB	ND	1.9		2	ug/L	**95**	**NA**	70-130	**NA**	0-50		LFM	
	16045	CARBARYL	ND	2		2	ug/L	**100**	**NA**	70-130	**NA**	0-50		LFM	
	16045	PROPOXUR (BAYGON)	ND	2		2	ug/L	**100**	**NA**	70-130	**NA**	0-50		LFM	
	16045	METHIOCARB	ND	2		2	ug/L	**100**	**NA**	70-130	**NA**	0-50		LFM	
	16045	BDMC (SURR)	113	95			%		**NA**	70-130	**NA**	0-50		LFM	
COD_090602															
	16096	CHEMICAL OXYGEN DEMAND	ND	49	45	50	mg/L	**98**	**90**	80-120	**8.5**	0-60		LFM	
	16103	CHEMICAL OXYGEN DEMAND	ND	46	45	50	mg/L	**92**	**90**	80-120	**2.2**	0-60		LFM	
I090529A															
	16045	NITRATE-N	0.12	1.1		1.00	mg/L	**98**	**NA**	80-120	**NA**	0-60		LFM	
	16045	CHLORIDE	0.4	1.4		1.00	mg/L	**100**	**NA**	80-120	**NA**	0-60		LFM	
	16095	NITRATE-N	7.07	8		1.00	mg/L	**93**	**NA**	80-120	**NA**	0-60		LFM	
	16095	CHLORIDE	7.26	8.12		1.00	mg/L	**86**	**NA**	80-120	**NA**	0-60	M	LFM	
	16104	NITRATE-N	1.33	20.8		20.00	mg/L	**97**	**NA**	80-120	**NA**	0-60		LFM	
	16104	CHLORIDE	110	128		20.00	mg/L	**90**	**NA**	80-120	**NA**	0-60		LFM	
OPHOS-090529B															
	16102	ORTHO-PHOSPHATE	0.24	1.21	1.20	1.00	mg/L	**97**	**96**	70-130	**1.0**	0-50		LFM	
	16103	ORTHO-PHOSPHATE	0.24	1.19	1.19	1.00	mg/L	**95**	**95**	70-130	**0.0**	0-50		LFM	
TKN-090603															
	15736	TOTAL KJELDAHL NITROGEN	118	170		40.0	mg/L	**130**		70-130	**NA**	0-60		LFM	
	15737	TOTAL KJELDAHL NITROGEN	20.0	41.0		20.0	mg/L	**105**		70-130	**NA**	0-60		LFM	
	15862	TOTAL KJELDAHL NITROGEN	0.42	2.54		2.00	mg/L	**106**		70-130	**NA**	0-60		LFM	
TOC_090602															
	16085	TOTAL ORGANIC CARBON	2.16	6.13	6.14	4.00	mg/L	**99**	**100**	65-135	**0.3**	0-70		LFM	
	16209	TOTAL ORGANIC CARBON	1.68	5.63	5.76	4.00	mg/L	**99**	**102**	65-135	**3.2**	0-70		LFM	

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Qualifier Definitions

Reference Number: 09-07724
Report Date: 07/14/09

Qualifier	Definition
B1	The source of the contamination has been identified as a contaminate in the lab purified water. Data for this compound is suspect if reported.
C1	The compound is co-eluting and increases the amount of error with quantitation.
M	Matrix induced bias assumed.
ME	Matrix spike shows a possible matrix induced bias. The LFB was within acceptance limits, results for this compound are suspect.
N1	Acceptance limits have not been established, the limits listed are for guidance only.

Note: Some qualifier definitions found on this page may pertain to results or QC data which are not printed with this report.

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 09-07724
Report Date: 07/14/09

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
515.4_090603						
16045	2,4 - DCAA (SURR)	99		%	515.4	Acceptance Range is 70 - 130%
525_090609						
16045	1,3-DIMETHYL-2-NITROBENZENE (Surr)	91		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	98		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	86		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	102		%		Acceptance Range is 70% to 130%
531_090603						
16045	BDMC (SURR)	113		%	531.2	
515.4_090603						
16046	2,4 - DCAA (SURR)	96		%	515.4	Acceptance Range is 70 - 130%
525_090609						
16046	1,3-DIMETHYL-2-NITROBENZENE (Surr)	90		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	98		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	89		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	112		%		Acceptance Range is 70% to 130%
531_090603						
16046	BDMC (SURR)	109		%	531.2	

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

Page 1 of 1

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

6558

Report to:	Walla Walla Basin Watershed Cour	Bill to:	Same ←
Ship Address:	810 S Main Street	Address:	
City:	Milton-Freewa St: OR Zip: 97862	City: St: Zip:	
Attn:	Bob Bower	Phone: FAX:	
Phone:	541.938-2170 FAX:	P.O.#: Attn:	
Email:	bob.bower@wwbwc.org	☐ Visa ☐ M/C ☐ A/E Expires /	
Project	HBDIC Recharge Project	Card#:	

For Lab Use Only
Ref #

Check Regulatory Program
- ☐ Safe Drinking Water Act
- ☐ Clean Water Act
- ☐ RCRA / CERCLA
- ☒ Other Recharge Project

ENCO ANALYTICAL LABORATORIES
1620 S. Walnut St.
Burlington, WA 98233
1.800.755.9295
805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

Analyses Requested

Instructions
- Use one line per sample Location.
- Be specific in analysis requests.
- Check off analyses to be performed for each sample Loaction.
- Enter number of containers.

Turn Around Time Required
- ☒ Standard
- ☐ Half-time (50% surcharge)
- ☐ Quickest (100% surcharge)
- ☐ Other

CO006558

	Field ID	Location	Grab/ Comp.	Sample Matrix*	Date	Time	NO3/Cl/TDS/O-Phos	SOC Package	TKN/COD	TOC	TSS				Number of Containers	Special Instructions Conditions on Receipt
1	HBDIC OBS #1	Observation well #1	C		5-27-9	5:35	☑	☑	☑	☒	☒	☐	☐	☐		none
2	" "	" — Duplicated	C		5-27-9	5:45	☑	☑	☑	☒	☒	☐	☐	☐		
3							☐	☐	☐	☐	☐	☐	☐	☐		
4							☐	☐	☐	☐		☐	☐	☐		
5							☐	☐	☐	☐		☐	☐	☐		
6							☐	☐	☐	☐		☐	☐	☐		
7							☐	☐	☐	☐		☐	☐	☐		
8							☐	☐	☐	☐		☐	☐	☐		
9							☐	☐	☐	☐		☐	☐	☐		
10							☐	☐	☐	☐		☐	☐	☐		

09-07724
16045 - 16046

B/ Bob 509-520-3534

One TOC vial = duplicated broken upon arrival

+515-2 = duplicated

Sampled by: Phone: FAX: Email: Total Containers

Sample Receipt Request (Must include FAX or Email) ☐

* **W** - water **DW** - drinking water **GW** - Ground water **SW** - surface water **S** - soil **WW** - waste water **OL** - oil Other_____

Relinquished by	Date	Time	Received by	Date	Time
B-1 Bower	5-27-9	8:00pm			
				5-29-09	8:30

	Yes	No	N/A
Custody seals intact	☐	☐	☒
Sample temp 4 C satisfactory	☒	☐	☐
Samples received intact	☒	☐	
Chain of custody & labels agree	☒	☐	

ups

NO 47721

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
11 / 19 / 08	10 : 45 ☒ AM ☐ PM	

Type of Water System (check only one box)
☐ Group A Public ☐ Private Household
☐ Group B Public ☒ Other ASR

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# ___ ___ ___ ___ ___ ___
System Name: WWBWC
Contact Person: BOB BOWER
Day Phone: (541) 938-2170 Cell Phone: (509) 520-3534
Eve. Phone: ( ) FAX: ( )

Send results to: (Print full name, address and zip code)
WALLA WALLA BASIN WATERSHED COUNCIL
810 So. MAIN P.O. BOX 68
MILTON-FREEWATER, OR. 97862

SAMPLE INFORMATION

Sample collected by (name): BOB BOWER
Specific location where sample collected (address or sample site, and type of faucet): INTAKE
Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
___ ___ ___ ___ ___ ___ ___ ___
Unsatisfactory routine collect date:
_____/_____/_____
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☒ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources)
S | | | | ☐ Total Coliform ☐ Fecal Coliform
Public Systems must provide Source Number from (WFI)

4. ☐ **Sample Collected for Information Only**
Construction_____ Repairs_____ Private Residence_____ Other_____

LAB USE ONLY — DRINKING WATER RESULTS — LAB USE ONLY

☐ **Satisfactory**
Total Coliform Absent

☐ **Unsatisfactory**
Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 19.0 /100ml.

MICR Method Code:	Date and Time Received:
☒ 1140 ☐ 1340 ☐ 2720	11/19/08 @ 1:40 PM
Date Analyzed: 11/19/08 CS	Date Reported: 11/20/08
Lab/Sample Number: 143- 06246	Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS
DP CENTER COPY

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
11 / 19 / 08	11 : 00 ☒ AM ☐ PM	

Type of Water System (check only one box)
☐ Group A Public ☐ Private Household
☐ Group B Public ☒ Other ASR

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# ___ ___ ___ ___ ___ ___
System Name: WALLA WALLA BASIN WATERSHED COUNCIL
Contact Person: BOB BOWER

Day Phone: (541) 938-2170	Cell Phone: (509) 520-3435
Eve. Phone: ( )	FAX: ( )

Send results to: (Print full name, address and zip code)
WALLA WALLA BASIN WATERSHED COUNCIL
310 So MAIN P.O. BOX 68
MILTON-FREEWATER, OR 97862

SAMPLE INFORMATION

Sample collected by (name):
BOB BOWER

Specific location where sample collected (address or sample site, and type of faucet):
OBS #1B

Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
___ ___ ___ ___ ___ ___ ___ ___
Unsatisfactory routine collect date:
_____/_____/_____
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☒ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources)
S | | | ☐ Total Coliform ☐ Fecal Coliform
Public Systems must provide Source Number from (WFI)

4. ☐ **Sample Collected for Information Only**
Construction_____ Repairs_____ Private Residence_____ Other_____

LAB USE ONLY **DRINKING WATER RESULTS** LAB USE ONLY

☐ **Satisfactory**
Total Coliform Absent

☐ **Unsatisfactory**
Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 1.0 /100ml.

MICR Method Code: ☒ 1140 ☐ 1340 ☐ 2720	Date and Time Received: 11/19/08 @ 1 to pm
Date Analyzed: 11/19/08 (BS)	Date Reported: 11/20/08
Lab/Sample Number: 143- 06248	Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

DP CENTER COPY

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
11 / 19 / 08	11 : 00 ☒ AM ☐ PM	

Type of Water System (check only one box)
☐ Group A Public ☐ Private Household
☐ Group B Public ☒ Other ASR

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# ___ ___ ___ ___ ___ ___
System Name: WALLA WALLA BASIN WATERSHED COUNCIL
Contact Person: BOB BOWER
Day Phone: (541) 938-2170 Cell Phone: (509) 520-3534
Eve. Phone: ( ) FAX: ( )
Send results to: (Print full name, address and zip code)
WALLA WALLA BASIN WATERSHED COUNCIL
810 S. MAIN P.O. BOX 68
MILTON-FREEWATER, OR, 97862

SAMPLE INFORMATION

Sample collected by (name):
BOB BOWER
Specific location where sample collected (address or sample site, and type of faucet):
OBS #1A
Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
___ ___ ___ ___ ___ ___ ___ ___
Unsatisfactory routine collect date:
_____/_____/_____
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☒ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources)
S | | | | | | | |
☐ Total Coliform
☐ Fecal Coliform
Public Systems must provide Source Number from (WFI)

4. ☐ **Sample Collected for Information Only**
Construction_____ Repairs_____ Private Residence_____ Other_____

LAB USE ONLY — DRINKING WATER RESULTS — LAB USE ONLY

☐ **Satisfactory**
Total Coliform Absent

☐ **Unsatisfactory**
Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 2.0 /100ml.

MICR Method Code:
☒ 1140 ☐ 1340 ☐ 2720

Date and Time Received: 11/19/08 @ 1:40 PM

Date Analyzed: 11/19/08 (BS)

Date Reported: 11/20/08

Lab/Sample Number
143- 06247

Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

DP CENTER COPY

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

December 10, 2008

Mr. Bob Bower
Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

RE: 08-16537 - HBDIC Recharge Project

Dear Mr. Bob Bower,

Your project: HBDIC Recharge Project, was received on Thursday November 20, 2008.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

CO for LJH

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

EDGE Analytical, Inc.

Burlington, WA 98233
(360) 757-1400 - FAX (360) 757-1402

08-16537
12/4/2008

Project Sheet

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Date: 11/20/2008
Reference Number: **08-16537**
Project: HBDIC Recharge Project

Date Received: 11/20/2008
QC Level: 0
Turnaround: Standard
Date Due: **12/4/2008**

Project Notes:

Lab Number	Sample Number	Sample Description	Lab Method	Matrix	Date Sampled	Status
34917.00	OBS #1	Observation Well #1	NO3-N	W	11/19/2008	Pending
34917.00	OBS #1	Observation Well #1	Cl	W	11/19/2008	Pending
34917.00	OBS #1	Observation Well #1	TDS	W	11/19/2008	Pending
34917.00	OBS #1	Observation Well #1	P04-P	W	11/19/2008	Pending
34917.00	OBS #1	Observation Well #1	525.Walla	W	11/19/2008	Pending
34917.10	OBS #1	Observation Well #1	531	W	11/19/2008	Pending
34917.10	OBS #1	Observation Well #1	515	W	11/19/2008	Pending
34917.10	OBS #1	Observation Well #1	TKN	W	11/19/2008	Pending
34917.10	OBS #1	Observation Well #1	COD	W	11/19/2008	Pending
34917.10	OBS #1	Observation Well #1	TOC	W	11/19/2008	Pending
34917.10	OBS #1	Observation Well #1	TSS	W	11/19/2008	Pending
34918.00	Intake	HBDIC Intake	NO3-N	W	11/19/2008	Pending
34918.00	Intake	HBDIC Intake	Cl	W	11/19/2008	Pending
34918.00	Intake	HBDIC Intake	TDS	W	11/19/2008	Pending
34918.00	Intake	HBDIC Intake	P04-P	W	11/19/2008	Pending
34918.00	Intake	HBDIC Intake	525.Walla	W	11/19/2008	Pending
34918.10	Intake	HBDIC Intake	531	W	11/19/2008	Pending
34918.10	Intake	HBDIC Intake	515	W	11/19/2008	Pending
34918.10	Intake	HBDIC Intake	TKN	W	11/19/2008	Pending
34918.10	Intake	HBDIC Intake	COD	W	11/19/2008	Pending
34918.10	Intake	HBDIC Intake	TOC	W	11/19/2008	Pending
34918.10	Intake	HBDIC Intake	TSS	W	11/19/2008	Pending
34918.10		Shipping Charge	SHIPPING	NA		Completed

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

Data Report

Client Name: Walla Walla Basin Watershed Council
810 S Main Street
Milton-Freewater, OR 97862

Reference Number: **08-16537**
Project: HBDIC Recharge Project
Report Date: 12/2/08
Date Received: 11/20/08
Peer Review:

Sample Description: OBS #1 - Observation Well #1
Lab Number: 34917
Sample Date: 11/19/08
Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
14797-55-8	**NITRATE-N**	0.16	0.100	0.015	mg/L	1	300.0	11/20/08	BJ	I081120A	
16887-00-6	**CHLORIDE**	0.6	0.1	0.012	mg/L	1	300.0	11/20/08	BJ	I081120A	
E-10173	**TOTAL DISSOLVED SOLIDS**	61	10	6	mg/L	1	SM2540 C	11/25/08	CCN	TDS_081125	
14265-44-2	**ORTHO-PHOSPHATE**	0.13	0.01	0.002	mg/L	1	SM4500-P F	11/20/08	SO	OPHOS-081120	
E-10264	**TOTAL KJELDAHL NITROGEN**	0.22	0.2	0.0486	mg/L	1	SM4500-Norg C	11/21/08	SO	TKN-081121	
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.55	mg/L	1	SM2540 D	11/24/08	MAK	TSS_081124	
E-10195	**TOTAL ORGANIC CARBON**	0.91	0.50	0.0981	mg/L	1	SM5310 B	11/25/08	BJ	TOC_081125	
-10117	**CHEMICAL OXYGEN DEMAND**	ND	8	2	mg/L	1	SM5220 D	11/26/08	MAK	COD_081126	

Sample Description: Intake - HBDIC Intake
Lab Number: 34918
Sample Date: 11/19/08
Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
14797-55-8	**NITRATE-N**	ND	0.100	0.015	mg/L	1	300.0	11/20/08	BJ	I081120A	
16887-00-6	**CHLORIDE**	0.6	0.1	0.012	mg/L	1	300.0	11/20/08	BJ	I081120A	
E-10173	**TOTAL DISSOLVED SOLIDS**	56	10	6	mg/L	1	SM2540 C	11/25/08	CCN	TDS_081125	
14265-44-2	**ORTHO-PHOSPHATE**	0.11	0.01	0.002	mg/L	1	SM4500-P F	11/20/08	SO	OPHOS-081120	
E-10264	**TOTAL KJELDAHL NITROGEN**	0.24	0.2	0.0486	mg/L	1	SM4500-Norg C	11/21/08	SO	TKN-081121	
E-10162	**TOTAL SUSPENDED SOLIDS**	8	4	1.55	mg/L	1	SM2540 D	11/24/08	MAK	TSS_081124	
E-10195	**TOTAL ORGANIC CARBON**	0.90	0.50	0.0981	mg/L	1	SM5310 B	11/25/08	BJ	TOC_081125	
E-10117	**CHEMICAL OXYGEN DEMAND**	ND	8	2	mg/L	1	SM5220 D	11/26/08	MAK	COD_081126	

Notes:
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershe
810 S Main Street
Milton-Freewater, OR 97862

Project::
Field ID: OBS #1
Sample Description: Observation Well #1
Sampled By: Unknown
Sample Date: 11/19/08
Source Type:
Sampler Phone:

Reference Number: 08-16537
Project: HBDIC Recharge Project

Lab Number: 046-34917
Report Date: 12/5/08
Date Analyzed: 12/04/08
Date Extracted: 515_081201
Analyst: CO
Peer Review: TM
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
94-75-7	2,4 - D	**ND**	ug/L	0.2	0.11	70	HBDIC TARGET
93-72-1	2,4,5 - TP (SILVEX)	**ND**	ug/L	0.1	0.02	50	
[illegible]-5	PENTACHLOROPHENOL	**ND**	ug/L	0.1	0.044	1	
7[illegible]-0	DALAPON	**ND**	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	**ND**	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	**ND**	ug/L	0.1	0.089	500	
EPA Unregulated							
1918-00-9	DICAMBA	**ND**	ug/L	0.1	0.045		
State Unregulated							
1861-32-1	TOTAL (DCPA & Metabolites)	**ND**	ug/L	0.1	0.089		
E-14028	DCPA (ACID METABOLITES)	**ND**	ug/L	0.1	0.1		
94-82-6	2,4 DB	**ND**	ug/L	0.8	0.10		
93-76-5	2,4,5 T	**ND**	ug/L	0.1	0.044		
25057-89-0	BENTAZON	**ND**	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	**ND**	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	**ND**	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	**ND**	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	**ND**	ug/L	0.1	0.044		

N[illegible]:
If a [illegible]pound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

If you have any questions concerning this report contact at the above phone number.

FORM: SOC_gen.rpt

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

HERBICIDES IN DRINKING WATER

Client Name: Walla Walla Basin Watershe
810 S Main Street
Milton-Freewater, OR 97862

Project::
Field ID: Intake
Sample Description: HBDIC Intake
Sampled By: Unknown
Sample Date: 11/19/08
Source Type:
Sampler Phone:

Reference Number: 08-16537
Project: HBDIC Recharge Project

Lab Number: 046-34918
Report Date: 12/5/08
Date Analyzed: 12/04/08
Date Extracted: 515_081201
Analyst: CO
Peer Review:
Analytical Method: 515.1
Chlorophenoxy Herbicides

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
94-75-7	2,4 - D	ND	ug/L	0.2	0.11	70	HBDIC TARGET
93-72-1	2,4,5 - TP (SILVEX)	ND	ug/L	0.1	0.02	50	
[illegible]-5	PENTACHLOROPHENOL	ND	ug/L	0.1	0.044	1	
[illegible]-0	DALAPON	ND	ug/L	1.3	0.80	200	
88-85-7	DINOSEB	ND	ug/L	0.2	0.16	7	
1918-02-1	PICLORAM	ND	ug/L	0.1	0.089	500	
EPA Unregulated							
1918-00-9	DICAMBA	ND	ug/L	0.1	0.045		
State Unregulated							
1861-32-1	TOTAL (DCPA & Metabolites)	ND	ug/L	0.1	0.089		
E-14028	DCPA (ACID METABOLITES)	ND	ug/L	0.1	0.1		
94-82-6	2,4 DB	ND	ug/L	0.8	0.10		
93-76-5	2,4,5 T	ND	ug/L	0.1	0.044		
25057-89-0	BENTAZON	ND	ug/L	0.2	0.067		
120-36-5	DICHLORPROP	ND	ug/L	0.3	0.089		
50594-66-6	ACIFLUORFEN	ND	ug/L	0.1	0.089		
133-90-4	CHLORAMBEN	ND	ug/L	0.2	0.2		
51-36-5	3,5 - DICHLOROBENZOIC ACID	ND	ug/L	0.1	0.044		

[illegible]:
If a [illegible]mpound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershe
810 S Main Street
Milton-Freewater, OR 97862

Project::
Field ID: OBS #1
Sample Description: Observation Well #1
Sampled By: Unknown
Sample Date: 11/19/08
Source Type:
Sampler Phone:

Reference Number: 08-16537
Project: HBDIC Recharge Project

Lab Number: 046-34917
Report Date: 11/25/08
Date Analyzed: 11/19/08
Date Extracted: 531_081119
Analyst: CO
Peer Review:
Analytical Method: 531.2
Carbamates

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.3	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.2	40	
EPA Unregulated							
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.3		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.3		
2-77-5	METHOMYL	**ND**	ug/L	1.0	0.3		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	0.3		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.3		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.2		
State Unregulated - Other							
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.4		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.3		

If ...pound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
ND (Not Detected): indicates that the parameter was not detected above the State Reporting Limit (SRL).

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CARBAMATES IN DRINKING WATER

Client Name: Walla Walla Basin Watershe
810 S Main Street
Milton-Freewater, OR 97862

Project::
Field ID: Intake
Sample Description: HBDIC Intake
Sampled By: Unknown
Sample Date: 11/19/08
Source Type:
Sampler Phone:

Reference Number: 08-16537
Project: HBDIC Recharge Project

Lab Number: 046-34918
Report Date: 11/25/08
Date Analyzed: 11/19/08
Date Extracted: 531_081119
Analyst: CO
Peer Review: Dan
Analytical Method: 531.2
Carbamates

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
EPA Regulated							
23135-22-0	OXYMAL	**ND**	ug/L	1.0	0.3	200	
1563-66-2	CARBOFURAN	**ND**	ug/L	1.0	0.2	40	
EPA Unregulated							
1646-87-3	ALDICARB SULFOXIDE	**ND**	ug/L	1.0	0.3		
1646-88-4	ALDICARB SULFONE	**ND**	ug/L	1.0	0.3		
2-77-5	METHOMYL	**ND**	ug/L	1.0	0.3		
16655-82-6	3-HYDROXYCARBOFURAN	**ND**	ug/L	1.0	0.3		
116-06-3	ALDICARB	**ND**	ug/L	1.0	0.3		
63-25-2	CARBARYL	**ND**	ug/L	1.0	0.2		
State Unregulated - Other							
114-26-1	PROPOXUR (BAYGON)	**ND**	ug/L	1.0	0.4		
2032-65-7	METHIOCARB	**ND**	ug/L	1.0	0.3		

If ... pound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershe
810 S Main Street
Milton-Freewater, OR 97862

Project::
Field ID: OBS #1
Sample Description: Observation Well #1
Sampled By: Unknown
Sample Date: 11/19/08
Source Type:
Sampler Phone:

Reference Number: 08-16537
Project: HBDIC Recharge Project

Lab Number: 046-34917
Report Date: 12/10/08
Date Analyzed: 12/01/08
Date Extracted: 525X_081125
Analyst: CO
Peer Review:
Analytical Method: 525.2
SOC for Walla Walla

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
2312-35-8	PROPARGITE	ND	ug/L	0.5	-		
[illegible]-7	BISPHENOL-A	ND	ug/L	1	-		
60-51-5	DIMETHOATE	ND	ug/L	0.5	0.03		
57837-19-1	METALAXYL	ND	ug/L	0.1	-		
15299-99-7	NAPROPAMIDE	ND	ug/L	0.1	0.05		
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
86-86-2	1-NAPHTHALENEACETAMIDE	ND	ug/L	0.5	-		
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		
60168-88-9	FENARIMOL	ND	ug/L	0.1	0.03		
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
7786-34-7	MEVINPHOS	ND	ug/l	0.1	0.03		
86-50-0	AZINPHOS-METHYL	ND	ug/L	0.5	0.12		
2921-88-2	CHLORPYRIFOS	ND	ug/L	0.1	0.04		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
115-32-2	DICOFOL	ND	ug/L	1	-		
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
298-00-0	METHYL PARATHION	ND	ug/L	0.5	0.1		
56-38-2	PARATHION-ETHYL	ND	ug/L	0.1	0.022		
732-11-6	PHOSMET	ND	ug/L	0.5	-		
43121-43-3	TRIADIMEFON	ND	ug/L	0.1	0.07		
68694-11-1	TRIFLUMIZOLE	ND	ug/L	1.0	1.0		
950-37-8	METHIDATHINON	ND	ug/L	0.5	0.5		

[illegible]:
If [illegible]ound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
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FORM: SOC_gen.rpt

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
88671-89-0	MYCLOBUTANIL	**ND**	ug/L	0.5	0.5		
51235-04-2	HEXAZINONE	**ND**	ug/L	0.1	0.05		

If [illegible]ound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
Trigger Level: DOH Drinking Water Response level. Systems with compounds detected in excess of this level are required to take additional samples. Contact your regional DOH office.
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Microbiology | 360.671.0688 • 360.671.1577fax

SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

Client Name: Walla Walla Basin Watershe
810 S Main Street
Milton-Freewater, OR 97862

Project::
Field ID: Intake
Sample Description: HBDIC Intake
Sampled By: Unknown
Sample Date: 11/19/08
Source Type:
Sampler Phone:

Reference Number: 08-16537
Project: HBDIC Recharge Project

Lab Number: 046-34918
Report Date: 12/10/08
Date Analyzed: 12/01/08
Date Extracted: 525X_081125
Analyst: CO
Peer Review:
Analytical Method: 525.2
SOC for Walla Walla

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
2312-35-8	PROPARGITE	ND	ug/L	0.5	-		
-7	BISPHENOL-A	ND	ug/L	1	-		
60-51-5	DIMETHOATE	ND	ug/L	0.5	0.03		
57837-19-1	METALAXYL	ND	ug/L	0.1	-		
15299-99-7	NAPROPAMIDE	ND	ug/L	0.1	0.05		
122-34-9	SIMAZINE	ND	ug/L	0.1	0.030	4	
86-86-2	1-NAPHTHALENEACETAMIDE	ND	ug/L	0.5	-		
333-41-5	DIAZINON	ND	ug/L	0.1	0.035		
60168-88-9	FENARIMOL	ND	ug/L	0.1	0.03		
58-89-9	LINDANE (BHC - GAMMA)	ND	ug/L	0.1	0.028	0.2	
7786-34-7	MEVINPHOS	ND	ug/l	0.1	0.03		
86-50-0	AZINPHOS-METHYL	ND	ug/L	0.5	0.12		
2921-88-2	CHLORPYRIFOS	ND	ug/L	0.1	0.04		
72-54-8	4,4-DDD	ND	ug/L	0.1	0.024		
72-55-9	4,4-DDE	ND	ug/L	0.1	0.024		
50-29-3	4,4-DDT	ND	ug/L	0.1	0.022		
115-32-2	DICOFOL	ND	ug/L	1	-		
121-75-5	MALATHION	ND	ug/L	0.1	0.015		
298-00-0	METHYL PARATHION	ND	ug/L	0.5	0.1		
56-38-2	PARATHION-ETHYL	ND	ug/L	0.1	0.022		
732-11-6	PHOSMET	ND	ug/L	0.5	-		
43121-43-3	TRIADIMEFON	ND	ug/L	0.1	0.07		
68694-11-1	TRIFLUMIZOLE	ND	ug/L	1.0	1.0		
950-37-8	METHIDATHINON	ND	ug/L	0.5	0.5		

If pound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
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SYNTHETIC ORGANIC COMPOUNDS (SOC) REPORT

CAS	COMPOUND	RESULTS	UNITS	PQL	MDL	MCL	COMMENT
88671-89-0	MYCLOBUTANIL	**ND**	ug/L	0.5	0.5		
51235-04-2	HEXAZINONE	**ND**	ug/L	0.1	0.05		

!
If ound is detected > or = to the State Reporting Level, SRL, specified increased monitoring frequencies may occur per DOH.
MCL (Maximum Contaminant Level) maximum permissible level of a contaminant in water established by EPA; Federal Action Levels are 0.015 mg/L for Lead and 1.3 mg/L for Copper. Sodium has a recommended limit of 20 mg/L. A blank MCL value indicates a level is not currently established.
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Bellingham WA Microbiology | 805 Orchard Dr Suite 4 - 98225
360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
515_081201	2,4 - D	2.04	2	ug/L	515.1	102	70-130		LFB	
	2,4 - DCAA (SURR)	102		%	515.1		70-130			
	2,4 DB	6.1	8	ug/L	515.1	76	70-130			
	2,4,5 - TP (SILVEX)	1.08	1	ug/L	515.1	108	70-130			
	2,4,5 T	1.01	1	ug/L	515.1	101	70-130			
	ACIFLUORFEN	0.89	1	ug/L	515.1	89	70-130			
	BENTAZON	1.73	2	ug/L	515.1	87	70-130			
	CHLORAMBEN	0.88	1	ug/L	515.1	88	70-130			
	DALAPON	12.7	13	ug/L	515.1	98	70-130			
	DCPA (ACID METABOLITES)	1.39	1	ug/L	515.1	139	70-130	HQ		
	DICAMBA	1.12	1	ug/L	515.1	112	70-130			
	DICHLORPROP	3.27	3	ug/L	515.1	109	70-130			
	DINOSEB	2.08	2	ug/L	515.1	104	70-130			
	PENTACHLOROPHENOL	1.09	1	ug/L	515.1	109	70-130			
	PICLORAM	1.02	1	ug/L	515.1	102	70-130			
	TOTAL (DCPA & Metabolites)	1.39	1	ug/L	515.1	139	70-130	HQ		
525_081125	1,3-DIMETHYL-2-NITROBENZENE (Surr)	96		%	525.2		70-130		LFB	
	4,4-DDD	1.11	1	ug/L	525.2	111	70-130			
	4,4-DDE	1.13	1	ug/L	525.2	113	70-130			
	4,4-DDT	1.15	1	ug/L	525.2	115	70-130			
	BISPHENOL-A	4.3	5	ug/L	525.2	86	85-115			
	DIAZINON	1.91	2	ug/L	525.2	96	70-130			
	LINDANE (BHC - GAMMA)	0.81	1	ug/L	525.2	81	70-130			
	MALATHION	2.45	2	ug/L	525.2	123	70-130			
	PERYLENE-D12 (Surr)	95		%	525.2		70-130			
	PYRENE-D10 (Surr)	89		%	525.2		70-130			
	SIMAZINE	1.16	1	ug/L	525.2	116	70-130			
	TRIPHENYLPHOSPHATE (Surr)	112		%	525.2		70-130			
525X_081125	1-NAPHTHALENEACETAMIDE	1.95	2	ug/L	525.2	98	70-130		LFB	
	CHLORPYRIFOS	2.09	2	ug/L	525.2	105	70-130			
	DICOFOL	2.72	2	ug/L	525.2	136	70-130			
	DIMETHOATE	0.63	1	ug/L	525.2	63	70-130	N1		

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

= Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525X_081125	FENARIMOL	1.39	1	ug/L	525.2	139	70-130	HQ	LFB	
	HEXAZINONE	1.23	1	ug/L	525.2	123	70-130			
	MALATHION	2.94	3	ug/L	525.2	98	70-130			
	METALAXYL	2.06	2	ug/L	525.2	103	70-130			
	METHIDATHINON	3	2	ug/L	525.2	150	85-115	HR		
	MEVINPHOS	1.07	1	ug/L	525.2	107	70-130			
	MYCLOBUTANIL	2.27	2	ug/L	525.2	114	85-115			
	NAPROPAMIDE	1.12	1	ug/L	525.2	112	70-130			
	PARATHION-ETHYL	2.16	2	ug/L	525.2	108	70-130			
	PHOSMET	2.64	2	ug/L	525.2	132	70-130	HR		
	PROPARGITE	2.05	2	ug/L	525.2	103	85-115			
	TRIADIMEFON	1.14	1	ug/L	525.2	114	70-130			
	TRIFLUMIZOLE	1.91	2	ug/L	525.2	96	85-115			
531_081119	BDMC (SURR)	108		%	531.2		70-130		LFB	
531_081119	3-HYDROXYCARBOFURAN	50	50	ug/L	531.2	100	70-130		LFB	
	ALDICARB	50	50	ug/L	531.2	100	70-130			
	ALDICARB SULFONE	49.9	50	ug/L	531.2	100	70-130			
	ALDICARB SULFOXIDE	49.5	50	ug/L	531.2	99	70-130			
	BDMC (SURR)	100		%	531.2		70-130			
	CARBARYL	48.5	50	ug/L	531.2	97	70-130			
	CARBOFURAN	46.4	50	ug/L	531.2	93	70-130			
	METHIOCARB	46	50	ug/L	531.2	92	70-130			
	METHOMYL	50.3	50	ug/L	531.2	101	70-130			
	OXYMAL	50	50	ug/L	531.2	100	70-130			
	PROPOXUR (BAYGON)	50.2	50	ug/L	531.2	100	70-130			
531_081119	3-HYDROXYCARBOFURAN	10.5	10	ug/L	531.2	105	70-130		LFB	
	ALDICARB	10.6	10	ug/L	531.2	106	70-130			
	ALDICARB SULFONE	10.9	10	ug/L	531.2	109	70-130			
	ALDICARB SULFOXIDE	10.7	10	ug/L	531.2	107	70-130			
	BDMC (SURR)	101		%	531.2		70-130			
	CARBARYL	10.3	10	ug/L	531.2	103	70-130			
	CARBOFURAN	10.1	10	ug/L	531.2	101	70-130			
	METHIOCARB	10.2	10	ug/L	531.2	102	70-130			

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

= Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_081119	METHOMYL	11.2	10	ug/L	531.2	112	70-130		LFB	
	OXYMAL	10.6	10	ug/L	531.2	106	70-130			
	PROPOXUR (BAYGON)	10.5	10	ug/L	531.2	105	70-130			
COD_081126	CHEMICAL OXYGEN DEMAND	48	50	mg/L	SM5220 D	96	80-120		LFB	
OPHOS-081120	ORTHO-PHOSPHATE	1.02	1.00	mg/L	SM4500-P F	102	70-130		LFB	
tds_081125	TOTAL DISSOLVED SOLIDS	482	500	mg/L	SM2540 C	96	80-120		LFB	
tds_081125	TOTAL DISSOLVED SOLIDS	482	500	mg/L	SM2540 C	96	80-120		LFB	
TKN-081121	TOTAL KJELDAHL NITROGEN	4.20	4.00	mg/L	SM4500-Norg C	105	80-120		LFB	
TSS_081124	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	
TSS_081124	TOTAL SUSPENDED SOLIDS	490	500	mg/L	SM2540 D	98	80-120		LFB	

*Notation:

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= Indicates % Recovery could not be calculated.

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Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Low Level Laboratory Fortified Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_081119	3-HYDROXYCARBOFURAN	0.96	1	ug/L	531.2	96	50-150		LFBD	
	ALDICARB	0.95	1	ug/L	531.2	95	50-150			
	ALDICARB SULFONE	1	1	ug/L	531.2	100	50-150			
	ALDICARB SULFOXIDE	0.99	1	ug/L	531.2	99	50-150			
	CARBARYL	1	1	ug/L	531.2	100	50-150			
	CARBOFURAN	1.2	1	ug/L	531.2	120	50-150			
	METHIOCARB	1.2	1	ug/L	531.2	120	50-150			
	METHOMYL	0.94	1	ug/L	531.2	94	50-150			
	OXYMAL	0.95	1	ug/L	531.2	95	50-150			
	PROPOXUR (BAYGON)	0.91	1	ug/L	531.2	91	50-150			

*Notation:

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Reagent Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
COD_081126	CHEMICAL OXYGEN DEMAND	ND		mg/L	SM5220 D		4.00000		LRB	
I081120A	CHLORIDE	ND		mg/L	300.0		0.10000		LRB	
	NITRATE-N	ND		mg/L	300.0		0.10000			
OPHOS-081120	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		LRB	
TKN-081121	TOTAL KJELDAHL NITROGEN	ND		mg/L	SM4500-Norg C		1.00000		LRB	

*Notation:

Recovery = (Result of Analysis)/(True Value) * 100

N/A = Indicates % Recovery could not be calculated.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
515_081201	2,4 - D	ND		ug/L	515.1		0.05000		MB	
	2,4 - DCAA (SURR)	99		%	515.1					
	2,4 DB	ND		ug/L	515.1		0.25000			
	2,4,5 - TP (SILVEX)	ND		ug/L	515.1		0.10000			
	2,4,5 T	ND		ug/L	515.1		0.10000			
	ACIFLUORFEN	ND		ug/L	515.1		0.50000			
	BENTAZON	ND		ug/L	515.1		0.12000			
	CHLORAMBEN	ND		ug/L	515.1		0.20000			
	DALAPON	ND		ug/L	515.1		0.50000			
	DCPA (ACID METABOLITES)	ND		ug/L	515.1		0.10000			
	DICAMBA	ND		ug/L	515.1		0.05000			
	DICHLORPROP	ND		ug/L	515.1		0.12000			
	DINOSEB	ND		ug/L	515.1		0.10000			
	PENTACHLOROPHENOL	ND		ug/L	515.1		0.02000			
	PICLORAM	ND		ug/L	515.1		0.05000			
	TOTAL (DCPA & Metabolites)	ND		ug/L	515.1		0.02000			
525_081125	1,3-DIMETHYL-2-NITROBENZENE (Surr)	96		%	525.2				MB	
	4,4-DDD	ND		ug/L	525.2		0.05000			
	4,4-DDE	ND		ug/L	525.2		0.05000			
	4,4-DDT	ND		ug/L	525.2		0.05000			
	BISPHENOL-A	ND		ug/L	525.2		1.00000			
	DIAZINON	ND		ug/L	525.2		0.05000			
	LINDANE (BHC - GAMMA)	ND		ug/L	525.2		0.02000			
	MALATHION	ND		ug/L	525.2		0.05000			
	PERYLENE-D12 (Surr)	97		%	525.2					
	PYRENE-D10 (Surr)	93		%	525.2					
	SIMAZINE	ND		ug/L	525.2		0.02000			
	TRIPHENYLPHOSPHATE (Surr)	109		%	525.2					
525X_081125	1-NAPHTHALENEACETAMIDE	ND		ug/L	525.2		0.10000		MB	
	AZINPHOS-METHYL	ND		ug/L	525.2		0.00000			
	CHLORPYRIFOS	ND		ug/L	525.2		0.00000			
	DICOFOL	ND		ug/L	525.2		0.00000			

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
525X_081125	DIMETHOATE	ND		ug/L	525.2		0.00000		MB	
	FENARIMOL	ND		ug/L	525.2		0.00000			
	HEXAZINONE	ND		ug/L	525.2		0.00000			
	MALATHION	ND		ug/L	525.2		0.05000			
	METALAXYL	ND		ug/L	525.2		0.10000			
	METHIDATHINON	ND		ug/L	525.2		0.50000			
	METHYL PARATHION	ND		ug/L	525.2		0.00000			
	MEVINPHOS	ND		ug/L	525.2		0.00000			
	MYCLOBUTANIL	ND		ug/L	525.2		0.50000			
	NAPROPAMIDE	ND		ug/L	525.2		0.00000			
	PARATHION-ETHYL	ND		ug/L	525.2		0.05000			
	PHOSMET	ND		ug/L	525.2		0.10000			
	PROPARGITE	ND		ug/L	525.2		0.00000			
	TRIADIMEFON	ND		ug/L	525.2		0.00000			
	TRIFLUMIZOLE	ND		ug/L	525.2		1.00000			
531_081119	3-HYDROXYCARBOFURAN	ND		ug/L	531.2		0.50000		MB	
	ALDICARB	ND		ug/L	531.2		0.25000			
	ALDICARB SULFONE	ND		ug/L	531.2		0.40000			
	ALDICARB SULFOXIDE	ND		ug/L	531.2		0.25000			
	BDMC (SURR)	98		%	531.2		0.00000			
	CARBARYL	ND		ug/L	531.2		0.50000			
	CARBOFURAN	ND		ug/L	531.2		0.45000			
	METHIOCARB	ND		ug/L	531.2		1.00000			
	METHOMYL	ND		ug/L	531.2		0.25000			
	OXYMAL	ND		ug/L	531.2		1.00000			
	PROPOXUR (BAYGON)	ND		ug/L	531.2		0.25000			
OPHOS-081120	ORTHO-PHOSPHATE	ND		mg/L	SM4500-P F		0.10000		MB	
tds_081125	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	
tds_081125	TOTAL DISSOLVED SOLIDS	ND		mg/L	SM2540 C		2.50000		MB	

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FORM: QC Independent

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TKN-081121	TOTAL KJELDAHL NITROGEN	ND		mg/L	SM4500-Norg C		0.12000		MB	
TSS_081124	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_081124	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
531_081119	3-HYDROXYCARBOFURAN	26.9	26.9	ug/L	531.2	100	70-130		QCS	
	ALDICARB	25.6	27.9	ug/L	531.2	92	70-130			
	ALDICARB SULFONE	37	38.5	ug/L	531.2	96	70-130			
	ALDICARB SULFOXIDE	21	28.8	ug/L	531.2	73	70-130			
	BDMC (SURR)	122		%	531.2		70-130			
	CARBARYL	83.9	90.1	ug/L	531.2	93	70-130			
	CARBOFURAN	123	136	ug/L	531.2	90	70-130			
	METHIOCARB	33.9	34.7	ug/L	531.2	98	70-130			
	METHOMYL	81.3	78.3	ug/L	531.2	104	70-130			
	OXYMAL	33.4	32.5	ug/L	531.2	103	70-130			
	PROPOXUR (BAYGON)	31.2	30.1	ug/L	531.2	104	70-130			
531_081119	3-HYDROXYCARBOFURAN	46.8	50	ug/L	531.2	94	70-130		QCS	
	ALDICARB	50.4	50	ug/L	531.2	101	70-130			
	ALDICARB SULFONE	50.2	50	ug/L	531.2	100	70-130			
	ALDICARB SULFOXIDE	53.2	50	ug/L	531.2	106	70-130			
	BDMC (SURR)	112		%	531.2		70-130			
	CARBARYL	46.5	50	ug/L	531.2	93	70-130			
	CARBOFURAN	48.7	50	ug/L	531.2	97	70-130			
	METHIOCARB	48.9	50	ug/L	531.2	98	70-130			
	METHOMYL	51.7	50	ug/L	531.2	103	70-130			
	OXYMAL	50	50	ug/L	531.2	100	70-130			
	PROPOXUR (BAYGON)	51	50	ug/L	531.2	102	70-130			
COD_081126	CHEMICAL OXYGEN DEMAND	91	92	mg/L	SM5220 D	99	80-120		QCS	
I081120A	CHLORIDE	28.3	30.0	mg/L	300.0	94	80-120		QCS	
	NITRATE-N	2.42	2.50	mg/L	300.0	97	80-120			
OPHOS-081120	ORTHO-PHOSPHATE	0.49	0.49	mg/L	SM4500-P F	100	70-130		QCS	
TKN-081121	TOTAL KJELDAHL NITROGEN	5.02	4.77	mg/L	SM4500-Norg C	105	80-120		QCS	

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Quality Control Sample

Reference Number: 08-16537
Report Date: 12/10/08

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment

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QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 08-16537

Report Date: 12/10/2008

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
515_081201									
	34917	2,4 - DCAA (SURR)	103	105	%	**1.9**	0-45		DUP
525_081125									
	34807	1,3-DIMETHYL-2-NITROBENZENE (Surr	96	96	%	**0.0**	0-45		DUP
	34807	PYRENE-D10 (Surr)	93	92	%	**1.1**	0-45		DUP
	34807	PERYLENE-D12 (Surr)	99	96	%	**3.1**	0-45		DUP
	34807	TRIPHENYLPHOSPHATE (Surr)	106	108	%	**1.9**	0-45		DUP
531_081119									
	32550	OXYMAL	55.7	59.4	ug/L	**6.4**	0-45		DUP
	32550	CARBOFURAN	62.9	67.2	ug/L	**6.6**	0-45		DUP
	32550	ALDICARB SULFOXIDE	42.2	44.6	ug/L	**5.5**	0-45		DUP
	32550	ALDICARB SULFONE	40.3	43.2	ug/L	**6.9**	0-45		DUP
	32550	METHOMYL	61.7	65.8	ug/L	**6.4**	0-45		DUP
	32550	3-HYDROXYCARBOFURAN	41.9	42.6	ug/L	**1.7**	0-45		DUP
	32550	ALDICARB	37.7	40.2	ug/L	**6.4**	0-45		DUP
	32550	CARBARYL	44.8	48.4	ug/L	**7.7**	0-45		DUP
	32550	PROPOXUR (BAYGON)	101	107	ug/L	**5.8**	0-45		DUP
	32550	METHIOCARB	123	131	ug/L	**6.3**	0-45		DUP
	32550	BDMC (SURR)	95	103	Area	**8.1**	0-45		DUP
COD_081126									
	35364	CHEMICAL OXYGEN DEMAND	8200	8550	mg/L	**4.2**	0-45		DUP
I081120A									
	34897	NITRATE-N	2.5	2.5	mg/L	**0.0**	0-45		DUP
	34897	CHLORIDE	63	63	mg/L	**0.0**	0-45		DUP
	34918	CHLORIDE	0.6	0.5	mg/L	**18.2**	0-45		DUP
OPHOS-081120									
	34918	ORTHO-PHOSPHATE	0.11	0.11	mg/L	**0.0**	0-50		DUP

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
TDS_081125									
	35236	TOTAL DISSOLVED SOLIDS	382	379	mg/L	**0.8**	0-45	DUP	
TKN-081121									
	34471	TOTAL KJELDAHL NITROGEN	11.4	11.4	mg/L	**0.0**	0-45	DUP	
TSS_081124									
	35097	TOTAL SUSPENDED SOLIDS	19	23	mg/L	**19.0**	0-45	DUP	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

EDGE ANALYTICAL LABORATORIES QA

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
515_081201														
	34807	2,4 - D	ND	1.87		2	ug/L	**94**	**NA**	65-135	**NA**	0-60		LFM
	34807	2,4,5 - TP (SILVEX)	ND	0.99		1	ug/L	**99**	**NA**	65-135	**NA**	0-60		LFM
	34807	PENTACHLOROPHENOL	ND	0.99		1	ug/L	**99**	**NA**	65-135	**NA**	0-60		LFM
	34807	DALAPON	ND	11.1		13	ug/L	**85**	**NA**	65-135	**NA**	0-60		LFM
	34807	DINOSEB	ND	1.99		2	ug/L	**100**	**NA**	65-135	**NA**	0-60		LFM
	34807	PICLORAM	ND	0.91		1	ug/L	**91**	**NA**	65-135	**NA**	0-60		LFM
	34807	DICAMBA	ND	1		1	ug/L	**100**	**NA**	65-135	**NA**	0-60		LFM
	34807	TOTAL (DCPA & Metabolites)	ND	1.28		1	ug/L	**128**	**NA**	65-135	**NA**	0-60		LFM
	34807	2,4 DB	ND	6.29		8	ug/L	**79**	**NA**	65-135	**NA**	0-60		LFM
	34807	2,4,5 T	ND	0.93		1	ug/L	**93**	**NA**	65-135	**NA**	0-60		LFM
	34807	BENTAZON	ND	1.57		2	ug/L	**79**	**NA**	65-135	**NA**	0-60		LFM
	34807	DICHLORPROP	ND	3.06		3	ug/L	**102**	**NA**	65-135	**NA**	0-60		LFM
	34807	ACIFLUORFEN	ND	0.84		1	ug/L	**84**	**NA**	65-135	**NA**	0-60		LFM
	34807	CHLORAMBEN	ND	0.85		1	ug/L	**85**	**NA**	65-135	**NA**	0-50		LFM
	34807	2,4 - DCAA (SURR)	96	93			%		**NA**	70-130	**NA**	0-60		LFM
525_081125														
	34405	BISPHENOL-A	ND	3.1		5	ug/L	**62**	**NA**	70-130	**NA**	0-50	ME	LFM
	34405	SIMAZINE	ND	0.94		1	ug/L	**94**	**NA**	70-130	**NA**	0-60		LFM
	34405	DIAZINON	ND	1.93		1	ug/L	**193**	**NA**	70-130	**NA**	0-60		LFM
	34405	LINDANE (BHC - GAMMA)	ND	0.91		1	ug/L	**91**	**NA**	70-130	**NA**	0-60		LFM
	34405	4,4-DDD	ND	0.95		1	ug/L	**95**	**NA**	70-130	**NA**	0-60		LFM
	34405	4,4-DDE	ND	0.87		1	ug/L	**87**	**NA**	70-130	**NA**	0-60		LFM
	34405	4,4-DDT	ND	0.93		1	ug/L	**93**	**NA**	70-130	**NA**	0-60		LFM
	34405	MALATHION	ND	2.09		2	ug/L	**105**	**NA**	70-130	**NA**	0-60		LFM
	34405	PARATHION-ETHYL	ND	1.96		2	ug/L	**98**	**NA**	70-130	**NA**	0-60		LFM
525X_081125														
	34405	PROPARGITE	ND	2.18		2	ug/L	**109**	**NA**	70-130	**NA**	0-50		LFM
	34405	DIMETHOATE	ND	0.62		1	ug/L	**62**	**NA**	70-130	**NA**	0-50	N1	LFM
	34405	METALAXYL	ND	1.93		2	ug/L	**97**	**NA**	70-130	**NA**	0-50		LFM
	34405	NAPROPAMIDE	ND	1.04		1	ug/L	**104**	**NA**	70-130	**NA**	0-50		LFM
	34405	1-NAPHTHALENEACETAMIDE	ND	1.86		2	ug/L	**93**	**NA**	70-130	**NA**	0-50		LFM
	34405	FENARIMOL	ND	1.16		1	ug/L	**116**	**NA**	70-130	**NA**	0-50		LFM
	34405	MEVINPHOS	ND	0.99		1	ug/L	**99**	**NA**	70-130	**NA**	0-50		LFM
	34405	CHLORPYRIFOS	ND	1.91		2	ug/L	**96**	**NA**	70-130	**NA**	0-50		LFM
	34405	DICOFOL	ND	2.62		2	ug/L	**131**	**NA**	70-130	**NA**	0-50	HR	LFM

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

EDGE ANALYTICAL LABORATORIES QA

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
	34405	MALATHION	ND	2.52		3	ug/L	**84**	**NA**	70-130	**NA**	0-60		LFM
	34405	PARATHION-ETHYL	ND	1.74		2	ug/L	**87**	**NA**	70-130	**NA**	0-60		LFM
	34405	PHOSMET	ND	2.26		2	ug/L	**113**	**NA**	70-130	**NA**	0-50		LFM
	34405	TRIADIMEFON	ND	0.96		1	ug/L	**96**	**NA**	70-130	**NA**	0-50		LFM
	34405	TRIFLUMIZOLE	ND	1.62		2	ug/L	**81**	**NA**	70-130	**NA**	0-50		LFM
	34405	METHIDATHINON	ND	2.62		2	ug/L	**131**	**NA**	70-130	**NA**	0-50	HR	LFM
	34405	MYCLOBUTANIL	ND	2.02		2	ug/L	**101**	**NA**	70-130	**NA**	0-50		LFM
	34405	HEXAZINONE	ND	1.09		1	ug/L	**109**	**NA**	70-130	**NA**	0-50		LFM
531_081119														
	33930	OXYMAL	ND	10.5	9.9	10	ug/L	**105**	**99**	70-130	**5.9**	0-50		LFM
	33930	CARBOFURAN	ND	10.2	10.1	10	ug/L	**102**	**101**	70-130	**1.0**	0-50		LFM
	33930	ALDICARB SULFOXIDE	ND	10.4	9.8	10	ug/L	**104**	**98**	70-130	**5.9**	0-50		LFM
	33930	ALDICARB SULFONE	ND	10.8	9.8	10	ug/L	**108**	**98**	70-130	**9.7**	0-50		LFM
	33930	METHOMYL	ND	11	10.1	10	ug/L	**110**	**101**	70-130	**8.5**	0-50		LFM
	33930	3-HYDROXYCARBOFURAN	ND	10.9	10.3	10	ug/L	**109**	**103**	70-130	**5.7**	0-50		LFM
	33930	ALDICARB	ND	10.7	10.3	10	ug/L	**107**	**103**	70-130	**3.8**	0-50		LFM
	33930	CARBARYL	ND	10.5	10.4	10	ug/L	**105**	**104**	70-130	**1.0**	0-50		LFM
	33930	PROPOXUR (BAYGON)	ND	10.9	10.7	10	ug/L	**109**	**107**	70-130	**1.9**	0-50		LFM
	33930	METHIOCARB	ND	10.5	9.3	10	ug/L	**105**	**93**	70-130	**12.1**	0-50		LFM
	33930	BDMC (SURR)	130	100	100		%		**NA**	70-130	**NA**	0-50		LFM
	34917	OXYMAL	ND	2	2.2	2	ug/L	**100**	**110**	70-130	**9.5**	0-50		LFM
	34917	CARBOFURAN	ND	2	2.1	2	ug/L	**100**	**105**	70-130	**4.9**	0-50		LFM
	34917	ALDICARB SULFOXIDE	ND	2.1	2	2	ug/L	**105**	**100**	70-130	**4.9**	0-50		LFM
	34917	ALDICARB SULFONE	ND	2	2.3	2	ug/L	**100**	**115**	70-130	**14.0**	0-50		LFM
	34917	METHOMYL	ND	2	2.2	2	ug/L	**100**	**110**	70-130	**9.5**	0-50		LFM
	34917	3-HYDROXYCARBOFURAN	ND	2	2.05	2	ug/L	**100**	**103**	70-130	**2.5**	0-50		LFM
	34917	ALDICARB	ND	2	2.1	2	ug/L	**100**	**105**	70-130	**4.9**	0-50		LFM
	34917	CARBARYL	ND	2.05	2.2	2	ug/L	**103**	**110**	70-130	**7.1**	0-50		LFM
	34917	PROPOXUR (BAYGON)	ND	2.1	2.2	2	ug/L	**105**	**110**	70-130	**4.7**	0-50		LFM
	34917	METHIOCARB	ND	2	2.5	2	ug/L	**100**	**125**	70-130	**22.2**	0-50		LFM
	34917	BDMC (SURR)	99	89	98		%		**NA**	70-130	**NA**	0-50		LFM
COD_081126														
	35364	CHEMICAL OXYGEN DEMAND	8200	10600	10550	2500	mg/L	**96**	**94**	80-120	**2.1**	0-60		LFM
I081120A														
	34897	NITRATE-N	2.5	3.51		1.00	mg/L	**101**	**NA**	80-120	**NA**	0-60		LFM
	34897	CHLORIDE	63	64		1.00	mg/L	**100**	**NA**	80-120	**NA**	0-60		LFM

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Reference Number: 08-16537
Report Date: 12/10/2008

Matrix Spike

Batch	Sample	Analyte	Result	Spike Result	Duplicate Spike Result	Spike Conc	Units	Percent Recovery MS	Percent Recovery MSD	Limits	%RPD	Limits	QC Qualifier	Comments
	34918	NITRATE-N	ND	19.6		20.00	mg/L	**98**	**NA**	80-120	**NA**	0-60	LFM	
	34918	CHLORIDE	0.6	21		20.00	mg/L	**102**	**NA**	80-120	**NA**	0-60	LFM	
OPHOS-081120														
	34918	ORTHO-PHOSPHATE	0.11	1.18	1.18	1.00	mg/L	**107**	**107**	70-130	**0.0**	0-50	LFM	
TKN-081121														
	34919	TOTAL KJELDAHL NITROGEN	45.2	87.2		40.0	mg/L	**105**		80-120	**NA**	0-60	LFM	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

Qualifier Definitions

Reference Number: 08-16537
Report Date: 12/10/08

Qualifier	Definition
HQ	High QCS recovery due to increased detector response of the sample extract. The continuing calibration checks are within acceptance limits.
HR	High QCS recovery due to increased detector response No sample dectections, therefore, no further action taken for this analysis set.
ME	Matrix spike shows a possible matrix induced bias. The LFB was within acceptance limits, results for this compound are suspect.
N1	Acceptance limits have not been established, the limits listed are for guidance only.

Note: Some qualifier definitions found on this page may pertain to results or QC data which are not printed with this report.

FORM: QualifierDefs

QUALITY CONTROL REPORT
SURROGATE REPORT

Reference Number: 08-16537
Report Date: 12/10/08

Lab No	Analyte	Result	Qualifier	Units	Method	Limit
525_081125						
34917	1,3-DIMETHYL-2-NITROBENZENE (Surr)	96		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	94		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	98		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	108		%		Acceptance Range is 70% to 130%
515_081201						
34917	2,4 - DCAA (SURR)	103		%	515.1	Acceptance Range is 70 - 130%
531_081119						
34917	BDMC (SURR)	99		%	531.2	
525_081125						
34918	1,3-DIMETHYL-2-NITROBENZENE (Surr)	96		%	525.2	Acceptance Range is 70% to 130%
	PYRENE-D10 (Surr)	91		%		Acceptance Range is 70% to 130%
	PERYLENE-D12 (Surr)	100		%		Acceptance Range is 70% to 130%
	TRIPHENYLPHOSPHATE (Surr)	112		%		Acceptance Range is 70% to 130%
515_081201						
34918	2,4 - DCAA (SURR)	100		%	515.1	Acceptance Range is 70 - 130%
531_081119						
[illegible]18	BDMC (SURR)	102		%	531.2	

*Notation:

A surrogate is a pure compound added to a sample in the laboratory just before processing so that the overall efficiency of a method can be determined.

The Acceptance Limits (or Control Limits) approximate a 99% confidence interval around the mean recovery.

Chain of Custody / Analysis Request

(Please complete all applicable shaded sections)

6558

Report to:	Walla Walla Basin Watershed Cour	Bill to:	Same	**For Lab Use Only**	
Ship Address:	810 S Main Street	Address:		Ref #	
City:	Milton-Freewa St: OR Zip: 97862	City:	St: Zip:	**Check Regulatory Program**	
Attn:	Bob Bower	Phone:	FAX:	☐ Safe Drinking Water Act	
Phone:	541.938-2170 FAX:	P.O.#:	Attn:	☐ Clean Water Act	
Email:	bob.bower@wwbwc.org	☐ Visa ☐ M/C ☐ A/E	Expires /	☐ RCRA / CERCLA	
Project	HBDIC Recharge Project	Card#:		☑ Other Recharge	

EDGE ANALYTICAL LABORATORIES
1620 S. Walnut St.
Burlington, WA 98233
1.800.755.9295

805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

Instructions

1. Use one line per sample Location.
2. Be specific in analysis requests.
3. Check off analyses to be performed for each sample Loaction.
4. Enter number of containers.

Turn Around Time Required

☐ Standard
☐ Half-time (50% surcharge)
☐ Quickest (100% surcharge)
☐ Other

Analyses Requested

CO006558

	Field ID	Location	Grab/ Comp.	Sample Matrix*	Date	Time	NO3/Cl/TDS/O-Phos	SOC Package	TKN/COD	TOC	TSS				Number of Containers	Special Instructions Conditions on Receipt
1	OBS #1	Observation Well #1	1	W	11/19/8	11:00	☑	☑	☑	☑	☑	☐	☐	☐		None
2	Intake	HBDIC Intake	1		11/19/8	10:45	☑	☑	☑	☑	☑	☐	☐	☐		None
3							☐	☐	☐	☐	☐	☐	☐	☐		
4							☐	☐	☐	☐	☐	☐	☐	☐		
5							☐	☐	☐	☐	☐	☐	☐	☐		
6							☐	☐	☐	☐	☐	☐	☐	☐		
7							☐	☐	☐	☐	☐	☐	☐	☐		
8							☐	☐	☐	☐	☐	☐	☐	☐		
9							☐	☐	☐	☐	☐	☐	☐	☐		
10							☐	☐	☐	☐	☐	☐	☐	☐		

08-16537
34917 - 34918

Sampled by: Phone: FAX: Email: Total Containers

Sample Receipt Request (Must include FAX or Email) ☐

* **W** - water **SW** - surface water **WW** - waste water **OL** - oil
DW - drinking water **GW** - Ground water **S** - soil Other_____

Relinquished by	Date	Time	Received by	Date	Time
	11/19/8	1:30	UPS — Edge	11/19/8	1:30
			Heather N	11/20/08	8:50

UPS

	Yes	No	N/A
Custody seals intact	☐	☐	☐
Sample temp 3 C satisfactory	☐	☐	☐
Samples received intact	☐	☐	
Chain of custody & labels agree	☐	☐	

08-16537

Mill Creek Water Treatment Plant Laboratory

581 Mill Creek Road Walla Walla, WA 99362

Lab ID # : 143
Washington State ID : M1873
EPA ID # : WA 01177
Telephone : (509) 522-3775
Fax : (509) 529-9681
Date: 11/20/08

System ID / Name: Walla Walla Basin Watershed Council
Amount Due: $75.00

Sampler: Bob Bower
Invoice Number: 8007

Address: P.O. Box 68
Date Collected: 11/19/08

City: Milton-Freewater
Date Analyzed: 11/19/08

State: OR Zip Code: 97874
Lab Analyst: *Skifstad*

Test Methods Are Selected From The
Standard Methods For Examination Of Water and Wastewater ~ 20th Edition~

Test Method 9222D			
Sample ID #1	**Results**	**Units**	**Lab Number**
Intake	19.0	CFU's / 100 mL	143-06246
Sample ID #2	**Results**	**Units**	**Lab Number**
OBS-1A	2.0	CFU's / 100 mL	143-06247
Sample ID #3	**Results**	**Units**	**Lab Number**
OBS-1B	1.0	CFU's / 100 mL	143-06248

The City of Walla Walla's Mill Creek Water Treatment Laboratory will maintain records pertaining to reconstructing client's data for a minimum of five years from the date of issuance of the final report. Records may be destroyed after that .

Signature Lab Director : Tom Krebs 11-20-08 (date)

City Of Walla Walla
Water Plant Laboratory
581 Mill Creek Road
Walla Walla, WA 99362

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

INVOICE

Client No: WAL06

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 SOUTH MAIN STREET
MILTON-FREEWATER, OR 97862

Attn: Bob Bower

Please include this number with payment

Reference: **09-03975**
Date: March 24, 2009
Project: HBDIC Recharge Project
Date Received: March 23, 2009
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	8072.00	LWW-Intake/Head	LWW-Intake/Head	Total Suspended Solids	$19.00
2	8073.00	IG-Intake	IG-Intake 3-20-09	Total Suspended Solids	$19.00
3	8074.00	LWW-Head	LWW-Head 3-16-09	Total Suspended Solids	$19.00
4	8075.00	LWW-Head	LWW-Head 3-19-09	Total Suspended Solids	$19.00
5	8076.00	IG-Intake	IG-Intake 3-18-09	Total Suspended Solids	$19.00
6	8077.00	IG-Intake	IG-Intake 3-18-09 Dup	Total Suspended Solids	$19.00
7	8078.00	IG-Intake	IG-Intake 3-16-09 1350	Total Suspended Solids	$19.00
8	8079.00	LWW-Head	LWW-Head	Total Suspended Solids	$19.00
9	8080.00	IG-Intake	IG-Intake 3-16-09 1355	Total Suspended Solids	$19.00

Grand Total: $171.00
Amount Paid: $0.00
Amount Due: $171.00

Thank You for Your Business

Please pay by April 23, 2009 to avoid a 1.5% per month finance charge.

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

March 23, 2009

Mr. Bob Bower
Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

RE: 09-03975 - HBDIC Recharge Project

Dear Mr. Bob Bower,

Your project: HBDIC Recharge Project, was received on Monday March 23, 2009.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

EDGE ANALYTICAL LABORATORIES

Burlington WA (Corporate Office) | 1620 S Walnut St - 98233
800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA (Microbiology) | 805 Orchard Dr Suite 4 - 98225
360.671.0688 • 360.671.1577fax

Data Report

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Reference Number: **09-03975**
Project: HBDIC Recharge Project
Report Date: 3/23/09
Date Received: 3/23/09
Peer Review: DM

Sample Description: LWW-Intake/Head — Sample Date: 3/19/09
Lab Number: 8072 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	8	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: IG-Intake - IG-Intake 3-20-09 — Sample Date: 3/20/09
Lab Number: 8073 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	9	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: LWW-Head - LWW-Head 3-16-09 — Sample Date: 3/16/09
Lab Number: 8074 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	37	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: LWW-Head - LWW-Head 3-19-09 — Sample Date: 3/19/09
Lab Number: 8075 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	8	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: IG-Intake - IG-Intake 3-18-09 — Sample Date: 3/18/09
Lab Number: 8076 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	8	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: IG-Intake - IG-Intake 3-18-09 Dup — Sample Date: 3/18/09
Lab Number: 8077 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	8	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Notes:
U = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

Reference Number: **09-03975**
Report Date: 3/23/09

Data Report

Sample Description: IG-Intake - IG-Intake 3-16-09 1350 — Sample Date: 3/16/09
Lab Number: 8078 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	27	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: LWW-Head — Sample Date: 3/20/09
Lab Number: 8079 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	7	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

Sample Description: IG-Intake - IG-Intake 3-16-09 1355 — Sample Date: 3/16/09
Lab Number: 8080 — Collected By: Bower

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	15	4	1.68	mg/L	1	SM2540 D	3/23/09	MAK	TSS_090323	

tes:
U = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-03975
Report Date: 03/23/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090323	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	
TSS_090323	TOTAL SUSPENDED SOLIDS	500	500	mg/L	SM2540 D	100	80-120		LFB	
TSS_090323	TOTAL SUSPENDED SOLIDS	500	500	mg/L	SM2540 D	100	80-120		LFB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100
= Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

FORM: QC Independent

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 09-03975
Report Date: 03/23/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090323	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090323	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090323	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

\ = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

FORM: QC Independent

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QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 09-03975

Report Date: 3/23/2009

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
TSS_090323									
	8078	TOTAL SUSPENDED SOLIDS	27	30	mg/L	**10.5**	0-45	DUP	
	8080	TOTAL SUSPENDED SOLIDS	15	18	mg/L	**18.2**	0-45	DUP	

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

09-03975
8072 - 8080

3/23/09

TO EDGE LAB,

This samples for Infiltration Galley testing project. I dont need chain of custody, etc. (All TSS samples)

Samples are:

All samples for HBOIC Recharge Project

Site	Date	Time	Sampler
LWW - Intake/Head	3/19/9	8:34	Bower
IG - Intake	3/20/9	11:50	
LWW - Head	3/16/9	13:34	
LWW - Head	3/19/9	8:50	
IG - Intake	3/18/9	9:30	
" "	3/18/9	8:30 Duplicate	
LWW Head	3/16/9	13:50	
LWW Head	3/20/9	12:05	
IG-Intake	3-16-09	1355) HH (not listed but had bottle) HH	

I will use a bottle per for both TSS

Thx.

Bob Bower

Called & left message for Bob about extra bottle. 3-23-09 @ 0936 HH

09-03975

3-23-09
UPS 3

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INVOICE

Client No: WAL06

Please include this number with payment

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 SOUTH MAIN STREET
MILTON-FREEWATER, OR 97862

Attn: Bob Bower

Reference: **09-04307**
Date: April 3, 2009
Project: Recharge Project Monitoring
Date Received: March 30, 2009
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	8827.00	IG-INTAKE	3/26/09	Total Suspended Solids	$19.00
2	8828.00	IG-INTAKE DUP	3/26/09	Total Suspended Solids	$19.00
3	8829.00	IG-INTAKE	3/27/09 @ 1435	Total Suspended Solids	$19.00
4	8830.00	IG-INTAKE	3/27/09 @ 1438	Total Suspended Solids	$19.00
5	8831.00	IG-INTAKE	3/24/09	Total Suspended Solids	$19.00
6	8832.00	LWW-HEAD	3/24/09	Total Suspended Solids	$19.00
7	8833.00	LWW-HEAD	3/26/09	Total Suspended Solids	$19.00
8	8834.00	LWW-HEAD DUP	3/26/09	Total Suspended Solids	$19.00
9	8835.00	LWW-HEAD	3/27/09 @ 1400	Total Suspended Solids	$19.00
10	8836.00	LWW-HEAD	3/27/09 @ 1433	Total Suspended Solids	$19.00

Grand Total:	$190.00
Amount Paid:	$0.00
Amount Due:	$190.00

Thank You for Your Business

Please pay by May 3, 2009 to avoid a 1.5% per month finance charge.

EDGE ANALYTICAL LABORATORIES

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

April 2, 2009

Mr. Bob Bower
Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

RE: 09-04307 - Recharge Project Monitoring

Dear Mr. Bob Bower,

Your project: Recharge Project Monitoring, was received on Monday March 30, 2009.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

EDGE ANALYTICAL LABORATORIES

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Data Report

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Reference Number: **09-04307**
Project: Recharge Project Monitoring
Report Date: 4/2/09
Date Received: 3/30/09
Peer Review: JM

Sample Description: IG-INTAKE - 3/26/09 | Sample Date: 3/26/09
Lab Number: 8827 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: IG-INTAKE DUP - 3/26/09 | Sample Date: 3/26/09
Lab Number: 8828 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	7	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: IG-INTAKE - 3/27/09 @ 1435 | Sample Date: 3/27/09
Lab Number: 8829 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	6	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: IG-INTAKE - 3/27/09 @ 1438 | Sample Date: 3/27/09
Lab Number: 8830 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	6	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: IG-INTAKE - 3/24/09 | Sample Date: 3/24/09
Lab Number: 8831 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	4	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: LWW-HEAD - 3/24/09 | Sample Date: 3/24/09
Lab Number: 8832 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	24	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Notes:
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

Reference Number: **09-04307**

Report Date: 4/2/09

Data Report

Sample Description: LWW-HEAD - 3/26/09 | Sample Date: 3/26/09
Lab Number: 8833 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	10	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: LWW-HEAD DUP - 3/26/09 | Sample Date: 3/26/09
Lab Number: 8834 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	5	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: LWW-HEAD - 3/27/09 @ 1400 | Sample Date: 3/27/09
Lab Number: 8835 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Sample Description: LWW-HEAD - 3/27/09 @ 1433 | Sample Date: 3/27/09
Lab Number: 8836 | Collected By: Unknown

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.68	mg/L	1	SM2540 D	3/31/09	MAK	TSS_090331	

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

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Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-04307
Report Date: 04/02/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090331	TOTAL SUSPENDED SOLIDS	470	500	mg/L	SM2540 D	94	80-120		LFB	
TSS_090331	TOTAL SUSPENDED SOLIDS	490	500	mg/L	SM2540 D	98	80-120		LFB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

\ = Indicates % Recovery could not be calculated.

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MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

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SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 09-04307
Report Date: 04/02/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090331	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090331	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	

*Notation:

% Recovery = (Result of Analysis)/(True Value) * 100

A = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

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QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 09-04307

Report Date: 4/2/2009

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
TSS_090331									

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

To whom it may concern

Samples are for IG - Intake & LWW - Head, recharge propst monitoring. No chain of custody required.

509-520-3534

09-04307
8827 - 8836

09-04307

3.30.09 9:45

UPS

NO COC Given

09-04307

Walla Walla

TSS

LWW - Head

3/24/09 2:35

3/26/09 11:00

Dup 3/26/09 11:00

3/27/09 14:00

3/27/09 14:33

IG Intake

3/26/09 10:41

Dup 3/26/09 10:41

3/27/09 14:35

3/27/09 14:38

3/24/09 14:45

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Bellingham WA (Microbiology) | 805 Orchard Dr Suite 4 - 98225
360.671.0688 • 360.671.1577fax

INVOICE

Client No: WAL06

Client: WALLA WALLA BASIN WATERSHED COUNCIL
810 SOUTH MAIN STREET
MILTON-FREEWATER, OR 97862

Attn: Bob Bower

Please include this number with payment

Reference: **09-01621**
Date: February 6, 2009
Project: TSS
Date Received: February 04, 2009
Purchase Order:

Item	Lab Sample Number	Client Sample Number	Client Sample Description	Type of Analysis	Extended Cost
1	3362.00	IG P2-2	IG P2-2	Total Suspended Solids	$19.00
2	3363.00	IG P2-5	IG P2-5	Total Suspended Solids	$19.00
3	3364.00	IG P2-5	IG P2-5	Total Suspended Solids	$19.00
4	3365.00	IG-INTAKE	IG-INTAKE	Total Suspended Solids	$19.00
5	3366.00	IG-P2-H	IG-P2-H	Total Suspended Solids	$19.00
6	3367.00	IG-P2-8	IG-P2-8	Total Suspended Solids	$19.00
7	3368.00	IG-P2-6	IG-P2-6	Total Suspended Solids	$19.00
8	3369.00	IG-P2-4	IG-P2-4	Total Suspended Solids	$19.00
9	3370.00	IG-INTAKE	IG-INTAKE	Total Suspended Solids	$19.00
10	3371.00	LWW-HEAD GATE	LWW-HEAD GATE	Total Suspended Solids	$19.00
11	3372.00	IG-P2-6	IG-P2-6	Total Suspended Solids	$19.00
12	3373.00	IG-INTAKE	IG-INTAKE	Total Suspended Solids	$19.00
13	3374.00	IG-P2-4	IG-P2-4	Total Suspended Solids	$19.00
14	3375.00	IG-INTAKE	IG-INTAKE	Total Suspended Solids	$19.00
15	3376.00	IG-P2-5	IG-P2-5	Total Suspended Solids	$19.00
16	3377.00	IG-INTAKE C	IG-INTAKE C	Total Suspended Solids	$19.00
17	3378.00	IG-P2-6	IG-P2-6	Total Suspended Solids	$19.00
18	3379.00	IG-INTAKE	IG-INTAKE	Total Suspended Solids	$19.00
19	3380.00	IG-P2-3	IG-P2-3	Total Suspended Solids	$19.00
20	3381.00	IG-P2-4	IG-P2-4	Total Suspended Solids	$19.00
21	3382.00	IG-P2-5	IG-P2-5	Total Suspended Solids	$19.00
22	3383.00	IG-P2-5	IG-P2-5	Total Suspended Solids	$19.00
23	3384.00	IG-P2-4	IG-P2-4	Total Suspended Solids	$19.00
24	3385.00	IG-P2-4	IG-P2-4	Total Suspended Solids	$19.00

Grand Total:	$456.00
Amount Paid:	$0.00
Amount Due:	$456.00

Thank You for Your Business

Please pay by March 8, 2009 to avoid a 1.5% per month finance charge.

EDGE ANALYTICAL LABORATORIES

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Microbiology | 360.671.0688 • 360.671.1577fax

February 6, 2009

Bob Bower
Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

RE: 09-01621 - TSS

Dear Bob Bower,

Your project: TSS, was received on Wednesday February 04, 2009.
All samples were analyzed within the accepted holding times, were appropriately preserved and were analyzed according to approved analytical protocols. The quality control data was within laboratory acceptance limits, unless specified in the QA reports.

If you have questions phone me at 800 755-9295.

Respectfully Submitted,

Lawrence J Henderson, PhD
Director of Laboratories

Enclosures Data Report
QC Reports
Chain of Custody

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360.671.0688 • 360.671.1577fax

Data Report

Client Name: Walla Walla Basin Watershed Council
810 South Main Street
Milton-Freewater, OR 97862

Reference Number: **09-01621**
Project: TSS
Report Date: 2/6/09
Date Received: 2/4/09
Peer Review:

Sample Description: IG P2-2
Lab Number: 3362
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	191	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG P2-5
Lab Number: 3363
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	496	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG P2-5
Lab Number: 3364
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	1670	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-INTAKE
Lab Number: 3365
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	9	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-H
Lab Number: 3366
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	747	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-8
Lab Number: 3367
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	2202	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Notes:
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

If you have any questions concerning this report contact us at the above phone number.

Form: cRslt_2.rpt

Reference Number: **09-01621**
Report Date: 2/6/09

Data Report

Sample Description: IG-P2-6
Lab Number: 3368
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	954	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-4
Lab Number: 3369
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	539	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-INTAKE
Lab Number: 3370
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	4	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: LWW-HEAD GATE
Lab Number: 3371
Sample Date: 2/2/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	ND	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-6
Lab Number: 3372
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	732	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-INTAKE
Lab Number: 3373
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	7	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-4
Lab Number: 3374
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	564	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Notes:
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

Reference Number: **09-01621**
Report Date: 2/6/09

Data Report

Sample Description: IG-INTAKE
Lab Number: 3375
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	8	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-5
Lab Number: 3376
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	1282	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-INTAKE C
Lab Number: 3377
Sample Date: 2/2/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	5	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-6
Lab Number: 3378
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	773	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-INTAKE
Lab Number: 3379
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	5	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-3
Lab Number: 3380
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	4280	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-4
Lab Number: 3381
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	880	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Notes:

ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

Reference Number: **09-01621**
Report Date: 2/6/09

Data Report

Sample Description: IG-P2-5
Lab Number: 3382
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	8420	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-5
Lab Number: 3383
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	1346	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-4
Lab Number: 3384
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	7110	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Sample Description: IG-P2-4
Lab Number: 3385
Sample Date: 1/29/09
Collected By:

CAS ID#	Parameter	Result	PQL	MDL	Units	DF	Method	Analyzed	Analyst	Batch	Comment
E-10162	**TOTAL SUSPENDED SOLIDS**	610	4	1.68	mg/L	1	SM2540 D	2/5/09	MAK	TSS_090205	

Notes:
ND = Not detected above the listed practical quantitation limit (PQL) or not above the Method Detection Limit (MDL), if requested.
PQL = Practical Quantitation Limit is the lowest level that can be acheived within specified limits of precision and accuracy during routine laboratory operating conditions.
D.F. - Dilution Factor

EDGE ANALYTICAL LABORATORIES

Burlington WA | 1620 S Walnut St - 98233
Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Laboratory Fortified Blank

Reference Number: 09-01621
Report Date: 02/06/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090205	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	
TSS_090205	TOTAL SUSPENDED SOLIDS	500	500	mg/L	SM2540 D	100	80-120		LFB	
TSS_090205	TOTAL SUSPENDED SOLIDS	470	500	mg/L	SM2540 D	94	80-120		LFB	
TSS_090205	TOTAL SUSPENDED SOLIDS	480	500	mg/L	SM2540 D	96	80-120		LFB	

*Notation:

%Recovery = (Result of Analysis)/(True Value) * 100

N/A = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

EDGE ANALYTICAL LABORATORIES

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Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

SAMPLE INDEPENDENT QUALITY CONTROL REPORT

Method Blank

Reference Number: 09-01621
Report Date: 02/06/09

Batch	Analyte	Result	True Value	Units	Method	% Recovery	Limits	QC Qualifier	Type*	Comment
TSS_090205	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090205	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090205	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	
TSS_090205	TOTAL SUSPENDED SOLIDS	ND		mg/L	SM2540 D		1.00000		MB	

*Notation:

%Recovery = (Result of Analysis)/(True Value) * 100

NA = Indicates % Recovery could not be calculated.

QCS: Quality Control Sample, a solution containing known concentrations of method analytes which is used to fortify an aliquot of reagent matrix. The QCS is obtained from an external source and is used to check lab performance.

LFB: Laboratory Fortified Blank, an aliquot of reagent matrix to which known quantities of method analytes are added in the lab. The LFB is analyzed exactly like a sample, and its purpose is to determine whether method performance is within accepted control limits.

MB or LRB: Method Blank or Laboratory Reagent Blank, an aliquot of reagent matrix is analyzed exactly like a sample, and its purpose is to determine if there is background contamination.

FORM: QC Independent

EDGE ANALYTICAL LABORATORIES

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Corporate Office | 800.755.9295 • 360.757.1400 • 360.757.1402fax
Bellingham WA | 805 Orchard Dr Suite 4 - 98225
Microbiology | 360.671.0688 • 360.671.1577fax

QUALITY CONTROL REPORT

Duplicate and Matrix Spike/Matrix Spike Duplicate Report

Reference Number: 09-01621

Report Date: 2/6/2009

Duplicate

Batch	Sample	Analyte	Result	Duplicate Result	Units	%RPD	Limits	QC Qualifier	Comments
TSS_090205									
	3370	TOTAL SUSPENDED SOLIDS	4	4	mg/L	**0.0**	0-45		DUP
	3380	TOTAL SUSPENDED SOLIDS	4280	3916	mg/L	**8.9**	0-45		DUP
	3385	TOTAL SUSPENDED SOLIDS	610	633	mg/L	**3.7**	0-45		DUP

%RPD = Relative Percent Difference

NA = Indicates %RPD could not be calculated

Matrix Spike (MS)/Matrix Spike Duplicate (MSD) analyses are used to determine the accuracy (MS) and precision (MSD) of a analytical method in a given sample matrix. Therefore, the usefulness of this report is limited to samples of similar matrices analyzed in the same analytical batch.

Only Duplicate sample with detections are listed in this report

2,680

Chain of Custody / Analysis Request (Please complete all applicable shaded sections)

Report to:	Walla Walla Basin Watershed Cour	Bill to:	Walla Walla Basin Watershed Counc	**For Lab Use Only**	
Ship Address:	810 S Main Street	Address:	810 S Main Street	Ref #	
City:	Milton-Freewa St: OR Zip: 97862	City:	Milton-Freewa St: OR Zip: 97862	**Check Regulatory Program**	
Attn:	Bob Bower	Phone:	FAX:	☐ Safe Drinking Water Act	
Phone:	541.938-2170 FAX:	P.O.#:	Attn:	☐ Clean Water Act	
Email:	bob.bower@wwwbwc.org	☐ Visa ☐ M/C ☐ A/E	Expires /	☐ RCRA / CERCLA	
Project		Card#:		☐ Other	

EDGE ANALYTICAL
"The lab you can trust"
1620 S. Walnut St.
Burlington, WA 98233
1.800.755.9295

805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

Instructions
1. Use one line per sample.
2. Be specific in analysis requests.
3. Check off analyses to be performed for each sample.
4. Enter number of containers.

Turn Around Time Required
- ☒ Standard
- ☐ Half-time (50% surcharge)
- ☐ Quickest (100% surcharge)
- ☐ Other

Analyses Requested

CO002680

Field ID	Location	Grab/ Comp.	Matrix	Date	Time	SOC Package	TKN, COD	NO3, o-PO4, Cl, TDS	1 Set HCL Green caps only.	TSS				Number of Containers	Special Instructions Conditions on Receipt
X IG-#s	Infiltration Galley	24				☐	☐	☐	☐	✓	☐	☐	☐	1	24 sample, for Inf. Hration galley testing.
1 Ig p2-2				1.29	11:15	☐	☐	☐	☐	☐	☐	☐	☐		
2 Ig p2-5				1.29	10:52	☐	☐	☐	☐	☐	☐	☐	☐		
3 Ig p2-5				1.29	13:58	☐	☐	☐	☐	☐	☐	☐	☐		
4 Ig-Intake				1.29	13:57 (13:57)	☐	☐	☐	☐	☐	☐	☐	☐		
5 Ig-p2-4				1.29	13:57	☐	☐	☐							
6 Ig-p2-8				1.29	11:45	☐	☐	☐							
7 Ig-p2-6				129	11:59	☐	☐	☐							
8 Ig-p2-4				1.29	12:57	☐	☐	☐	☐	☐	☐	☐	☐		
10						☐	☐	☐	☐	☐	☐	☐	☐		

09-01621
3362 - 3385

Sampled by: Bower Phone: 541-938-2170 FAX: Email: bob.bower@wwbwc.org Total Containers

Sample Receipt Request (Must include FAX or Email) ☐

2.4.09 No info on COC - okay, to take in & off bottles & time/date - Cindy O'Toole will talk to client regarding info that needs to be filled out on CoC. OK - fran

Relinquished by	Date	Time	Received by	Date	Time
				2.4.09	10:15

	Yes	No	N/A
Custody seals intact	☐	☐	☐
Sample temp 3 C satisfactory	☐	☐	☐
Samples received intact	☐	☐	
Chain of custody & labels agree	☐	☐	

UPS

CHAIN OF CUSTODY / ANALYSIS REQUEST (PLEASE COMPLETE ALL APPLICABLE SHADED SECTIONS)

REPORT TO:	BILL TO:	FOR LAB USE ONLY
ADDRESS:	ADDRESS:	REF#
CITY: STATE: ZIP:	CITY: STATE: ZIP:	CHECK REGULATORY PROGRAM
ATTN:	PHONE: FAX:	☐ SAFE DRINKING WATER ACT
PHONE: FAX:	P.O.#: ATTN:	☐ CLEAN WATER ACT
EMAIL:	☐ VISA ☐ M/C ☐ A/E EXPIRES /	☐ RCRA / CERCLA
PROJECT NAME:	CARD#	☐ OTHER

EDGE ANALYTICAL LABORATORIES

Corporate
1620 S Walnut St
Burlington, WA 98233
1.800.755.9295

Microbiology
805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

INSTRUCTIONS
1. USE ONE LINE PER SAMPLE **LOCATION**.
2. BE SPECIFIC IN TEST REQUESTS.
3. CHECK OFF ANALYSIS TO BE PERFORMED FOR EACH SAMPLE LOCATION.
4. ENTER NUMBER OF CONTAINERS.

TURN AROUND TIME REQUIRED
- ☐ STANDARD
- ☐ HALF-TIME (50% SURCHARGE)
- ☐ QUICKEST (100% SURCHARGE) PHONE CALL REQ.
- ☐ EMERGENCY (PHONE CALL REQUIRED)

ANALYSIS REQUESTED

	SAMPLE ID	LOCATION	GRAB/ COMP.	MATRIX	DATE	TIME								NUMBER OF CONTAINERS	SPECIAL INSTRUCTIONS/ CONDITIONS ON RECEIPT
11	Ig-Intake				1.29	14:55	☐	☐	☐	☐	☐	☐	☐		
12	Lww-Head gate				2.2	9:43	☐	☐	☐	☐	☐	☐	☐		
13	Ig-p2-6				1.29	13:59	☐	☐	☐	☐	☐	☐	☐		
14	Ig-Intake				1.29	10:00	☐	☐	☐	☐	☐	☐	☐		
15	Ig-p2-4				1.29	14:59	☐	☐	☐	☐	☐	☐	☐		
16	Ig-Intake				1.29	10:32	☐	☐	☐	☐	☐	☐	☐		
17	Ig-p2-5				1.29	14:59	☐	☐	☐	☐	☐	☐	☐		
18	Ig Intake C				2.2.09	9:30	☐	☐	☐	☐	☐	☐	☐		
19	Ig-p2-6				1.29	15:00	☐	☐	☐	☐	☐	☐	☐		
20	Ig-Intake				1.29	11:14	☐	☐	☐	☐	☐	☐	☐		

SAMPLED BY: PHONE: FAX: EMAIL: ◀TOTAL CONTAINERS

SAMPLE RECEIPT REQUESTED (MUST INCLUDE FAX OR EMAIL) ☐

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME

	YES	NO	N/A
CUSTODY SEALS INTACT	☐	☐	☐
SAMPLE TEMP_____°C SATISFACTORY	☐	☐	☐
SAMPLES RECEIVED INTACT	☐	☐	
CHAIN OF CUSTODY & LABELS AGREE	☐	☐	

FORM: COC 10-02-2007

CHAIN OF CUSTODY / ANALYSIS REQUEST (PLEASE COMPLETE ALL APPLICABLE SHADED SECTIONS)

REPORT TO:	BILL TO:	FOR LAB USE ONLY
ADDRESS:	ADDRESS:	REF#
CITY: STATE: ZIP:	CITY: STATE: ZIP:	CHECK REGULATORY PROGRAM
ATTN:	PHONE: FAX:	☐ SAFE DRINKING WATER ACT
PHONE: FAX:	P.O.#: ATTN:	☐ CLEAN WATER ACT
EMAIL:	☐ VISA ☐ M/C ☐ A/E EXPIRES /	☐ RCRA / CERCLA
PROJECT NAME:	CARD#	☐ OTHER

EDGE ANALYTICAL LABORATORIES

Corporate
1620 S Walnut St
Burlington, WA 98233
1.800.755.9295

Microbiology
805 W. Orchard Dr. Suite 4
Bellingham, WA 98225

INSTRUCTIONS
1. USE ONE LINE PER SAMPLE LOCATION.
2. BE SPECIFIC IN TEST REQUESTS.
3. CHECK OFF ANALYSIS TO BE PERFORMED FOR EACH SAMPLE LOCATION.
4. ENTER NUMBER OF CONTAINERS.

TURN AROUND TIME REQUIRED
- ☐ STANDARD
- ☐ HALF-TIME (50% SURCHARGE)
- ☐ QUICKEST (100% SURCHARGE) PHONE CALL REQ.
- ☐ EMERGENCY (PHONE CALL REQUIRED)

ANALYSIS REQUESTED

	SAMPLE ID	LOCATION	GRAB/ COMP.	MATRIX	DATE	TIME								NUMBER OF CONTAINERS	SPECIAL INSTRUCTIONS/ CONDITIONS ON RECEIPT
20	Ig-p2-3				1.29	10:54	☐	☐	☐	☐	☐	☐	☐		
21	Ig-p2-4				1.29	11:15	☐	☐	☐	☐	☐	☐	☐		
22	Ig-p2-5				1.29	11:17	☐	☐	☐	☐	☐	☐	☐		
23	Ig-p2-3				1.29	12:58	☐	☐	☐	☐	☐	☐	☐		
24	Ig-p2-4				1.29	11:46	☐	☐	☐	☐	☐	☐	☐		
25	Ig-p2-4				1.29	11:45	☐	☐	☐	☐	☐	☐	☐		
7							☐	☐	☐	☐	☐	☐	☐		
8							☐	☐	☐	☐	☐	☐	☐		
9							☐	☐	☐	☐	☐	☐	☐		
10							☐	☐	☐	☐	☐	☐	☐		

SAMPLED BY: PHONE: FAX: EMAIL: ◀TOTAL CONTAINERS

SAMPLE RECEIPT REQUESTED (MUST INCLUDE FAX OR EMAIL) ☐

RELINQUISHED BY	DATE	TIME	RECEIVED BY	DATE	TIME

	YES	NO	N/A
CUSTODY SEALS INTACT	☐	☐	☐
SAMPLE TEMP_____°C SATISFACTORY	☐	☐	☐
SAMPLES RECEIVED INTACT	☐	☐	
CHAIN OF CUSTODY & LABELS AGREE	☐	☐	

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
5 / 28 / 09	5 : 30 ☒ AM ☐ PM	Walla Walla

Type of Water System (check only one box)
☐ Group A Public ☐ Private Household
☐ Group B Public ☒ Other ASR

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# ___ ___ ___ ___ ___ ___
System Name: WWBWC
Contact Person: BOB BOWER
Day Phone: (541) 938-2170 Cell Phone: (509) 520-3534
Eve. Phone: ( ) FAX: ( )
Send results to: (Print full name, address and zip code)
WALLA WALLA BASIN WATERSHED COUNCIL
810. So. MAIN P.O BOX 68
MILTON-FREEWATER, OR. 97862

SAMPLE INFORMATION

Sample collected by (name): BOB BOWER
Specific location where sample collected (address or sample site, and type of faucet): HBAIC (OBS1) * DUPLICATE
Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
___ ___ ___ ___ ___ ___ ___
Unsatisfactory routine collect date:
_____/_____/_____
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☐ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources)
☐ Total Coliform
☐ Fecal Coliform
|___|___|___|___|
Public Systems must provide Source Number from (WFI)

4. ☒ **Sample Collected for Information Only**
Construction_____ Repairs_____ Private Residence_____ Other MFC

LAB USE ONLY — DRINKING WATER RESULTS — LAB USE ONLY

☐ **Unsatisfactory**
Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Satisfactory**
Total Coliform Absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 0.0 /100ml.

MICR Method Code: ☒ 1140 ☐ 1340 ☐ 2720
Date and Time Received: 5/28/09 @ 10:00 AM
Date Analyzed: 5/28/09 (CS)
Date Reported: 5/29/09
Lab/Sample Number: 143- 06951
Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

WATER SUPPLIER COPY

CITY OF WALLA WALLA

MILL CREEK WATER TREATMENT PLANT
581 Mill Creek Road • Walla Walla, WA 99362
Phone 509/522-3775 • Fax 509/529-9681

COLIFORM BACTERIA ANALYSIS

SAMPLE COLLECTION: READ INSTRUCTIONS ON BACK OF GOLDEN ROD COPY
If instructions are not followed, sample will be rejected.

Date Sample Collected (Month Day Year)	Time Sample Collected	County
5 / 28 / 09	5 : 30 ☒ AM ☐ PM	Walla Walla

Type of Water System (check only one box)
☐ Group A Public ☐ Private Household
☐ Group B Public ☒ Other ASR

Group A and Group B Systems – Provide from Water Facilities Inventory (WFI):
ID# ___ ___ ___ ___ ___ ___
System Name: WWBWC
Contact Person: BOB BOWER
Day Phone: (541) 938-2170 Cell Phone: (509) 520-3534
Eve. Phone: ( ) FAX: ( )
Send results to: (Print full name, address and zip code)
WALLA WALLA BASIN WATERSHED COUNCIL
810 SO. MAIN P.O BOX 68
MILTON-FREEWATER, OR 97862

SAMPLE INFORMATION

Sample collected by (name): BOB BOWER
Specific location where sample collected (address or sample site, and type of faucet): HBAIC (OBS1)
Special instructions or comments:

Type of Sample (must check only **one** box of #1 through #4 listed below)

1. ☐ **Routine Distribution Sample**
Provide information below.
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

2. ☐ **Repeat Sample (follow-up to an unsatisfactory sample)**
Provide information below.
Unsatisfactory routine lab number:
___ ___ ___ ___ ___ ___ ___
Unsatisfactory routine collect date:
_____/_____/_____
Chlorinated: Yes_____ No_____
Chlorine Residual: Total_____ Free_____

3. ☐ **Raw Water Source Sample**
Required for Surface Water, GWI, and some Spring Sources)
☐ Total Coliform
☐ Fecal Coliform
|___|___|___|___|
Public Systems must provide Source Number from (WFI)

4. ☒ **Sample Collected for Information Only**
Construction_____ Repairs_____ Private Residence_____ Other MFC

LAB USE ONLY — DRINKING WATER RESULTS — LAB USE ONLY

☐ **Unsatisfactory**
Total Coliform Present **and**
☐ E.coli present ☐ E.coli absent
☐ Fecal coliform present ☐ Fecal coliform absent

☐ **Satisfactory**
Total Coliform Absent

☐ **Replacement Sample Required**

Sample not tested because:
☐ Sample too old (>30 hours)
☐ Improper container
☐ _____

Test unsuitable because:
☐ TNTC
☐ Turbid culture
☐ _____

Bacterial Density Results: Plate Count_____/ml. E.coli_____/100ml.
Total Coliform_____/100ml. Fecal Coliform 0.0 /100ml.

MICR Method Code: ☒ 1140 ☐ 1340 ☐ 2720
Date and Time Received: 5/28/09 @ 10:00 AM
Date Analyzed: 5/28/09 (CS)
Date Reported: 5/29/09
Lab/Sample Number: 143- 06950
Lab Use:

DOH Form #331-319 (revised 5/06) SEE REVERSE OF GREEN COPY FOR EXPLANATION OF RESULTS

WATER SUPPLIER COPY

Appendices II-A

OWRD Limited Testing License for HBDIC Recharge Site (#2) LL-1189

Permit to operate recharge: 2009-2014

Oregon Water Resources Department

Final Order
Limited License Application LL-1189

Appeal Rights

This is a final order in other than a contested case. This order is subject to judicial review under ORS 183.484. Any petition for judicial review must be filed within the 60-day time period specified by ORS 183.484(2). Pursuant to ORS 536.075 and OAR 137-004-0080 you may either petition for judicial review or petition the Director for reconsideration of this order. A petition for reconsideration may be granted or denied by the Director, and if no action is taken within 60 days following the date, the petition was filed, the petition shall be deemed denied.

Requested Water Use

On January 30, 2009, the Water Resources Department received completed application **LL-1189** from Hudson Bay District Improvement Company for the use of 50 cubic feet per second from the Walla Walla River, located in the SE ¼, NE ¼, Section 2, and the SW ¼, NE ¼, Section 12, Township 6 North, Range 35 East, W.M., for ground water recharge use, for the period of February 19, 2009, through February 18, 2014.

Authorities

The Department may approve a limited license pursuant to its authority under ORS 537.143, 537.144 and OAR 690-340-0030.

ORS 537.143(2) authorizes the Director to revoke the right to use water under a limited license if it causes injury to any water right or a minimum perennial streamflow.

A limited license will not be issued for more than five consecutive years for the same use, as directed by ORS 537.143(8).

Findings of Fact

1. The forms, fees, and map have been submitted, as required by OAR 690-340-0030(1).

2. The Department provided public notice of the application, on February 3, 2009, as required by OAR 690-340-0030(2).

3. This limited license request is limited to an area within a single drainage basin as required by OAR 690-340-0030(3).

4. The Department has determined that there is water available for the requested use.

5. The Department has determined that the proposed source has not been withdrawn from further appropriation.

6. Because this use is from surface water and has the potential to impact fish, the Department finds that fish screening is required to protect the public interest.

7. Because the use requested is longer than 120 days and because the use is in an area that has sensitive, threatened or endangered fish species, the use is subject to the Department's rules under OAR 690-33. These rules aid the Department in determining whether a proposed use will impair or be detrimental to the public interest with regard to sensitive, threatened, or endangered fish species.

8. The Department has received comments related to the possible issuance of the limited license from the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) in support of the project and requesting measured and reported data and results from the previous 5 years and annual reporting of results to CTUIR and basin water managers. Oregon Department of Environmental Quality (ODEQ) notified the Department that it had no comments, since the water quality monitoring plan for the previous Limited License was acceptable, and did not change for this application. The comments did cause the Department to add additional conditions or limitations. The licensee shall work with CTUIR to provide data as requested. The authorization of limited license **LL-1189**, as conditioned below, will satisfactorily address the issues raised in those comments.

9. Pursuant to OAR 690-340-0030(4)(5), conditions have been added with regard to notice and water-use measurement.

Conclusions of Law

The proposed water use will not impair or be detrimental to the public interest pursuant to OAR 690-340-0030(2), as limited in the order below.

Order

Therefore, pursuant to ORS 537.143, ORS 537.144, and OAR 690-340-0030, application **LL-1189** is approved as conditioned below.

1. The period and rate of use for **LL-1189** shall be from February 23, 2009, through February 18, 2014, for the use of 50 cfs of water from the Walla Walla River, for the purpose of groundwater recharge testing during the period November 1 through May 15 each year.

2. The licensee shall give notice to the Watermaster in the district where use is to occur not less than 15 days or more than 60 days in advance of using the water under the limited license. The notice shall include the location of the diversion, the quantity of water to be diverted and the intended use and place of use. In the case of this application, this order serves as the notice described above.

3. When water is diverted under this Limited License, the use is limited to times when the following minimum streamflows are met in the Tum A Lum reach of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and flowing past Nursery Bridge Dam: November – 64 cfs, December and January – 95 cfs, February to May 15 – 150 cfs. Nursery Bridge Dam is located just downstream of Nursery Bridge and is downstream of the Little Walla Walla diversion. The District 5 Watermaster, based on gage and/or streamflow measurements, shall make the determination that the above described streamflows are flowing past Nursery Bridge Dam. Diversion under this Limited License shall cease when said streamflows are unmet.

4. The Licensee shall follow the same operations, monitoring and reporting plan that was developed with ODEQ for the water quality plan followed in LL-758.

5. Based on a review of water quality information generated during the term of this Limited License, or from other sources, ODEQ may require the licensee to terminate the diversion of water into the recharge area. In addition, if monitoring data or other information result in identification of potential water quality concerns, ODEQ may require modifications to the existing Limited License and/or require a permit to address the water quality concerns prior to resumption of artificial groundwater recharge.

6. Before water use may begin under this license, the licensee shall install a totalizing flow meter at each point of diversion. The totalizing flow meter must be installed and maintained in good working order. In addition the licensee shall maintain a record of all water use, including the total number of hours of pumping, the total quantity pumped, and the categories of beneficial use to which the water is applied. During the period of the limited license, the record of use shall be submitted to the Department annually, and shall be submitted to the Watermaster upon request.

7. The Director may revoke the right to use water for any reason described in ORS 537.143(2), and OAR 690-340-0030(6). Such revocation may be prompted by field regulatory activities or by any other information.

8. Use of water under a limited license shall not have priority over any water right exercised according to a permit or certificate, and shall be subordinate to all other authorized uses, including Limited Licenses issued prior to this one, that rely upon the same source.

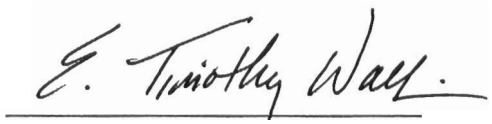
9. The licensee shall install, maintain and operate fish screening and by-pass devices as required by the Oregon Department of Fish and Wildlife to prevent fish from entering the proposed diversion. See copy of enclosed fish screening criteria for information.

10. The licensee shall provide the Confederated Tribes of the Umatilla Indian Reservation the data, results, and analysis that were sought by letter dated February 17, 2009.

11. A copy of this limited license shall be kept at the place of use, and be available for inspection by the Watermaster or other state authority.

NOTE: This water-use authorization is temporary. Applicants are advised that issuance of this final order does not guarantee that any permit for the authorized use will be issued in the future; any investments should be made with that in mind.

Issued March 5, 2009



E. Timothy Wallin, Water Rights Program Manager, *for*
Phillip C. Ward, Director
Water Resources Department

Enclosures - limited license, fish screen criteria

cc: Tony Justus, District 5 Watermaster
Bill Duke, ODFW
Phil Richerson, DEQ
Eric Quaempts, CTUIR
Hydrographics
File

If you need further assistance, please contact the Water Rights Section at the address, phone number, or fax number below. When contacting the Department, be sure to reference your limited license number for fastest service.

Remember, this limited license does not provide a secure source of water. Water use can be revoked at any time. Such revocation may be prompted by field regulatory activities or many other reasons.

Water Rights Section
Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem OR 97301-1271
Phone: (503) 986-0817 Fax: (503) 986-0901

Appendices II-B

WWBWC-HBDIC Application to OWRD Limited Testing License for HBDIC Recharge Site (#2) LL-1189

1/21/2009

Last revised: January 25, 2007

State of Oregon **Water Resources Department**
725 Summer Street NE, Suite A
Salem, Oregon 97301-1271
(503) 986-0900

Application for
Limited Water Use License

A summary of review criteria and procedures that are generally applicable to these applications is available at www.wrd.state.or.us/OWRD/PUBS/forms.shtml.

License No. LL-1689

Applicant(s): Hudson Bay District Improvement Co. (HBDIC)

Contact Person: John Zerba - HBDIC (Bob Bower - WWBWC)

Mailing Address: 144 Main str. Milton-Freewater, OR 97862

Telephone No: 541-938-6105 (Zerba) / 541-938-2176 (Bower)

I (We) make application for a Limited License to use or store the following described surface waters or groundwater-not otherwise exempt, or to use stored water of the State of Oregon for a use of a short-term or fixed duration :

1. SOURCE(S) OF WATER for the proposed use: Walla Walla River a tributary of Columbia River.

2. TOTAL AMOUNT OF WATER to be diverted: 50 cubic feet per second, or 22440 gallons per minute. If water is to be used from more than one source, give the quantity from each: -0-.

3. INTENDED USE(S) OF WATER: (check all that apply)
   - ☐ Road construction or maintenance;
   - ☐ General construction;
   - ☐ Forestland and rangeland management; or
   - ☒ Other: Aquifer Recharge

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4. DESCRIPTION OF PROPOSED PROJECT: Include a description of the intended place of use as shown on the accompanying site map, the method of water diversion, the type of equipment to be used (including pump horsepower, if applicable), length and dimensions of supply ditches and pipelines:
   ☆ See Attached cover letter & support materials.

LL-1189

5. PROJECT SCHEDULE: (List day, month, and year)
Date water use will begin Feb. 19th 2009
Date project will be completed Feb 18th 2014
Date water use will be completed Feb 18th 2014

PLEASE READ CAREFULLY

NOTE: A completed water availability statement from the local watermaster, Land Use Information Form completed by the local Planning Department, fees and site map meeting the requirements of OAR 690-340-030 must accompany this request. The fee for this request is $150 for the first point of diversion plus $15 for each additional point of diversion. *Failure to provide any of the required information will result in return of your application.* The license, if granted, will not be issued or replaced by a new license for a period of more than five consecutive years. The license, if granted, will be subordinate to all other authorized uses that rely upon the same source, or water affected by the source, and may be revoked at any time it is determined the use causes injury to any other water right or minimum perennial streamflow.

If water source is a well, well logs or adequate information for the Department to determine aquifer, well depth, well seal and open interval, etc. are required. The licensee shall indicate the intended aquifer. If for multiple wells, each map location shall be clearly tied to a well log.

If a limited license is approved, the licensee shall give notice to the Department (Watermaster) at least 15 days in advance of using the water under the Limited License and shall maintain a record of use. The record of use shall include, but need not be limited to, an estimate of the amount of water used, the period of use and the categories of beneficial use to which the water is applied. During the period of the Limited License, the record of use shall be available for review by the Department upon request.

REMARKS: OWRD Water Master (Tony Justus) sending his water availability report (separately) to Salem, for this application.

SIGNATURE of Applicant: [signature] DATE: 1-21-09
Title: HBDTC manager

Mapping Requirements (OAR 690-340-0030):
(1) A request for a limited license shall be submitted on a form provided by the Water Resources Department, and shall be accompanied by the following:
(c) A site map of reproducible quality, drawn to a standard, even scale of not less than 2 inches = 1 mile, showing:
(A) The locations of all proposed points of diversion referenced by coordinates or by bearing and distance to the nearest established or projected public land survey corner;
(B) The general course of the source for the proposed use, if applicable;
(C) Other topographical features such as roads, streams, railroads, etc., which may be helpful in locating the diversion points in the field.

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This page to be completed by the local Watermaster.

WATER AVAILABILITY STATEMENT

Name of Applicant: Hudson Bay Improvement Company Limited License Number: LL-1189

1. To your knowledge, has the stream or basin that is the source for this application ever been regulated for prior rights?

☒ Yes ☐ No

If yes, please explain:

The Walla Walla River is typically short of water to serve all water rights in July, August, September and October.

2. Based on your observations, would there be water available in the quantity and at the times needed to supply the use proposed by this application?

☒ Yes ☐ No

3. Do you observe this stream system during regular fieldwork?

☒ Yes No

If yes, what are your observations for the stream?

Typically, there can be water available November thru June. OAR Division 33 may also dictate restrictions on period of use dates.

4. If the source is a well and if WRD were to determine that there is the potential for substantial interference with nearby surface water sources, would there still be ground water and surface water available during the time requested and in the amount requested without injury to existing water rights?

☐ Yes ☐ No ☒ N/A

What would you recommend for conditions on a limited license that may be issued approving this application?

Allow diversion only when by-pass flows are met below Nursury Bridge Dam. Restrict with by-pass flows similar to the flows in Permit 53662. November- 64 cfs, December & January- 95 cfs, February thru May 15-132 cfs.

5. Any other recommendations you would like to make?

Subordinate to any other limited license from the same source issued prior to this one.

Signature _____ WM District #:_____ Date:_____

This page to be completed by the local Watermaster.

WATER AVAILABILITY STATEMENT

Name of Applicant: Hudson Bay Improvement Company Limited License Number: LL-1189

1. To your knowledge, has the stream or basin that is the source for this application ever been regulated for prior rights?

☒ Yes ☐ No

If yes, please explain:

The Walla Walla River is typically short of water to serve all water rights in July, August, September and October.

2. Based on your observations, would there be water available in the quantity and at the times needed to supply the use proposed by this application?

☒ Yes ☐ No

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3. Do you observe this stream system during regular fieldwork?

☒ Yes No

If yes, what are your observations for the stream?

Typically, there can be water available November thru June. OAR Division 33 may also dictate restrictions on period of use dates.

4. If the source is a well and if WRD were to determine that there is the potential for substantial interference with nearby surface water sources, would there still be ground water and surface water available during the time requested and in the amount requested without injury to existing water rights?

☐ Yes ☐ No ☒ N/A

What would you recommend for conditions on a limited license that may be issued approving this application?

Allow diversion only when by-pass flows are met below Nursury Bridge Dam. Restrict with by-pass flows similar to the flows in Permit 53662. November- 64 cfs, December & January- 95 cfs, February thru May 15-132 cfs.

5. Any other recommendations you would like to make?

Subordinate to any other limited license from the same source issued prior to this one.

Signature Tony Justo WM District #: 5 Date: January 30, 2009

LL-1189

Oregon Water Resources Department
Land Use Information Form

THIS FORM IS NOT REQUIRED IF: 1) water is to be diverted, conveyed, and/or used only on federal lands; or 2) the application is for a water-right transfer, allocation of conserved water, exchange, permit amendment, or ground water registration modification, and all of the following apply: a) only the place of use is proposed for change, b) there are no structural changes, c) the use of water is for irrigation, and d) the use is located in an irrigation district or exclusive farm-use zone.

Applicant Name: Hudson Bay District Improvement Company
Mailing Address: 144 Main Str.
City: Milton-Freewater State: OR Zip: 97862 Day Phone: 541-938-6105

A. Land and Location

Please include the following information for all tax lots where water will be diverted (taken from its source), conveyed (transported), or used. Applicants for municipal use, or irrigation uses within irrigation districts may substitute existing and proposed service-area boundaries for the tax-lot information requested below.

Township	Range	Section	¼ ¼	Tax Lot #	Plan Designation (e.g. Rural Residential/RR-5)	Water to be: N/A	Proposed Land Use:
6N	35E	33	NE	900	N/A	Diverted Conveyed Used	N/A
						Diverted Conveyed Used	
						Diverted Conveyed Used	
						Diverted Conveyed Used	

List all counties and cities where water is proposed to be diverted, conveyed, or used. N/A

B. Description of Proposed Use

Type of application to be filed with the Water Resources Department:

☐ Permit to Use or Store Water ☐ Water-Right Transfer ☐ Exchange of Water
☐ Allocation of Conserved Water ■ Limited Water Use License
☐ Permit Amendment or Ground Water Registration Modification

Source of water: Reservoir/Pond ☐ Ground Water ■ Surface Water (name) Walla Walla River

Estimated quantity of water needed: 50 ■ cubic feet per second ☐ gallons per minute ☐ acre-feet

Intended use of water: ☐ Irrigation ☐ Commercial ☐ Industrial ☐ Domestic for _____ household(s)
☐ Municipal ☐ Quasi-municipal ☐ Instream ■ Other Recharge

Briefly describe: HBDIC Aquifer Recharge site will recharge water to shallow aquifer for community and ecological benefits.

Note to applicant: *If the Land Use Information Form cannot be completed while you wait, please have a local government representative sign the receipt below and include it with the application filed with the Water Resources Department.*

Receipt for Request for Land Use Information

State of Oregon Water
Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301-1266

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LL-1189

For Local Government Use Only

The following section must be completed by a planning official from each county and city listed unless the project will be located entirely within the city limits. In that case, only the city planning agency must complete this form.

This deals only with the local land-use plan. Do not include approval for activities such as building or grading permits.

Please check the appropriate box below and provide the requested information

Land uses to be served by proposed water uses (including proposed construction) are allowed outright or are not regulated by your comprehensive plan. Cite applicable ordinance section(s): 152.056 .

Land uses to be served by proposed water uses (including proposed construction) involve discretionary land-use approvals as listed in the table below. (Please attach documentation of applicable land-use approvals which have already been obtained. Record of Action/land-use decision and accompanying findings are sufficient.) **If approvals have been obtained but all appeal periods have not ended, check "Being pursued".**

Type of Land-Use Approval Needed (e.g. plan amendments, rezones, conditional-use permits, etc.)	Cite Most Significant, Applicable Plan Policies & Ordinance Section References	Land-Use Approval:	
N/A	N/A	Obtained Denied	Being pursued Not being pursued
		Obtained Denied	Being pursued Not being pursued
		Obtained Denied	Being pursued Not being pursued
		Obtained Denied	Being pursued Not being pursued
		Obtained Denied	Being pursued Not being pursued

Local governments are invited to express special land-use concerns or make recommendations to the Water Resources Department regarding this proposed use of water below, or on a separate sheet.

This project previously approved by Planning. Umatilla County Planning is supportive of developing innovative, multi-beneficial water storage projects we believe we can be the "showcase" county for innovative water management solutions.

Name: J.R. Cook Title: Asst. Planning Dir.

Signature: Phone: 541.278.6251 Date: 1-26-09

Government Entity: Umatilla County

Note to local government representative: *Please complete this form or sign the receipt below and return it to the applicant. If you sign the receipt, you will have 30 days from the Water Resources Department's notice date to return the completed Land Use Information Form or WRD may presume the land use associated with the proposed use of water is compatible with local comprehensive plans.*

Receipt for Request for Land Use Information

Applicant name: _____

City or County: _____ Staff contact: _____

Signature: _____ Phone: _____ Date: _____

Last updated 12/22/06 WR

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To: Water Rights Section
Oregon Water Resources Department
158 12th St NE
Salem, OR 97310

From: Walla Walla Basin Watershed Council (WWBWC)/Hudson Bay District Improvement Company (HBDIC)
810 South Main Street
Milton-Freewater, Oregon 97862

RE: ***New*** Limited Testing License Application for HBDIC Recharge Site (Final Order 758).

To Whom It May Concern:

This letter and attached documents are being submitted in support of our application for a new limited testing license for aquifer recharge at the HBDIC Recharge project, in Umatilla County Oregon. The actual recharge site is located in the NE ¼, of Section 33, Township 6 North, and Range 35 East. The project has been in operation for nearly 5 years and has shown to effectively recharge water to the aquifer, help restore baseflows to downgradient streams and recharge good quality surface water in to the shallow aquifer system. Through a series of Rules Advisory Committee (RAC) meetings last spring and early summer the OWRD worked to add aquifer recharge to the basin rules[1] along with surface storage. The RAC was decided that the decision to add aquifer recharge and surface storage for the Walla Walla basin would be delayed pending the US Army Corp of Engineers (CTUIR) Feasibility study project being completed in 2010. Therefore to continue to test aquifer recharge at the HBDIC recharge site we are submitting a new limited testing license for the site (see attached).

We are also submitting the support materials (study plan, etc) from the original application titled *Hudson Bay Aquifer Recharge Project: An application for AR Testing Limited License to Oregon Water Resource Department (OWRD)* (October, 20th 2003, **Attachment A**). In this new limited testing license application we request to follow the **same** operations, monitoring and reporting plan that was outlined in this original application. ODEQ (Phil Richerson, Pendleton-ODEQ) was contacted this week regarding this new application and gave a verbal permission to submit the same water quality plan that was developed with ODEQ (2003) and submitted with our original application.

We are also requesting that the new limited license has **the same** water-use conditions of Final Order #758 including:

- Water Use time period: **November 1st through May 15th**
- Maximum Water Use Allocation of **50 cfs.**
- **Seasonal Minimum Instream flow requirements** (Walla Walla River) as were determined by ODFW and CTUIR in original application which were:
    - November 1st through November 31st = 64 cfs

[1] Mike Ladd, Tony Justus at OWRD Pendleton office can be contacted regarding this process.

- December 1st through January 31st = 95 cfs
- February 1st through May 15th = 150 cfs

Final Order #758 Final Requirements stated that "*The licensee shall meter all water use and maintain a record of use, including the total number of hours of diversion and an estimate of the total quantity diverted. During the period of the limited license, the record of use shall be available for review by the Department upon request and shall be submitted to the Watermaster upon request. Upon project completion, the license shall submit the record of use to the Water Resources Department.*"

At the time of this letter, the project was still in operations (2008-9 recharge season), but a summary for the *record of use* (as outlined above) can be found in **Attachment B**. The attachment outlines both the water use from the Walla Walla River (POD) to the HBDIC Recharge Project (as estimated conveyance loss of 10 cfs) and the actual water use at the HBDIC recharge site. Following the completion of final order #758, a summary of all water use 2004-2009 will be provided to the department. All water use meter records are available to OWRD staff at any time, upon request. As the HBDIC site has gone through several expansions during this 2004-2008 period, **Attachment C** outlines some additional information that will help assess the changes in water use at the site over the period of record. The HBDIC recharge project managers intend to further develop this site for recharge testing upon approval of a new limited testing license.

You will find the following Attachments in support of this new application:

- ❑ **Attachment A-C:** Original Application Supporting document that includes:
  - Maps of site as required by OWRD application
  - ODEQ Water Quality Monitoring Plan (and supplementary changes)
- ❑ **Attachment D**: Copy of Current OWRD Limited Testing License (Final Order#758)
- ❑ **Attachment E:** Original Water availability report from OWRD water master (New one being sent to Salem from Pendleton Office)

Also attached you will find the application fee for $165 dollars to cover new limited license application. As there are now two separate diversions at the recharge site, we added the additional $15 for this application to ensure the proper fee was submitted.

Thank you for your continued support.

Robert J. Bower
Senior Hydrologist/HBDIC Project Co-manager
Walla Walla Basin Watershed Council

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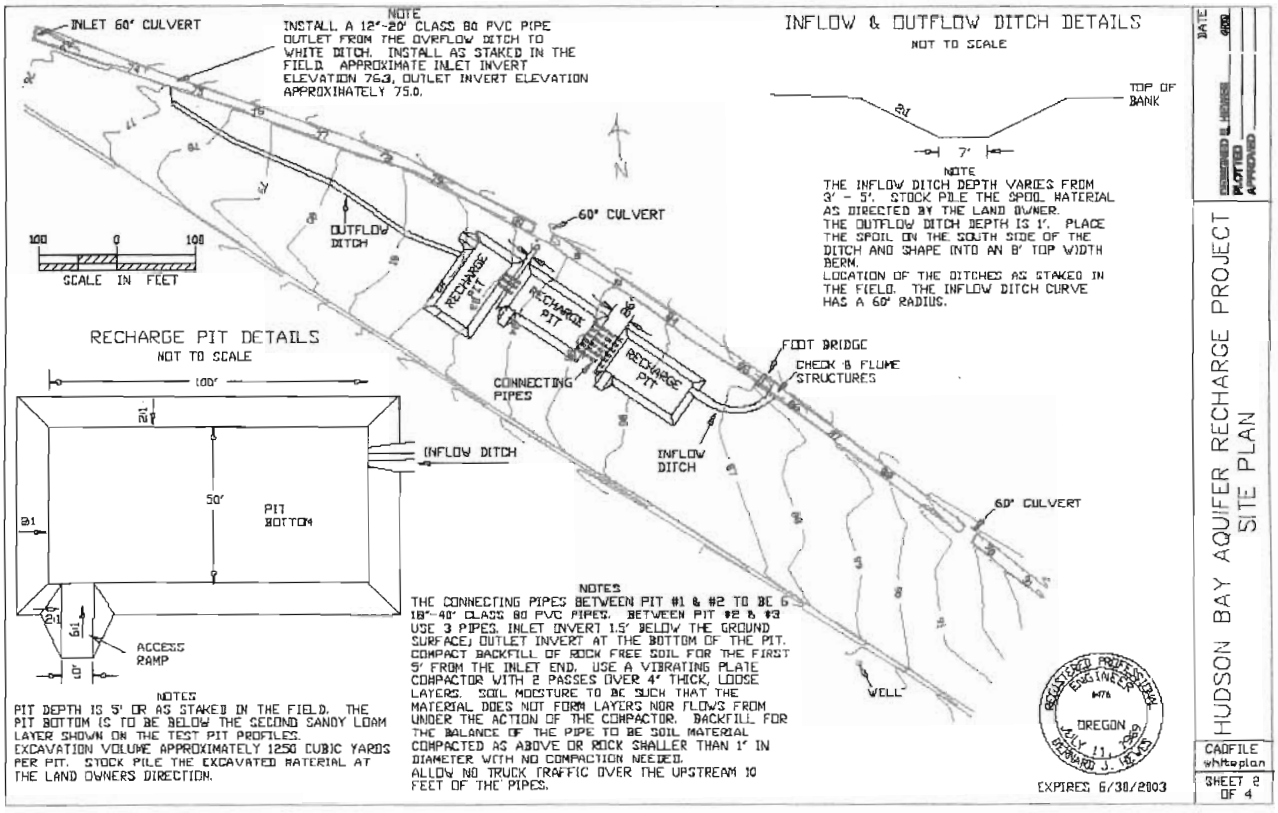
Cc: Tony Justus, OWRD Pendleton
Rick George, CTUIR, Mission
Phil Richerson, ODEQ, Pendleton
Bill Duke, ODFW, Pendleton

Attachment A

Hudson Bay Aquifer Recharge Project

An application for ASR Testing Limited License to Oregon Water Resources Department (OWRD) (OAR 690-350-0020)



Prepared for the HBDIC by:

Walla Walla Basin Watershed Council
Kennedy and Jenks Consultants, Inc.

October 20, 2003

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Table of Contents

Table of Contents 2
Introduction 4
Overview of Watershed Conditions 4
Figure 1 Scaled Map of Project and Surrounding Area 7
Figure 2 WWBW Monitoring and Recharge Site Map 8
Attachment 1. Project Layout, 690-350-0020(3)(a)(E) and (I) and 690-350-0020(3)(b)(B) 10
Engineering Attachments: 11
Attachment 1A: Location Map 11
Attachment 1B: Site Plan 11
Attachment 1C: Structure Details 11
Attachment 1D: Structure Reinforcing Steel 11
Attachment 1E: Signed and Stamped Copy of *Project Engineering Report* 11
Attachment 2. Water Rights Statement, 690-350-0020(3)(a)(F) and (G) 12
Water Right Applicant: 12
Hudson Bay District Improvement Co 12
Source of Water: 12
Purpose of Use: 12
Proposed Period of Use: 12
Point of Diversion Location: 12
Minimum Instream Flow Information: 12
Attachment 3. Land Use Approval, 690-350-0020(3)(a)(H) 14
Land Use Attachments 14
Attachment 3A: Umatilla County Land Use Approval 14
Attachment 3B: Lease Agreement with Landowner 14
Attachment 4. Proposed Test Program, 690-350-0020(3)(b)(A) 15
Introduction 15
Preliminary Test Site-Specific Hydrogeologic Characterization 15
Soil Characteristics 15
Geology 16
Hydrogeology 17
Surface Water 18
Water Quality 18
Characterization Conclusions 19
Preliminary Test Site Operation Plan 19
Site Construction 20
Test Operations 20
Test Timing, Monitoring, and Water Quantities 20
Outside Influences 21
Responsible Parties and Access Permission 22
Mitigation 22
Reporting 22
Attachment 5. Proposed Monitoring Program, 690-350-0020(3)(b)(A) 23
Overview of Basin Wide Monitoring Plan 23
Recharge Project Monitoring Plan 23
Sampling and Analysis Program 24
(1) Source Water at Test Site 24
(2) Site Groundwater 25
(3) Distal Groundwater 25
(4) Surface Water (Springs) 26
Sampling Parameters 26

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JAN 30 2009
WATER RESOURCES DEPT

Sampling Procedure 27
Equipment 27
Water Level 27
Decontamination 28
Purging and Field Parameters (On site wells only) 28
Water Sampling 28
Resampling 29
Chain of Custody and Sample Handling 29
Field Records and Data Validation 29
Data Reporting and Statistical Analysis 30
Record Keeping 30
Evaluation 30
Data evaluation will include: 30
Annual Review and Reporting 30
Final Recharge Test Project Report 31
Monitoring Plan Attachments 31
Attachment 5A. Methodology Water Quality Assessment and Evaluation 31
Attachment 5B. Figure 5A Map of On-site Recharge Well Locations 31
Attachment 5C Chemicals of interest for Hudson Bay Recharge Project 31
Attachment 6. Site Hydrogeology, 690-350-0020(3)(b)(C), (E), and (G) (attached) 32
Attachment 7. Source Water Quality, 690-350-0020(3)(b)(D) 32
Overview 32
Attachment 7A Source Water Quality Information 32
Resources and References: 33
ATTACHMENTS 34

Attachment 5D History of chemical use - Recharge Site Specific
Attachment 8A Water Availability (Water Master)
8B Application form - OWRD

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Introduction

The Walla Walla Basin Watershed Council (WWBWC), in cooperation with the Hudson Bay District Improvement Company (HBDIC), has proposed to test shallow aquifer recharge at a site located adjacent to the HBDIC's *White Ditch* in section 33, T6N, R35E. At the test site a series of three infiltration pits will be built. Water will be supplied to these pits via a diversion from the canal. Recharge activities are proposed during the winter and spring months, when the Walla Walla River (the source of water for the canal) is running at higher flows. The proposed shallow aquifer recharge testing would be done under an ASR Testing Limited License granted by Oregon Water Resources Department (OWRD) (OAR 690-350-0020). By recharging shallow groundwater it is hoped that a portion of the recharge water will return to restore diminished spring-creek and Walla Walla River baseflows. Testing will not include removal of stored water by pumping or other artificial means.

The Limited License Application requires several supporting documents be attached (690-350-0020 (3)(b)), including (but not limited to) those describing proposed testing, groundwater conditions (including hydrogeologic conditions and groundwater quality), and source water quality. Information not included in this assessment report, but still needed for the application, will be collected during proposed site-specific hydrogeologic characterization, monitoring, and testing process. This limited license application is to gain approval of the proposed shallow aquifer recharge testing. The complete list of Attachments as called for in include:

Attachment 1. Project Layout and Size, 690-350-0020(3)(a)(E) and (I) and 690-350-0020(3)(b)(B)
Attachment 2. Water Rights Statement, 690-350-0020(3)(a)(F) and (G)
Attachment 3. Land Use Approval, 690-350-0020(3)(a)(H)
Attachment 4. Proposed Test Program, 690-350-0020(3)(b)(A)
Attachment 5. Proposed Monitoring Program, 690-350-0020(3)(b)(A)
Attachment 6. Site Hydrogeology, 690-350-0020(3)(b)(C), (E), and (G)
Attachment 7. Source Water Quality, 690-350-0020(3)(b)(D)

Overview of Watershed Conditions

The quantity, storage, timing, and availability of water are several major challenges facing watershed managers in the Walla Walla River Basin. The relationship between the Walla Walla River and its distributaries with that of the shallow alluvium aquifer has been shown to be highly interdependent (Piper, 1933, Newcomb, 1965, Barker & McNish, 1975, Bower et. al., 2001). The Walla Walla Basin Watershed Council, Walla Walla Watershed Alliance, and Hudson Bay District Improvement Company (HBDIC), working with their partners in OWRD, ODEQ and ODFW, propose to explore the utility of artificially recharging the shallow alluvial aquifer as a way to help offset the loss of natural recharge opportunities throughout the basin.

Surface water and shallow groundwater in the Walla Walla Basin (the Basin) form an interconnected system. In some areas, especially upstream areas where streams leave the mountains and highlands surrounding the Basin to flow out onto the Basin floor, streams historically probably branched out onto the Basin floor and some of the water they carried seeped into the ground, recharging the shallow groundwater system. This shallow groundwater, recharged near the edge of the Basin, formed the main source of clean, cool groundwater found further down basin where it returned to the surface via springs and base flow to the Walla Walla River. Through the years, the issuance of hundreds of surface and groundwater rights has resulted in the allocation of nearly all of the naturally available water in the basin. These allocations have pressured water resources, compelling the

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Washington State Department of Ecology to close ground waters to further appropriations due to concerns about dropping water table levels. Other indicators of overstressed water resources include: (1) dry or dropping well levels, some wells in OWRD's inventory of state-observation-wells, (2) dry or dropping flow volumes in the spring branches, and (3) loss of natural and artificial groundwater recharge opportunities through irrigation efficiency and improved surface water management.

The state of Oregon has recognized use of artificial recharge as a tool "that can be an effective and efficient method for storing water for futures uses."(OWRD, Umatilla Basin Report, 1988). Artificial recharge has been shown to work in other areas of Umatilla County such as the County Line Water Improvement District Project, in operation since 1977. An OWRD review of this project states "It has been instrumental in arresting and reversing ground water level declines in a portion of the Ordnance Critical Ground Water Area." (OWRD, 1988). The USGS also noted the need for artificial recharge in the Walla Walla valley to offset increased water demands and loss of natural and artificial recharge mechanisms: "(Irrigation efficiency measures) can diminish the infiltration to recharge the ground water," wrote Newcomb in his important 1965 report. "Consequently, any such plans for changes in river regimen could well be required to provide for compensatory recharge or to sustain counter charges for their diminution of natural recharge and storage.

This project will comprise of three major components: Construction-Operation, Monitoring-Evaluation and Outreach-Education.

Construction-Operation: After receiving the appropriate permits and/or approval from OWRD, OWDF, ODEQ, USFWS, NOAA Fisheries and the Umatilla County Planning Department, a series of three pits specifically designed for passive artificial recharge will be constructed on land provided by the Hudson District Improvement Company (HBDIC). The land is being leased from one of the district's patrons by the HBDIC and a written agreement for the lease has been secured. The pits will be constructed in such a way to maximize recharge rates while minimizing the ground water quality impacts during the winter/spring recharge period. Project features include a concrete check structure in adjacent White Ditch, a concrete flow-measuring flume, an open connection ditch, three excavated pits, pipes connecting the pits and an outflow ditch from the down stream pit. These pits are designed to handle 50 cubic feet per second (cfs) of water anticipated to be available during the winter/spring Walla Walla River runoff. The actual volume of winter-spring water delivered will depend on the above-mentioned permitting and review process and the actual field verified constraints once in operation. Operation of this structure will be based on the instructions provided by OWRD in the operation permit and agreed to by the various project partners and agencies.

Monitoring-Evaluation: Monitoring of project will be conducted at several levels including: (1) on-site subsurface hydrologic and hydrogeologic monitoring, (2) off-site subsurface hydrologic and hydrogeologic monitoring, (3) off-site surface monitoring of springs through flow and photo-point measurements, (4) on/off-site water quality monitoring of key physical and chemical properties. The results of this intensive monitoring will be evaluated to identify impacts of the proposed project on groundwater levels and flow beneath and around the site, on surface water and spring discharges down gradient of the site, and on base flow to the Walla Walla River. Monitoring will also identify potential problems associated with the project

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Outreach-Education: This project will also serve as an important outreach and education tool for the general public and water users of the Walla Walla valley. Particular focus and time will be spent on utilizing the site and the results for the recharge analysis to educate people on the role that ground water plays in the rivers and streams of the Walla Walla Watershed.

This project meets all of the habitat restoration actions from the *Oregon Aquatic Habitat Restoration and Enhancement Guide* including:

1. Change the trend of aquatic habitat function from one of a diminishing ability to support salmonids and other organisms to one that supports a complex, self-sustaining system. Such systems provide high quality habitat and ecological capacity for salmonids and other species; or
2. Correct or improve conditions caused by past management and/or disturbance events; or
3. Maximize beneficial habitat in the short term where watershed degradation has been extensive and natural processes will need substantial time to restore habitat; or
4. Create beneficial habitat and restore stream function to the fullest extent possible within developed areas where no reasonable expectation of returning to natural conditions exists.

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HUDSON BAY AQUIFER RECHARGE PROJECT
LOCATED IN THE NE$\frac{1}{4}$ OF SEC33, T6 N, R35E W.M.

Figure 1 Scaled Map of Project and Surrounding Area

0 400 800

SCALE IN FEET

ONE INCH EQUALS 400FT

LEGEND

POWELL PV CANAL

TAX LOT BOUNDERY LINES

QUARTER QUARTER LINES

28 27
33 34

SECTION CORNER

NOTE:
THE PURPOSE OF THIS MAP IS TO IDENTIFY THE APPROXIMATE LOCATION OF THE PROJECT. IT IS NOT INTENDED TO PROVIDE INFORMATION RELATIVE TO THE EXACT LOCATION OF PROPERTY OWNERSHIP BOUNDERY LINES OR ANY OTHER SIGNIFICANT MAP SUBJECTS

HUDSON BAY AQUIFER RECHARGE PROJECT
LOCATED IN THE NE1/4 OF SEC33, T6 N, R35E W.M.
FIGURE 1A

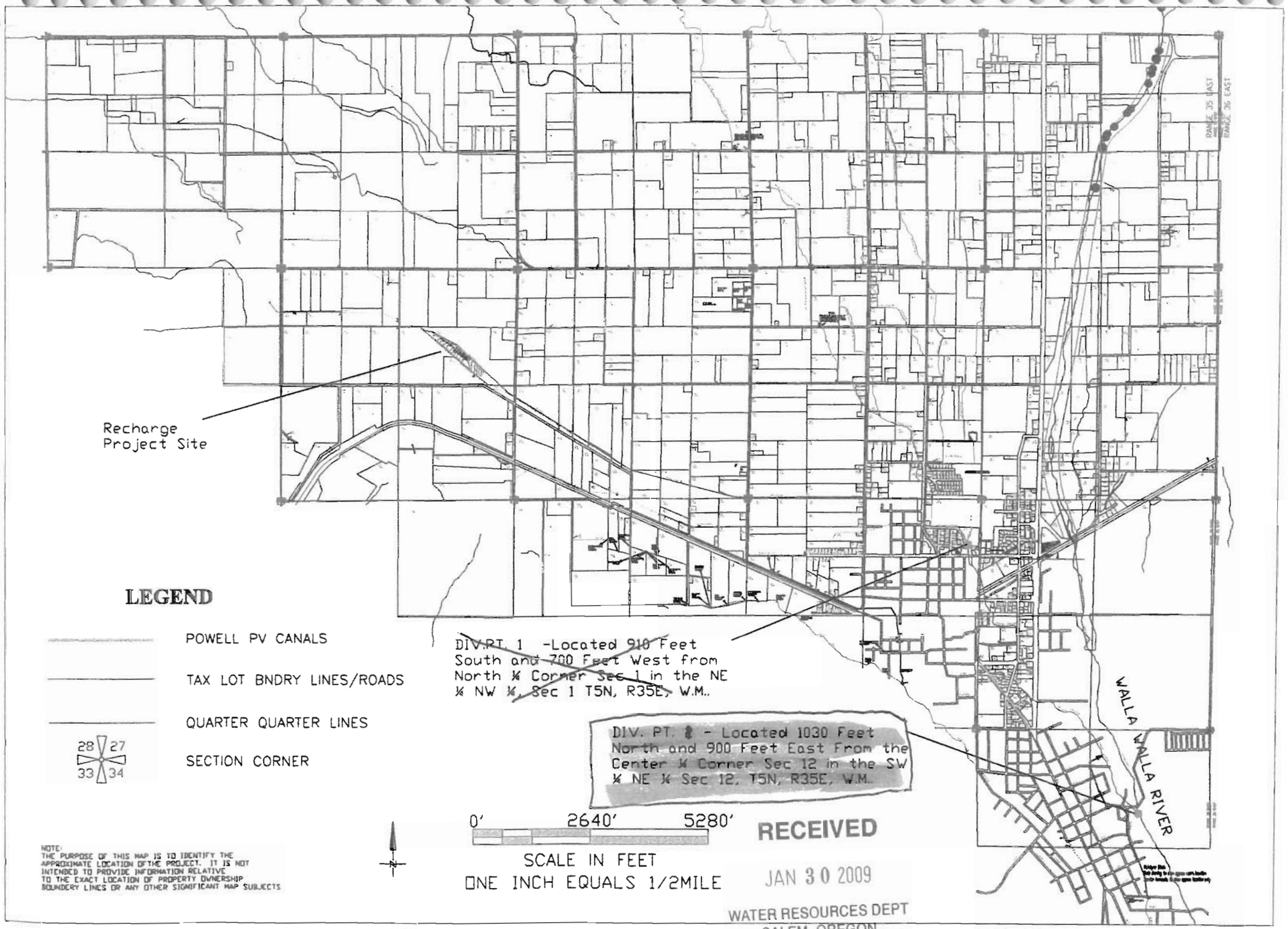

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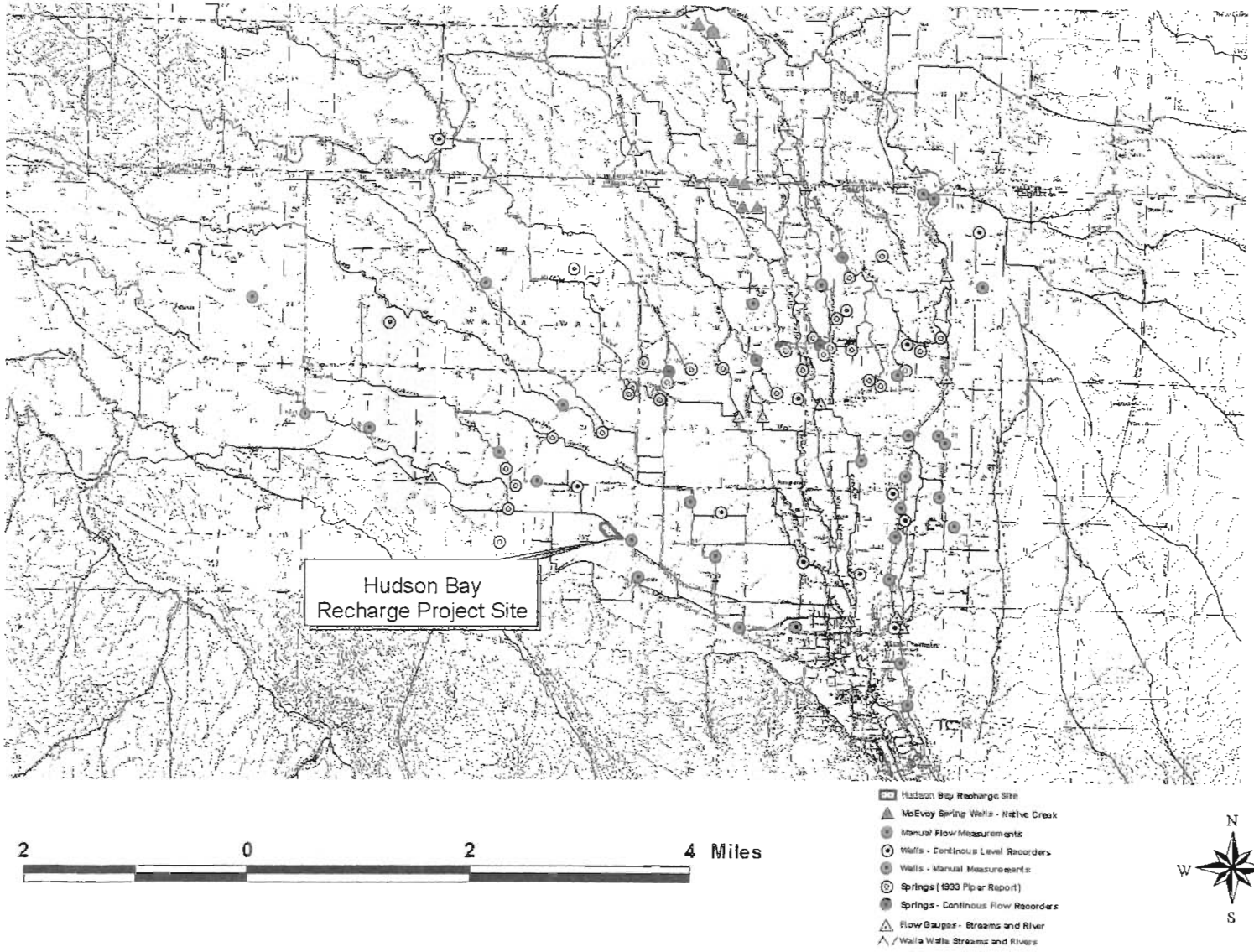
Figure 2 WWBW Monitoring and Recharge Site Map

FIGURE 2. WWBWC Monitoring Network and Hudson Bay Recharge Project 2003



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Attachment 1. Project Layout, 690-350-0020(3)(a)(E) and (I) and 690-350-0020(3)(b)(B)

Prepared by Bernard Hewes, Licensed Engineer in the State of Oregon.

This project entails diverting water from an existing irrigation ditch to three pits to be excavated for the purpose of infiltrating the water into the shallow aquifer. Project features include a concrete check structure in the existing White Ditch, a concrete flow measuring flume, an open ditch, three excavated pits, pipes connecting the pits and an outflow ditch from the down stream pit.

These items were sized to handle 50 cubic feet per second (cfs) of water. This is the amount anticipated will be available from excess flow in the Walla Walla River and that the Hudson Bay District is able to deliver.

Data gathered to design the project consisted of a site topographic survey and installing two sites for testing the water infiltration capacity of the natural materials and determining the layers in the soil profile. In addition the Soil Survey of Umatilla County Area, Oregon was consulted. This is a US Dept. of Agriculture, Natural Resources Conservation Service publication giving general soils information.

The topographic survey data was used to prepare a topographic map with one foot contour intervals at a scale of 1" = 60'. This information was used to help determine the location of the project features.

Two test pits were excavated to a depth of 6'-7' each. A 24" diameter by 5' long section of corrugated metal pipe was set on end in the bottom of the pit and about one foot of fill placed around it to hold it in place. Water was pumped into the pipe at a rate that would sustain a water depth of one foot in the pipe. Both flow rate and total flow was measured. The test was run for 6.25 hours in the first pit and 3.5 hours for the second pit.

PIT #1
Soil profile:
0-12" sandy loam
12"-36" gravelly sandy loam, approximately 50% of the material volume is gravel size particles with an estimated D 50 size of about 0.75"
36"-48" sandy loam, in parts of the trench this layer does not exist
48"-?" gravelly sandy loam approximately 20% of the volume is gravel size particles

The inflow rate at the end of the test period was 4.0 gallons per minute (gpm). This resulted in an infiltration rate of 1.7 gpm/sq. ft./ foot of head.

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PIT #2
Soil profile:
0"-13" gravelly sandy loam
13"-39" cobbly sandy loam, the D50 of the gravel is approximately 1"
39"-52" gravelly sandy loam
52"-? sand gravel mix D 50 estimated to be about 0.25"

In this pit the inflow rate of 11.9 gpm was maintained for 3.5 hours and at no time did water puddle in the bottom of the pipe. The infiltration rate is in excess of 3.8 gpm/sq. ft.

The area needed for infiltrating the water was determined assuming an infiltration rate for the entire area of 3.0 gpm/sq.ft./ per foot of head. For an inflow rate of 50 cfs the infiltration area needs to be

7480 square feet. The infiltration rate of 3.0 gpm/sq.ft. was chosen because the pits will be located in the area with soil surface texture similar to test pit #2.

Due to the possibility of fine soil particles plugging the infiltration area, unknowns concerning the long-term infiltration rate and that the amount of water available is not yet known extra infiltration area is being provided. Three separate pits with bottom dimensions of 50 feet X 100 feet are proposed. This will provide an infiltration area of 15,000 square feet.

The pits will be excavated to a depth of about 5 feet to get below the second sandy loam layer noted in both test pits. This will allow the water depth to be 2.5 feet - 3.5 feet. That will increase the rate of infiltration over the test values derived with one foot of water depth. The overall safety factor for the infiltration area is well over 2.

Inflow to the system will be measured with a ramp flume and continuously recorded. The ramp flume is sized to provide 5% flow rate accuracy over a flow range of 10 cfs-50 cfs

Any outflow from the last pit will be safely returned to the White Ditch through a 12-inch pipe. The pipe will be on a slope that will keep water from flowing out of White Ditch.

Engineering Attachments:

Attachment 1A: Location Map
Attachment 1B: Site Plan
Attachment 1C: Structure Details
Attachment 1D: Structure Reinforcing Steel
Attachment 1E: Signed and Stamped Copy of *Project Engineering Report*

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Attachment 2. Water Rights Statement, 690-350-0020(3)(a)(F) and (G)

Water Right Applicant:

Hudson Bay District Improvement Co.

P.O. Box 110
Milton-Freewater, Oregon 97862
Project Contact: John Zerba, WBDIC Board Member
Telephone: (541)-938-6100
Operations Contact: Jon Brough, WBDIC District Manager
Telephone: (541)-520-2856
Recharge Project Manager (WWBWC), Bob Bower, Hydrologist
Telephone: (541)-938-2170

Source of Water:

Walla Walla River, a tributary of the Colombia River, within the Umatilla River Basin.

Purpose of Use:

Artificial Groundwater Recharge using water diverted during the fall, winter, and spring freshet flows on the Walla Walla River and utilizing the HBDIC recharge structure near Milton-Freewater, Oregon.

Proposed Period of Use:

November 1 through May 15 and as Further limited below

Point of Diversion Location:

~~NE ¼ NW ¼, Section 1, SW ¼ NE ¼~~ Section 12, T5N, R35E, W.M.; ~~DIV. PT. 1 910 Feet South and 700 Feet West from North ¼ Corner Section 1~~; DIV. PT. 2 – 1030 Feet North and 900 Feet East From the Center ¼ Corner Section 12.

Minimum Instream Flow Information:

When water is diverted under this permit, the use is further limited to times when there is, at a minimum, the following streamflows in the Tum-a-lum branch (mainstem) of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and flowing past Nursery Bridge Dam.

Utilizing the Minimum Perennial Streamflows information (table 1, page 31) in OWRD Umatilla Basin Report (OWRD, 1988) and HBDIC's current winter water diversion permit (Permit Number 53662) the following represent the minimum instream flows at Nursery Bridge Dam:

- November – 64 cfs
- December through January – 95 cfs
- February through May 15 – 132 cfs

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Nursery Bridge is located just downstream of Nursery Bridge and is downstream of the Little Walla Walla Diversion, the East Side Canal and the District's Canal, also described as point of diversion 1 in this application.

In order for diversion to occur under this permit, the above described streamflows must be met in the Tum-a-lum branch of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and following past Nursery Bridge Dam (see OWRD permit (Permit Number 53662 for operating and maintenance requirements for this station). Said streamflows shall be measured at the gauging station described below. In the event the primary gage experiences mechanical difficulties, stream flows at Nursery Bridge Dam shall be calculated by subtracting from the streamflows at Little Walla Walla Diversion (Cemetery Bridge) from those streamflows recorded at either the WWBWC gauge at Grove School Bridge or a combination of streamflows at OWRD's North and South Fork stations (#s).

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Attachment 3. Land Use Approval, 690-350-0020(3)(a)(H)

The HBDIC recharge project staff has consulted with both the Umatilla County Planning department and the current landowner (Hulette Johnson). Attached you will find two documents addressing the anticipated land use and zoning issues needed for construction and operation of this project. The first (Attachment 3A) a Land Use Form approved by the Umatilla County Planning Department. This was originally submitted as a requirement in the funding request to the Oregon Watershed Enhancement Board. The second Attachment (Attachment 3B) was is a lease agreement between the HBDIC and the current landowner and water right holder, Hulette Johnson.

Land Use Attachments

Attachment 3A: Umatilla County Land Use Approval
Attachment 3B: Lease Agreement with Landowner

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Attachment 4. Proposed Test Program, 690-350-0020(3)(b)(A)

Introduction

The Walla Walla Basin Watershed Council (WWBWC), in cooperation with the Hudson Bay Improvement District (HBID), has proposed to test shallow aquifer recharge at a site located adjacent to the Hudson Bay Canal in section 33, T6N, R35E. At the test site a series of three infiltration pits will be built. Water will be supplied to these pits via a diversion from the canal. Recharge activities are proposed for winter and spring months when the Walla Walla River (the source of water for the canal) is at peak annual flows. The proposed shallow aquifer recharge testing will be done under an ASR Testing Limited License granted by Oregon Water Resources Department (OWRD) (OAR 690-350-0020).

Preliminary Test Site-Specific Hydrogeologic Characterization

Site-specific hydrogeologic characterization is designed to identify and define local conditions to provide a technical basis for designing the monitoring which will be used to evaluate testing. For this project a number of characterization needs are outlined in the 3 July 2003 hydrogeologic assessment letter report (Attachment 6). These needs include determining the physical properties of the geologic units underlying the test site, investigating the presence of a possible semi-confined aquifer in the upper part of the suprabasalt aquifer system, identifying aquifer hydraulic properties, and establishing suprabasalt aquifer baseline conditions, including seasonal variation, for groundwater depth, flow direction, and quality. These, and other site characterization issues, will be addressed using test site-specific hydrogeologic characterization data collected predominantly using:

1. Test pits, boreholes, and wells constructed for the direct observation of subsurface conditions
2. Infiltration tests (constant and falling head) designed to evaluate spatial variability at a site both laterally and vertically (note, the water source for this activity may require a temporary permit)
3. Aquifer testing and water level measurements to evaluate baseline aquifer physical conditions before testing
4. Surface and ground water quality data collected to evaluate the affect (if any) of test site operation on area groundwater quality
5. Well and canal records describing water use in the project area
6. Water flow metering at the test site that indicates surface water in-flow and out-flow during testing

At this time, geophysical investigations are not being considered because of the lack of subsurface control and ground truth data that could be used to constrain geophysical interpretations. The following sections describe proposed soils, geologic, hydrogeologic, surface water, and water quality characterization for this project.

Soil Characteristics

The HBDIC recharge project will be constructed by excavating the top 5 feet (72 inches) of soil from each of the recharge pits (See Engineering Design Report, ATTACHMENT 1). Test Pits constructed and evaluated in the Engineering Design Report provide site-specific soil profile information. Additionally, the "Soil Survey of Umatilla County Area, Oregon, (USDA, 1988) provides some general information about soil in the upper 60 inches at the project site. The two soils

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present at the site are: Freewater (29A) and Cowsly (22C). As the entire soil layer will be removed during construction, it was not found useful to further characterize the specific soil properties further.

Geology

Geologic features control the physical characteristics of aquifer hosting materials, and therefore the distribution and movement of groundwater through an aquifer. Understanding the nature and occurrence of these features, both regionally and locally, provide constraints on testing, data interpretation, monitoring, mitigation, and final design. The objective of geologic characterization is to develop a three dimensional physical framework that describes the materials hosting the vadose zone and groundwater at the test site. Within this framework, or conceptual model, the nature and distribution of those factors thought to control groundwater movement and distribution will be evaluated.

Site-specific geologic characterization will be accomplished largely through the analysis of data collected during the drilling of several proposed boreholes at the site and comparison of that data to information collected during the preparation of the hydrogeologic assessment report. A minimum of three boreholes are proposed for the immediate vicinity of the test site. One of these boreholes will be located on the inferred up-gradient side of the test site, two will be located on the inferred down-gradient side (Attachment 5C). As testing progresses, additional boreholes may be drilled to collect additional characterization, testing, and/or monitoring data. Subsurface hydrogeologic conditions will be interpreted via drilling cuttings and spilt-spoon sample logging.

The project hydrogeologic assessment identified work needed to complete site-specific hydrogeologic characterization. Hydrogeologic characterization targets, and the rational for them, are described below.

It is likely that the uppermost, unconfined part of the shallow aquifer system, is hosted by predominantly uncemented alluvial gravel beneath the test site. However, it is not clear from the available data how deep the alluvial gravels extend and what their properties are beneath the test site. Identifying the three-dimensional extent of these strata is critical to the proposed testing because water probably will move more rapidly through these uncemented strata, both downwards and laterally, then in the deeper, more cemented Mio-Pliocene conglomerate that comprises the majority of the shallow aquifer system in the area.

Area data indicates that, if present, the unconfined part of the shallow aquifer system at the site may be relatively thin and underlain by a semi-confined zone at depths of less than 75 feet. Characterization will identify if this semi-confined zone is actually present, and if found, the nature of the confining layer separating it from the overlying unconfined zone and the basic hydrologic properties of the semi-confined zone. Knowing the nature and extent of the confined aquifer underlying the site is critical in evaluating if the proposed recharge will affect this deeper aquifer. If data collected indicates that the project could potentially affect this deeper aquifer, monitoring will need to be designed to not only assess shallower unconfined aquifer impacts but deeper confined aquifer impacts as well.

The nature and distribution of the confining layer atop the confined aquifer should be identified in order to support evaluation of the thickness and distribution of the unconfined aquifer (if present). If the unconfined aquifer is absent, or only present seasonally, we will still need to identify the nature and extent of the confining layer because, just as it inhibits upward movement of groundwater, it will restrict the downward movement of recharge water. Knowing where the confining layer is will provide information on where recharge water may potentially collect atop this layer and where it will potentially spread to.

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Mapping for the assessment identified a potential depression in the top of the older Mio-Pliocene conglomerate below the western end, and west of, the test site. The depth, shape, and orientation of this feature will need to be evaluated because it will effect how the aquifer(s) underlying the test site responds to the testing. If an unconfined aquifer indeed underlies the site, this depression may act as a "reservoir" for water introduced into this aquifer. Alternatively, it may serve as a recharge pathway, hydrologically connecting the upper, unconfined part of the suprabasalt aquifer system with deeper, confined parts of the aquifer system.

Hydrogeology

Piezometers and/or observation wells will be constructed in the borings drilled for geologic characterization. If additional geologic characterization boreholes are drilled (either close to or more distal from the test site) one or more of these also may be converted to observation wells. All but one of the boreholes converted to monitoring wells will be completed as 2-inch observation wells that fully penetrate the unconfined aquifer (if present) or above the confining layer (if unconfined aquifer not present). At least one of the geologic characterization boreholes should be of sufficient size to accommodate a 4-inch diameter well which will be used for aquifer testing.

Test site-specific hydrogeologic work would be done, in large part, concurrently with the site-specific geology work. The hydrogeologic assessment concluded that the following information must be collected for the uppermost part of the suprabasalt system at the test site:

1. Depth, thickness, and lateral and vertical extent of the vadose zone and the uppermost aquifer(s) underlying a site.

2. Nature and effect of perching layers (if any) in the vadose zone.

3. Aquifer and vadose zone physical and hydrologic properties - including, grain size, matrix content, induration, hydraulic conductivity, transmissivity, and porosity

4. Groundwater flow direction and velocity, including both spatial and temporal variation

5. Anthropomorphic effects, primarily changes in groundwater pumping, surface water (including canals), and irrigation activities.

For characterization it is important to build monitoring (or observation) wells in such a way as to provide means for accurately measuring the target aquifer. Well construction considerations are listed below:

1. Most project observation wells will probably be 2 inch-diameter piezometer type installations. These should be built to ensure that they are monitoring the anticipated aquifer targets, and we recommend building to well construction standards and avoiding cost cutting measures designed to get more/cheaper wells (these commonly result in poorly built wells unsuitable for collection of the high quality data we feel is necessary to support the project).

2. For aquifer testing, a 4 inch-diameter observation well is the minimum recommended diameter and at least one such well should be built.

3. The minimum number of observation wells at the test site is 3, one up-gradient and 2 down-gradient. If funding can be procured we recommend that more than 3 observation wells be installed. Most, if not all, of these additional observation wells could be built in geotechnical borings drilled for geologic characterization.

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In addition to the observation wells built near the test site, it seems likely that observation wells will eventually need to be built more distant from the site. The purpose of these observation wells would be to more accurately trace the down gradient migration of recharge water away from the test site. A minimum of 3 more distant observation wells, 1 up-gradient and 2 down-gradient is again recommended. These might include at least some previously built groundwater supply wells that would be available for use. However, these should only be used if construction details can be verified and if they are not being used as water supply wells. Access to offsite observation well drilling locations will need to be acquired from willing landowners. The WWBWC currently has a network of existing wells that could be used for the purpose of tracking the recharge water distally from the site.

Aquifer testing designed to collect aquifer hydraulic property data will be part of site characterization. During aquifer testing, the 2-inch observation wells will be monitored to observe the effects of testing on the surrounding aquifer. Aquifer testing would include an 8-hour step-drawdown test to establish probable sustainable yields in the suprabasalt aquifer, followed by a 24 to 72 hour constant discharge test. Water level data collected during aquifer testing will be analyzed using standard analysis techniques.

Combining the interpretations developed in the completed hydrogeologic assessment with the drilling and testing data collected during site-specific characterization, a conceptual model of test site hydrogeologic conditions will be prepared.

Surface Water

One of the main objectives of the project is to increase surface water quantity (base flow) and improve its quality (temperature). To document that, surface water bodies that the project may influence need to be identified and monitoring points on them established and characterized (includes collection of baseline data). These locations will be used as monitoring locations during subsequent testing.

The hydrogeologic assessment identified three, down gradient, spring-feed streams, Goodman Spring Branch, Johnson Creek, and Dugger Creek, which are most likely to be affected by recharging the shallow aquifer. During test-site specific characterization these streams will be examined and monitoring points identified. At these points stream conditions will be photographed and stream conditions documented prior to the initiation of testing that will include the following parameters:

Flow volume and discharge

Water temperature

Water quality (temperature)

Hydrophilic plants and habitat quality

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Sampling frequency will be designed to collect enough data to demonstrate the range of conditions likely at the monitoring points so that site background conditions can be documented enough to provide an adequate baseline to measure test results against.

Water Quality

Both surface and groundwater quality at the test site, and at likely down-gradient discharge points, needs to be documented. There are several reasons for this, including:

1. We do not want to introduce contaminated water into the shallow aquifer via recharge activities and violate antidegradation rules. We need to establish background water quality parameter concentrations and monitor source-water quality periodically during testing and operations.

2. Certain source-water conditions (e.g., turbidity) have the potential to degrade or even "plug" the recharge system. From an operational standpoint, one would monitor for those conditions and halt test operations when the source-water exceeded those conditions.

3. Up-gradient groundwater quality needs to be monitored so that the effects of recharge on water quality can be differentiated from those water quality conditions caused by recharge activities, including leaching of vadose zone constituents by recharge water.

Sampling Quality Assurance and Quality Control (QA/QC) protocols will need to be established and followed for characterization and later monitoring. QA/QC for the project, which is described in Attachment 5, includes:

- Sampling equipment
- Measurement techniques for field parameters
- Decontamination procedures
- Well purging guidance for groundwater samples
- Sampling methods
- Chain of custody and sample handling procedures
- Record keeping
- QA/QC guidelines

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Characterization Conclusions

With the completion of site-specific characterization, updated monitoring and test plans will be prepared if necessary. These monitoring and test plans will be based on the results of the characterization effort which includes the generation of a site conceptual groundwater flow model that describes probable aquifer conditions, suprabasalt aquifer water level(s) and groundwater flow direction(s) (including seasonal variations), and discharge points for recharge water.

Preliminary Test Site Operation Plan

The objective of proposed artificial groundwater recharge testing to be done under the limited license is to evaluate the feasibility of restoring diminished shallow aquifer water levels and increasing decreased spring creek flows using infiltration pits and winter high flow water diverted from the Walla Walla River to these pits. Testing will be done over five years. If testing indicates shallow aquifer recharge and spring creek flow restoration is feasible using infiltration, test results will be used to design and implement larger scale artificial groundwater recharge at this, and potentially other sites in the area. Testing **will not include** removal of stored water by pumping or other artificial means.

This preliminary test plan describes how the test site will be operated during testing. Elements included in the preliminary test plan include: (1) site construction, (2) test operations, (3) mitigation activities, and (4) reporting. The preliminary test plan may be modified as testing proceeds.

Site Construction

The basic layout of the test site is shown on Figure 1. The site, located adjacent to the Hudson Bay Canal, will consist of three infiltration pits excavated approximately 3 feet into Quaternary alluvial gravel which immediately underlies the test site (Attachment 6). Water will be delivered to the pits via a diversion structure in the canal. Any water that does not infiltrate into the ground from these pits will be returned to the canal via a return ditch or pipe.

More detailed site construction information describing: (1) test site survey and layout (2) specifications for pits/basins/pits used for infiltration (3) water supply design (including diversion from canals if appropriate) (4) monitoring points (both on and off site) and (5) site access controls (fences, etc.) are described in detail in Attachment 1, (1A-1E), Engineering Design.

Test Operations

Test operations describe how the site will be used during testing and possible reasons for changing the test as new data and information is collected during the test. Test operations include:

1. Test timing, including timing of recharge and monitoring frequencies
2. Quantities of water used
3. Outside influences that effect test, including weather (probably freezing), elevated river turbidity, river flooding, trip wires for identifying potential offsite impacts before they occur so they can be mitigated and or testing suspended to prevent worsening conditions
4. Responsible parties for diversion and delivery of water, operation of test, monitoring, and data review
5. Permissions required to access offsite monitoring points

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These are discussed further in the following paragraphs.

Test Timing, Monitoring, and Water Quantities

Testing is tentatively planned to begin in the winter of 2003/2004 and continue for 5 years. Test operation will generally be conducted in the winter when Walla Walla River flows are at their highest and irrigation activities are at their lowest. A maximum of approximately 50 cfs will be delivered to the test site during normal operation. However, in the event minimum Walla Walla River flows are not meet, water will not be diverted from the river for test site use. Depending on stream flows in any given year, recharge water may be delivered as early as December to as late as March/April. In addition, in the event of prolonged freezing weather, test site operation may be temporally suspended to avoid ice damage to the canal diversion on the Walla Walla River, the canal system itself, and/or the recharge pits and related structures.

Water quantities delivered to the test site will be monitored via a gauge at the diversion from the canal into the test site. The return canal from the test site back into the canal will also be monitored to determine the quantity of water that leaves the test site (if any) because it did not infiltrate into the ground. Based on this monitoring data, and estimated evaporation loses that could occur during operation; water quantities discharged to the ground will be calculated.

Groundwater levels in the immediate vicinity of the test site will be monitored before, during, and following recharge test events via three (at a minimum) observation wells constructed during characterization, potentially via existing water wells in the area if any can be found that can be used for shallow aquifer water level monitoring, and potentially with new observation wells built as the test progresses. During the recharge test event, tentatively scheduled for the winter/spring of 2003/2004 water levels will be measured as follows:

1. Throughout the calendar year water levels will be measured at least weekly, beginning with the granting of the limited license.

2. In the month prior to the anticipated start of recharge activity and in the month following the termination of recharge, water levels will be measured daily.

3. During recharge water levels will be measured daily, at a minimum.

Based on preliminary engineering design studies (Attachment 1) and the hydrogeologic assessment (Attachment 6) most, if not all, of the water delivered to the test site will probably infiltrate into the ground. However, because this project is a test project, the current plan is to initially operate the test site at approximately half capacity. The quantity of water discharged to the site will than be increased or decreased as experience and observations dictate. Final operating quantities will determined based on test results.

Water quality data will also be collected before, during, and following recharge events. Parameters to be collected, sampling timing, and other water quality monitoring information are presented in the Monitoring Plan (Attachment 5).

Outside Influences

The primary currently identified outside influences on testing are Walla Walla River flow levels, freezing conditions, source water turbidity levels, and increased groundwater water levels resulting from testing that impact surface activities and conditions. The likely effects of these on testing, and possible mitigation actions to be implemented during testing, are as follows:

Low flows in the Walla Walla River will impact testing because the use of Walla Walla River water for recharge will be conditional, based on river flows exceeding a certain threshold. When flows do not, water will not be delivered to the test site and testing will not occur.

High Walla Walla River flows may also effect testing. In the event of high flow during a flood or rapid snow melt event, turbidity will generally increase. The repeated delivery of turbid water to the test site infiltration pits may eventually lead to plugging of pore space and reduced infiltration capacity. To mitigate against this, delivery of recharge water may be terminated or scaled back during high flow events. Alternatively, the pits may be periodically re-excavated to remove these fines. The preferred mitigation strategy for dealing with this will be based on monitoring and performance data collected during testing.

The effects of freezing on the test are outlined earlier in this Attachment and repeated here. In the event of prolonged freezing weather, test site operation may be temporally suspended to avoid ice damage to the canal diversion on the Walla Walla River, the canal system itself, and/or the recharge pits and related structures and to avoid the risk of ice jams forming in the canal, backing up water in the canal, and causing flooding adjacent to the canal.

It is possible that recharge testing could cause groundwater levels to reach the ground surface at locations where human activity and habitat is negatively impacted. One of the main purposes of

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groundwater level monitoring is to identify increasing water levels in the test site area in order to: (1) directly observe the effects of recharge on water levels (2) use these observations (in conjunction with characterization data) to evaluate whether or not recharge is having an impact on groundwater levels that could lead to surface problems, and (3) identify when and where this type of problem may occur. If water level monitoring data suggest increased groundwater levels are approaching the ground surface and that flooding of low lying areas seems possible, the quantity of recharge test water being delivered to the infiltration pits will be reduced or, if necessary, terminated.

Responsible Parties and Access Permission

The test will be managed primarily by the Hudson Bay District Irrigation Company, lead by John Brough, Operations Manager, and the Walla Walla Basin Watershed Council (WWBWC) technical staff, lead by Mr. Bob Bower, Hydrologist. HBDIC and WWBWC staff (or a subcontractor working for the HBDIC and WWBWC) will compile monitoring and testing data, prepare reports as necessary to meet license requirements, and in consultation with Hudson Bay Irrigation District (HBDIC) staff make decisions regarding timing and quantity of water delivered to the site and when to suspend recharge activities. Submittal of all monitoring reports to OWRD will be the responsibility of HBDIC and WWBWC staff. The HBDIC and WWBWC may choose to subcontract report preparation and delivery to a subcontractor.

HBDIC staff will be responsible for operating all facilities associated with removing recharge test water from the Walla Walla River and delivering it to the test site, including operation of the diversion structure which routes water from the canal into the pits. HBDIC staff also will maintain all equipment associated with water delivery and pit operation, including reexcavation of the pits, if necessary.

Mitigation

As stated above, one of the objectives of monitoring is to identify likely unintended consequences of recharge testing before they occur. When the precursors to these consequences, such as changing water quality detrimental to aquatic habitat or groundwater levels rising to close to the surface in areas where shallow groundwater is not desired, can be detected soon enough via monitoring, recharge activities will be modified and/or terminated to mitigate against these effects.

Reporting

Data and observations collected during testing, including monitoring data, will be compiled into reports. The basic objective of these reports will be to describe what was done during the test, what was observed at the monitoring points, interpret the data collected, and recommend changes to testing, monitoring, and mitigation plans. These reports will be produced annually. Based on the proposed recharge schedule, annual reports will be submitted to OWRD in the summer following each winter recharge test.

More frequent reporting will be done when monitoring reveals the presence of an undesired effect from testing. If monitoring reveals that undesired consequences of testing are likely to occur, WWBWC staff (or designated representative) will report the monitoring information to OWRD staff.

At the conclusion of the 5-year recharge testing done under the limited license a final report will be prepared. The final reports will describes the project, data colleted during testing and monitoring, interpretations of how well the recharge project worked in achieving project goals, and recommendations for future operations. The final report will be submitted to OWRD in the summer following the fifth annual winter recharge event.

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Attachment 5. Proposed Monitoring Program, 690-350-0020(3)(b)(A)

Overview of Basin Wide Monitoring Plan

In 2003, the WWBWC expanded its watershed monitoring strategy to include collecting basin line information for the numerous spring-creeks and district ditches spread out across the Walla Walla River valley (Oregon). Starting in June 2003, many new flow stations (15-minute stage and temperature recorders) were installed at or near the sources of nearly all the springs in the Oregon portion of the system (Figure 2). The WWBWC monitoring program has a total of 28 continuous flow stations with additional 15 continuous static well recorders with many more manual measurement locations. The objectives of this monitoring (specifically for the spring-creek and shallow aquifer system) is to accomplish the following:

1. Be able to discern between Walla Walla River Water (coming from districts water rights and use) and spring waters (emerging strictly from the shallow aquifer). It is understood that the application of irrigation water will undoubtedly show up as spring returns, but this monitoring is intended as a beginning to understanding this complicated system.
2. Collect baseline information on spring flow as it relates to seasonal and yearly fluctuations.
3. Many of the spring-creek monitoring stations were sited based on the presence of historical data collected by Piper (USGS, 1933). Where Piper had collected spring-creek flow, we attempted to locate our gauges as near as possible to his historic data sites. The intention is to allow us the ability to compare and contrast historical and current spring-creek conditions based on a significant period of time. Most of these Piper's original sites were located upstream of any irrigation with draws, making them key locations for us in this type of comparison.
4. Monitor water table levels continuously for daily, seasonal and yearly fluctuations and timing. Some of the wells being recorded have periods of record dating back to the 1930s, allowing us some opportunity to understand any long-term changes in the aquifer system.

Recharge Project Monitoring Plan

The proposed ground water recharge project exists inside this larger monitoring network and it is expected that this will help provide useful information in testing of the proposed testing (see below). Some of the sites shown in this larger network were specifically located to provide proximal and distal pre-construction and operation information for this project (Figure 2). Site specific monitoring includes observation wells and surface monitoring stations (Attachment 5B).

Monitoring for the site-specific proposed testing is designed to meet four basic objectives. These are to identify: (1) changes in the natural system caused by factors other than those related to testing, (2) changes in the natural system caused by the testing (track the test performance), (3) potential problems caused by the testing that may require modification or termination of the test and/or mitigation actions, and (4) events that effect test operations, such as a freezing or a flooding. To meet these objectives, monitoring will track:

1. Source water quality and volume coming onto the test site

2. Up-gradient groundwater water quality

3. Up-gradient groundwater level changes to provide the information needed to differentiate recharge test effects from other, natural and artificial, effects on the groundwater levels beneath test site

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4. Down-gradient groundwater quality and levels, both near and distal to the test site

5. Surface water discharge and quality changes

Four basic types of monitoring points are planned for this project:

1. Source water

2. Test site groundwater

3. Distal groundwater

4. Surface water (e.g., springs).

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Monitoring data collected at these points during testing will be evaluated against what is known about pre-test conditions to identify testing effects on the surrounding environment, differentiate those effects from others in the environment, and identify when changes in test operations appear necessary. Pre-test conditions will be determined during the planned site-specific characterization activities described in Attachment 4 and are partially described in the preliminary hydrogeologic assessment (Attachment 6).

This preliminary monitoring plan discusses monitoring activities to be undertaken at the four types of monitoring points and sampling and QA/QC protocols.

Sampling and Analysis Program

The groundwater-monitoring program proposed for the test project is outlined in the following sections. Annual reporting is proposed and a Water Quality Analysis Report will be prepared following five years of testing.

As stated in the introduction, four types of monitoring are proposed: (1) source water at the test site (2) site-specific groundwater (3) distal groundwater and (4) surface water (springs).

(1) Source Water at Test Site

Source water monitoring will be at the point of diversion onto the test site. Monitoring will include both water quantity and quality. The volume of water delivered to the test site will be monitored via a gauge at the diversion. Water quality samples will be collected at the gauge.

Proposed monitoring frequency is as follows:

Gauge data will be recorded 15-minute readings via a continuous recording data logger. Rating measurements and tables will be generated for each surface flow site and continuously checked for shifts.

Three source water quality-sampling events are proposed for each yearly seasonal recharge period. They are proposed for approximately: (1) one month prior to the projected beginning of the recharge period (2) during the mid part of the recharge period and (3) approximately one month following the end of the recharge period. The exact timing of these will be based on predicted Walla Walla River flows and may vary from year-to-year. OWRD and ODEQ staff will be notified by WWBWC staff of pending sampling events at least two weeks prior to each sampling event.

The results of source water quality monitoring will be used to determine if modifications to test operations are warranted. During testing different sampling frequencies may be tried to identify those that are most effective.

(2) Site Groundwater

Site groundwater monitoring, consisting of the collection of water quality and water level data, will be conducted at the three observations wells built during characterization. The purpose of site groundwater monitoring is to establish water quantity and quality impacts from testing to groundwater in the immediate vicinity of the site. In addition, up-gradient monitoring will be used to differentiate test impacts from those caused by other activities not controlled by the testing.

Proposed monitoring frequency is as follows:

Water levels will be measured weekly throughout the year when recharge testing is not underway.

In the month prior to, during, and the month following the yearly seasonal recharge period, water levels will be collected daily (at a minimum) for the first year of testing. Measurement frequency during subsequent years will be based on previous observations and proposed in annual reports.

Three groundwater quality sampling events are proposed for each yearly seasonal recharge period. They are proposed for approximately: (1) one month prior to the projected beginning of the recharge period (2) during the mid part of the recharge period and (3) approximately one month following the end of the recharge period. The exact timing of these will be based on predicted Walla Walla River flows and may vary from year-to-year. OWRD and ODEQ staff will be notified by WWBWC staff of pending sampling events at least two weeks prior to each sampling event.

The proposed locations of site-specific groundwater observation wells are shown on Figure 1. The results of groundwater quality and level monitoring will be used to determine if modifications to test operations are warranted. During testing different sampling frequencies may be tried to identify those that are most effective.

(3) Distal Groundwater

Distal groundwater monitoring, consisting of the collection of water quality and water level data, will be conducted at observation wells more distal from the test site than the site observation wells. Initially, during the first year of recharge testing, these wells will probably be previously constructed water supply wells that can be used by WWBWC staff and can be shown to be open to only the shallow aquifer. If funding for new wells can be procured for subsequent years, dedicated distal groundwater observations wells may be built to improve the monitoring coverage.

A minimum of 3 distal observation wells will be used, 1 up-gradient and 2 well down-gradient. The locations of these will be determined during site specific characterization currently planned for the winter of 2003. Monitoring frequency is the same as proposed for site-specific groundwater monitoring. Figure 5B shows the approximate site locations for the site-specific observation wells.

Distal monitoring will be used to identify longer term quantity impacts from testing. This includes the formation and migration of a groundwater mound and recharge water plume at, and away from, the test site, towards intended and unintended receptors. Up-gradient monitoring will be a part of this so that testing effects can be differentiated from offsite events. Sampling frequency will be determined from characterization data and modified as more is learned during testing.

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(4) Surface Water (Springs)

The WWBWC is currently monitoring most of the surface springs, creeks and rivers of Oregon's lower Walla Walla River basin (See Figure 2.) While this project will specifically Surface water monitoring in Dugger, Johnson and Goodman Spring-Creeks will be done to identify the effects of recharge on flow. This monitoring will include the collection of both water quality (specifically temperature), flow and habitat improvements (photo-documentation). As with groundwater monitoring, surface water monitoring will need up-gradient and pre-project condition monitoring information so that effects unrelated to test site operations/testing can be differentiated from those due to testing. Pre-project surface flow monitoring was started during the 2003 summer irrigation season at Dugger and Johnson Spring-Creeks in the form of a continuous.

Sampling Parameters

Sampling methods are specified in the following sections. The chemical monitoring parameters are to be conducted on a two-tiered system. Level 1 monitoring will be conducted during all three water quality-monitoring events (each recharge period). Consistently elevated concentrations of nitrate will be initiate the level 2 chemical analysis. Samples will be tested for chemicals in the level 2 list. Operation of the recharge project will depend on the absence/presence of the chemical parameters on this list. ATTACHMENT 5B describes the specific method and documents used to determine the level 1 and 2 chemical parameters (pesticides, herbicides, insecticides, fungicides, etc.) listed below.

Monitoring is proposed for the following parameters:

Physical Parameters (all monitoring types)

Static water level (in observation and WWBWC network well)

Standard field parameters, including pH, turbidity, electrical conductance, and temperature

Flow (in cubic feet per second)

Chemical Parameters –Level 1 (On-site monitoring only)

Total nitrogen as nitrate (screening parameter for Level 2 Chemical screening)

TKN

Total dissolved solids

Chemical oxygen demand

Chloride

Orthophosphate

Fecal Coliforms (Presence/absence only)

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Chemical Parameters –Level 2 (On-site monitoring only)

Rubigan (Fenarimol)

Ridomil (Metalxyl)

Systhane/Rally (Myclobutanil)

Devrinol (Napropamide)

DDD-DDE-DDT

Elgetol (DNOC sodium salt)

Alar/B-Nine (Daminozide)

Lindane (Lindane)

Sampling dates will be coordinated for all monitoring points used in the project.

This list of analytes was selected to optimize routine sampling to address constituents commonly of concern (nutrients and salt) and provide prompt indication of potential impacts by analyzing for anions (nitrate and chloride) that are known as groundwater tracers (DEQ, 1995). Additional parameters will be proposed for future sampling if the results of the initial proposed sampling indicate this is necessary.

Sampling Procedure
Equipment and sampling procedures proposed for recharge test monitoring are provided in the following sections.

Equipment
This section lists the equipment for groundwater monitoring.

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Submersible pump (*Grundfos* or similar) or dedicated bailers/sampling line

Temperature measuring instrument (*Vemco* data logger)

pH and conductivity meter(s) with calibration reagents

Water level and flow meters (*Tru-traks, In-situ Mini-trolls, Stevens 420 loggers,* 0.01 foot resolution required)

Shipping cooler with ice packs or ice

Five-gallon pail marked at the 5-gallon level, stopwatch

Laboratory supplied sample containers with appropriate preservatives

Tap water, deionized water, phosphate-free soap, cleaning brushes, field note book, log sheets

Water Level
An electronic water level meter will be used to measure the depth to groundwater in each observation well to the nearest 0.01 foot. Static water levels must be measured at the indicated reference point prior to purging any water from the well. The reference points will be on the top of the observation well casings. The static water levels in all wells should be measured on the same day for each site. Coordination with quarterly sampling of other wells in the vicinity should be attempted. Accumulation of sediment in the well should also be checked by lowering a weighted tape to the bottom of the well, reading the depth at the well casing's reference point, and comparing this value to the as-built well depth.

Decontamination

All non-disposable field equipment that may potentially come in contact with any soil or water sample shall be decontaminated in order to minimize the potential for cross-contamination between sampling locations. Thorough decontamination of all sampling equipment shall be conducted prior to each sampling event. In addition, the sampling technician shall decontaminate all equipment in the field as required to prevent cross-contamination of samples collected in the field. The procedures described in this section are specifically for field decontamination of sampling equipment. At a minimum, field-sampling equipment should be decontaminated following these procedures:

1. Wash the equipment in a solution of non-phosphate detergent (Liquinox® or equivalent) and distilled/deionized water. All surfaces that may come in direct contact with the samples shall be washed. Use a clean Nalgene and/or plastic tub to contain the wash solution and a scrub brush to mechanically remove loose particles. Wear clean latex or plastic gloves during all washing and rinsing operations.
2. Rinse twice with distilled/deionized water.
3. Dry the equipment before use, to the extent practicable.

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Purging and Field Parameters (On site wells only)

Sufficient water will be purged to ensure that the sample collected represents water from the geological formation. Borehole volumes are calculated as the volume of water in the casing and the volume of water in the filter pack.

During purging, measure pH, temperature, and electrical conductivity of the water removed. At a minimum, these parameters are measured at the start of purging and after each successive borehole volume is removed. Temperature should be measured first because it changes most rapidly. Purging continues until at least three borehole volumes have been purged and the field parameters are established to within ± 10 percent over three consecutive measurements. At this point, the observation well is considered adequately purged and can be sampled.

Occasionally, observation wells installed in low permeability formations may be purged nearly dry (within 6 inches of bottom of well) prior to stabilization of groundwater parameters and prior to purging at least three borehole volumes. If this happens at least one set (more if possible) of purge water groundwater parameters (pH, temperature, EC) need to be measured. Sample collection can be done after the water level has recovered at least 75 percent of the drawdown ensuring most of the well water is from the formation. Prior to groundwater sample collection several measurements are required as explained above. These include static water level and total depth, pH, temperature, and electrical conductivity.

All field instruments should be calibrated each day prior to sample collection. Instrument calibration and maintenance should precisely follow the manufacturers recommended procedures. Electrical conductivity and pH standards used to calibrate the instruments should be within the range encountered at the monitoring sites. Calibration records should be recorded on the sample collection forms.

Water Sampling

Samples will be collected after sufficient water has been purged according to the procedure described above. Samples will be collected from the discharge end of the pump hose after the flow rate has been reduced to less than approximately 0.2 gallons per minute. Discharge from a bailer should be controlled to minimize agitation and aeration. Sample containers should be sealed with tape, labeled, and immediately placed in a cooler with ice. Sample containers should be filled completely to eliminate head space. Sample containers should be provided by the analytical laboratory and should be requested at least one week in advance of the sampling. The containers should be appropriate for

the parameters analyzed and all shipping coolers should have chain-of-custody seals placed on them prior to shipping.
One additional sample should be collected from one of the sample points for quality control purposes. This sample should be evaluated as a "blind duplicate."
Sample Preservation and Holding Time. Samples should be stored immediately after collection in an ice chest containing sufficient ice to cool the samples to 4 degrees Celsius (°C). Use "blue ice" if possible. If water ice must be used, the ice should be sealed in plastic bags, as should the sample bottles. Samples should remain cooled at 4°C and delivered to the laboratory within 24 hours of collection. Sample receipt at the laboratory must be sooner if analysis includes parameters with a shorter holding time. Care should be taken to prevent excessive agitation of samples or breakage/leakage of containers. Samples should be analyzed within the specified holding time for each constituent.

Resampling
In accordance with OAR 340-40-030(5), resampling is done if monitoring indicates a significant increase (or decrease for pH) in the concentration of a monitored parameter at a sampling point. Determining if a significant increase in parameter concentration has occurred is customarily done either by assessing concentrations in relation to established concentration limits or by using a statistical analysis. Since background or baseline conditions have yet to be established for the test site a concentration limit has not been set and insufficient data exists upon which to base a statistical analysis. The criteria to guide resampling decisions will be reevaluated is subsequent test project annual reports.

Chain of Custody and Sample Handling
A chain-of-custody form should be completed and signed by the sampler on the day samples are collected. The chain-of-custody form must be signed by laboratory personnel upon receipt and any other individuals that maintain custody of the samples in the interim. Coolers should be sealed and shipped or driven to the lab as soon as possible. The method of shipping (bus, next day air, etc.) is usually determined by the parameter having the shortest holding time. In any case, shipping times of more than 24 hours should not be used as the cooler(s) may warm and compromise sample quality.

Field Records and Data Validation
All field notes, analytical results, and other pertinent data associated with the project should be maintained in a secure location and be archived for at least a five-year period. Data validation for both field and lab Quality Assurance and Quality Control (QA/QC) will be performed using a checklist. All pertinent information with respect to QA/QC will be checked.
The following items are included on the QA/QC review checklist:

1. Field data sheets (or notebooks) and observations (observations are used to check for potentially erroneous data) will be reviewed to make sure they are completely filled out.

2. Chain-of-custody forms will be completed, being signed by all sample handlers.

3. Holding times for all constituents will be met.

4. Field blind duplicate results will be evaluated to make sure they are compatible.

5. Laboratory method blanks, matrix spike, matrix spike duplicates, and surrogate percent recovery data supplied by the analytical laboratory will be evaluated to make sure they are compatible.

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Data Reporting and Statistical Analysis
The following procedures for reporting analysis are proposed for this project.

Record Keeping
All field notes, laboratory results, critical calculations, and published reports will be maintained at the WWBWC office for a period of five years following completion of the final testing and monitoring report. If possible, both paper and electronic copies will be maintained.

Evaluation
Monitoring data and observations should be evaluated when they are received from the sampler and laboratory.

Materials to be received include:
Field monitoring and sample collection records

Original laboratory reporting sheets

Data evaluation will include:

1. Verification of analytical methods and detection limits, along with the date the analysis was performed

2. Review of document handling, sampling and analytical problems, and actions taken to correct any problems

3. Summarizing water level data in tabular and/or graphical form

4. Summarizing water quality analytical results in tabular form and/or graphical form

5. Performing data validation checks, as appropriate to the data set

6. Identifying any significant increases in parameter concentrations (will be done later in project only after enough data has been collected to warrant)

Annual Review and Reporting
All monitoring activities performed during the previous monitoring year will be included in an annual report to be submitted to OWRD during the summer following the preceding seasonal recharge period. The annual report will present the following information:

Water quality data, including duplicate sample results in tabular form and time-series plots for specific parameters

Water level data, including hydrographs showing water level changes over time

Basic statistical parameters for each parameter of interest: mean, median, maximum, minimum, standard deviation, number of data points, and number of non-detects

Evaluation of all field and laboratory data, including observed changes and groundwater flow direction and gradient

Discussion and conclusions, including recommended changes to recharge testing

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The methods needed to evaluate water quality and water level data will depend on the objectives of the evaluation. In general, the principal objective is to evaluate whether or not recharge tests have affected groundwater levels and quality. Evaluation methods include: a comparison of water quality data with a concentration limit or with background water quality; comparison of water quality over time; or comparison of water quality between up-gradient and down-gradient wells. For the test site, insufficient data are available for a statistical analysis to be performed because concentration limits have not yet been established. Until that time, evaluation of dataset trends will be solely qualitative, but revisited in each annual report until a database has been compiled that is sufficient for statistical analysis.

Final Recharge Test Project Report

At the conclusion of five years of recharge testing under the limited license a final report will be prepared. The report will contain the data collected for the test project; analysis and interpretation of that data (including statistical analysis as appropriate), and a recommendation for proposed future artificial groundwater recharge activities at the test site. The report will be complete enough to serve as supplemental material to a permanent artificial groundwater recharge permit under OAR 690-350-0110, if such a permit is sought following completion of the test project.

Monitoring Plan Attachments

Attachment 5A. Methodology Water Quality Assessment and Evaluation
Attachment 5B. Figure 5A Map of On-site Recharge Well Locations
Attachment 5C Chemicals of interest for Hudson Bay Recharge Project

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Attachment 6. Site Hydrogeology, 690-350-0020(3)(b)(C), (E), and (G) (attached)

Attachment 7. Source Water Quality, 690-350-0020(3)(b)(D)

Overview

This project will utilize winter-spring flow from the Walla Walla River as the *source* water for recharge during the project operation. The time period that Walla Walla River water will be used is November 15th through May 15th. A review of existing reports and data was conducted to identify any areas of concern regarding source water quality for the recharge project. What little information that exists for source water quality conditions is discussed below.

In 2003, the WWBWC tracked turbidity levels through a winter storm event (1/27/3 through 2/3/3) and found turbidity levels to be a potential issue on the Walla Walla River (mainstem) during peak flow events (WWBWC, Unpublished data). Turbidity could be problematic for project operations, as it may act to decrease the rate of infiltration by plugging and layering the bottom of the recharge pits. Turbidity may also be a preliminary screen for fecal contamination issues, as bacteria may use the large particles as a vector for mobilization.

The other known source water quality information was obtained from the Environmental Protection Agencies STORET database. STORET provided some historical water quality data that showed several parameters (circa 1960s) that were accounted for in the recharge project's monitoring plan (ATTACHMENT 5). STORET data that was collected nearest to the source water POD at the Little Walla Walla Diversion (*NE ¼ NW ¼, Section 1, SW ¼ NE ¼ Section 12, T5N, R35E, W.M.; DIV.PT. 1*) is attached in table form as ATTACHMENT 7A.

From the review of all known source water information, the parameters that appeared to be of concern are:

1. Fecal Coliforms
2. Turbidity

There was no other relevant information found for source water quality conditions. The monitoring plan covers the establishment of source water quality conditions during operation of the recharge facility. This will insure safe water quality conditions for the recharge project.

Attachment 7A Source Water Quality Information

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Resources and References:

Cooperative Extension Washington State University. 2002. *2002 Crop Protection Guide for Tree Fruits in Washington.* Washington State University EB0419.

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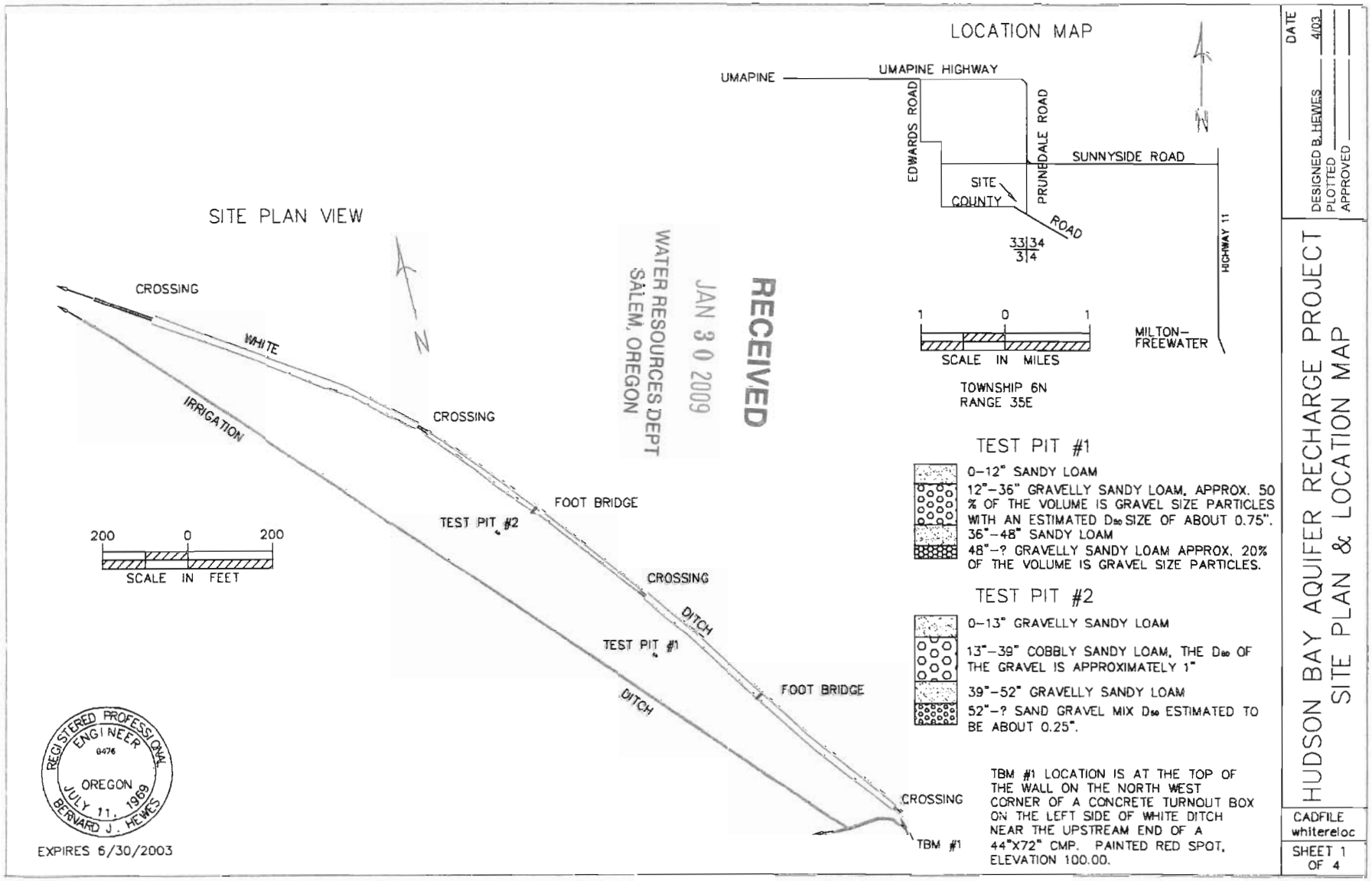
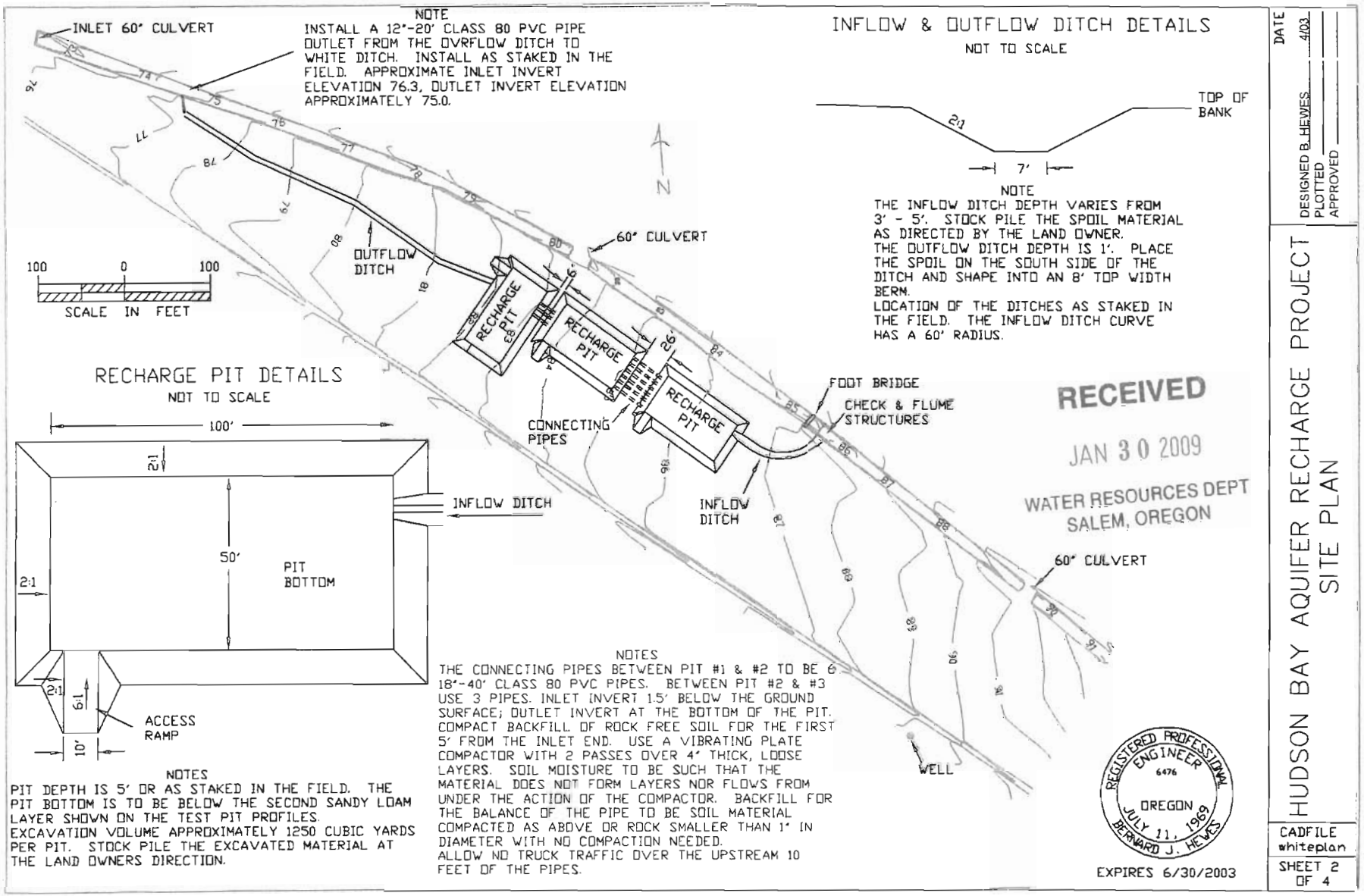
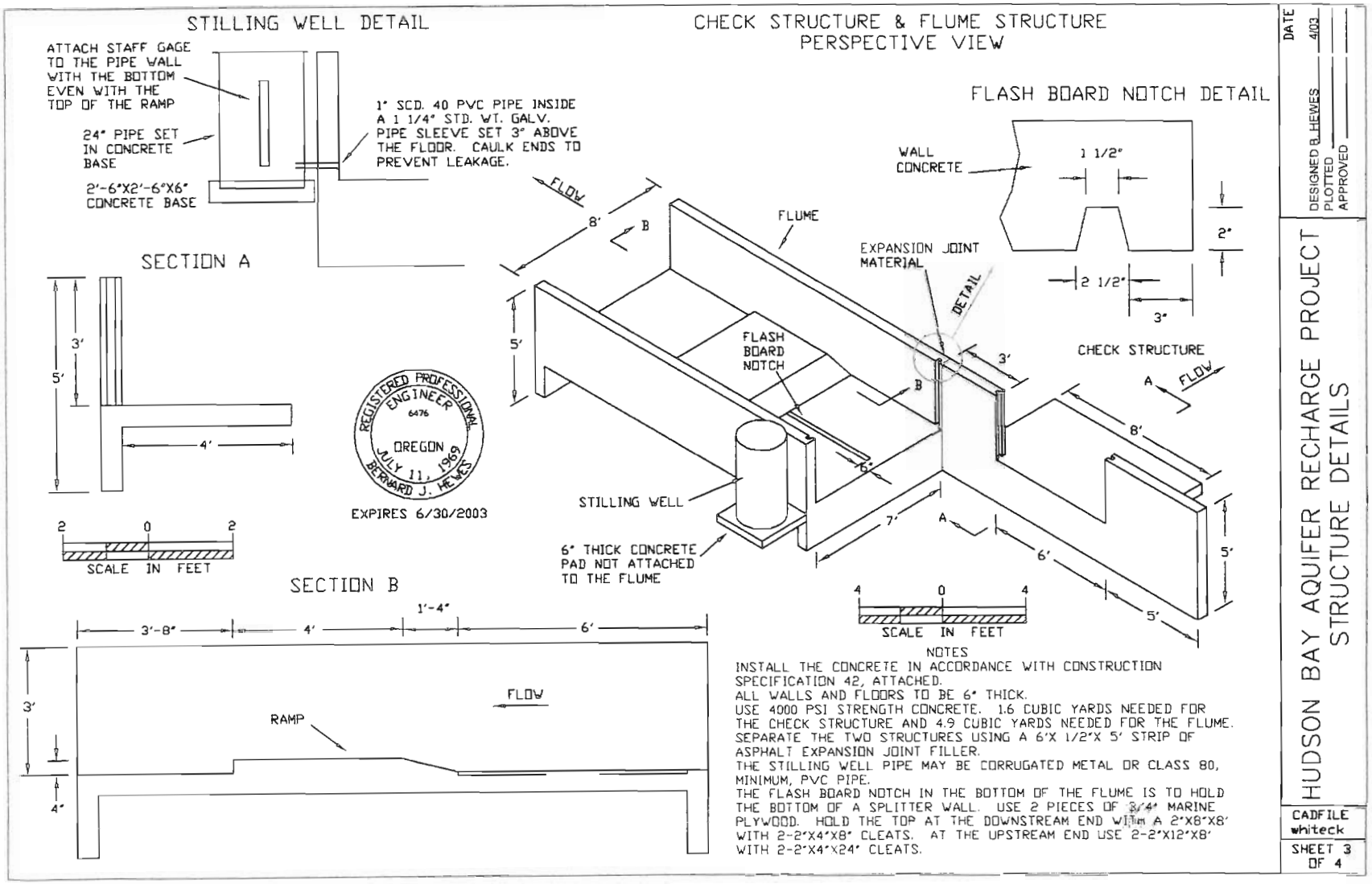
Attachments

Attachment 1A



Attachment 1 B





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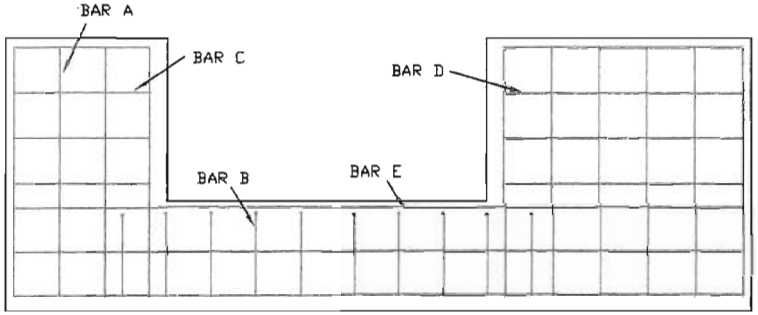
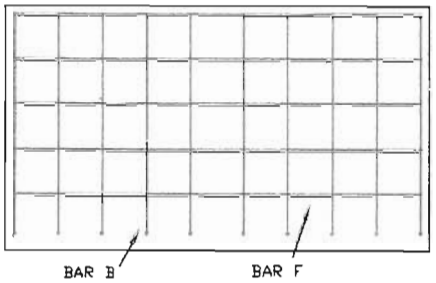
CHECK STRUCTURE ELEVATION VIEW



APRON PLAN VIEW



REINFORCING STEEL SCHEDULE

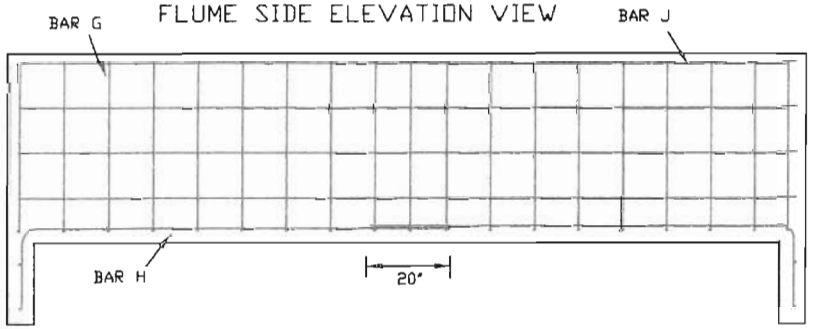
BAR	NO.	SHAPE	A	B	C
		CHECK			
A	10	STRAIGHT	4'-7"	-	-
B	10	A B	1'-7"	4'-1"	-
C	4	STRAIGHT	2'-6"	-	-
D	4	STRAIGHT	4'-6"	-	-
E	3	STRAIGHT	13'-8"	-	-
F	5	STRAIGHT	7'-8"	-	-
		FLUME			
G	19	A B C	3'-1"	7'-6"	3'-1"
H	20	A B	1'-6"	8'-1"	-
I	4	STRAIGHT	7'-6"	-	-
J	8	STRAIGHT	14'-6"	-	-

NOTES
ALL BARS TO BE NUMBER 4.
BARS TO BE PLACED IN THE CENTER OF THE WALLS AND FLOOR.
NEED 820 LINEAL FEET OF REINFORCING BARS WITHOUT ANY WASTE.

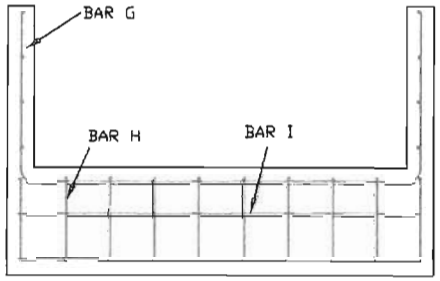
REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2003

FLUME SIDE ELEVATION VIEW



FLUME END WALL ELEVATION VIEW



DATE 4/03
DESIGNED B. HEWES
PLOTTED
APPROVED

HUDSON BAY AQUIFER RECHARGE PROJECT
STRUCTURE REINFORCING STEEL

CADFILE whiteckst

SHEET 4 OF 4

Attachment 1E

HUDSON BAY AQUIFER RECHARGE PROJECT

ENGINEERING REPORT

This project entails diverting water from an existing irrigation ditch to three pits to be excavated for the purpose of infiltrating the water into the shallow aquifer. Project features include a concrete check structure in the existing White Ditch, a concrete flow measuring flume, an open ditch, three excavated pits, pipes connecting the pits and an outflow ditch from the down stream pit.

These items were sized to handle 50 cubic feet per second (cfs) of water. This is the amount anticipated will be available from excess flow in the Walla Walla River and that the Hudson Bay District is able to deliver.

Data gathered to design the project consisted of a site topographic survey and installing two sites for testing the water infiltration capacity of the natural materials and determining the layers in the soil profile. In addition the Soil Survey of Umatilla County Area, Oregon was consulted. This is a US Dept. of Agriculture, Natural Resources Conservation Service publication giving general soils information.

The topographic survey data was used to prepare a topographic map with one foot contour intervals at a scale of 1" = 60'. This information was used to help determine the location of the project features.

Two test pits were excavated to a depth of 6'-7' each. A 24" diameter by 5' long section of corrugated metal pipe was set on end in the bottom of the pit and about one foot of fill placed around it to hold it in place. Water was pumped into the pipe at a rate that would sustain a water depth of one foot in the pipe. Both flow rate and total flow was measured. The test was run for 6.25 hours in the first pit and 3.5 hours for the second pit.

PIT #1
Soil profile:
0-12" sandy loam
12"-36" gravelly sandy loam, approximately 50% of the material volume is gravel size particles with an estimated D_{50} size of about 0.75"
36"-48" sandy loam, in parts of the trench this layer does not exist
48"-?" gravelly sandy loam approximately 20% of the volume is gravel size particles

The inflow rate at the end of the test period was 4.0 gallons per minute (gpm). This resulted in an infiltration rate of 1.7 gpm/sq. ft./ foot of head.

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PIT #2
Soil profile:
0"-13" gravelly sandy loam
13"-39" cobbly sandy loam, the D_{50} of the gravel is approximately 1"
39"-52" gravelly sandy loam
52"-? sand gravel mix D_{50} estimated to be about 0.25"

In this pit the inflow rate of 11.9 gpm was maintained for 3.5 hours and at no time did water puddle in the bottom of the pipe. The infiltration rate is in excess of 3.8 gpm/sq. ft.

The area needed for infiltrating the water was determined assuming an infiltration rate for the entire area of 3.0 gpm/sq.ft./ per foot of head. For an inflow rate of 50 cfs the infiltration area needs to be 7480 square feet. The infiltration rate of 3.0 gpm/sq.ft. was chosen because the pits will be located in the area with soil surface texture similar to test pit #2.

Due to the possibility of fine soil particles plugging the infiltration area, unknowns concerning the long term infiltration rate and that the amount of water available is not yet known extra infiltration area is being provided. Three separate pits with bottom dimensions of 50 feet X 100 feet are proposed. This will provide an infiltration area of 15,000 square feet.

The pits will be excavated to a depth of about 5 feet to get below the second sandy loam layer noted in both test pits. This will allow the water depth to be 2.5 feet - 3.5 feet. That will increase the rate of infiltration over the test values derived with one foot of water depth. The overall safety factor for the infiltration area is well over 2.

Inflow to the system will be measured with a ramp flume and continuously recorded. The ramp flume is sized to provide 5% flow rate accuracy over a flow range of 10 cfs-50 cfs

Any outflow from the last pit will be safely returned to the White Ditch through a 12-inch pipe. The pipe will be on a slope that will keep water from flowing out of White Ditch.

By: Bernard J. Hewes Date: 8/21/03
Bernard J. Hewes

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Attachment 3A

LAND USE INFORMATION SHEET

This information is needed to determine if the proposed project complies with statewide planning goals and is compatible with local comprehensive plans (ORS 192.180)

CITY/COUNTY LAND USE INFORMATION (to be completed by local planning official):

Please check below the one that applies! Recharge - Hudson Bay project

☐ This project is not regulated by the local comprehensive plan and zoning ordinance.

☒ This project has been reviewed and is compatible with the local comprehensive zoning ordinance. (Please cite appropriate plan policies, ordinance section, and case numbers.) 152.056

☐ This project has been reviewed and is not compatible with the local comprehensive plan and zoning ordinance. (Cite appropriate plan policies, ordinance section, and case numbers).

☐ Compatibility of this project with the local planning ordinance cannot be determined until the following local approvals are obtained:

_____ Conditional Use Permit
_____ Plan Amendment
_____ Other
_____ Development Permit
_____ Zone Change

An application has ___ has not ___ been made for the local approvals checked above.

* Signature of Local Official: Patty Perry

Title: Senior Planner Date: 5-27-03

Must be authorized signature from your local City/County Planning Department

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ATTACHMENT 5A: Methodology to Determine Chemical Constituents for Water Quality Assessment and Evaluation

Introduction:

The Artificial Groundwater Recharge rules (OAR 690-350-120) require both up front water quality and a water quality-monitoring plan. Further, for any recharge project the rules (OAR 690-350-120 (3) (b) require an applicant to either obtain a water quality permit (typically a water pollution control facility (WPCF) permit) or show that a permit is not necessary. Also, rules OAR 690-350-120 (3)(g) require a "Project Description Report" (ATTACHMENT 5) that outlines the proposed groundwater quality-monitoring plan. This attachment is intended to specifically help clarify the method by which the list of chemical constituents was determined.

Project Area Sample Chemical Review Methodology

Working with Tom Darnell, OSU Extension agent in Milton-Freewater, a chemical constituents review was conducted in order to determine what types of chemicals should be examined in the surface and groundwater monitoring for the project. Several steps were followed to determine which chemicals were of interest.

Review Steps

1. Reviewed the ODEO Report: *April 1999 Milton-Freewater Groundwater Quality Study: As part of the Statewide Groundwater Monitoring Program* (Richardson, et. al., 2000). Particular attention was focused on the constituents tested, testing protocol and timing, and the results-conclusions.
2. Reviewed *OSU Extension Pesticide Properties Database* and determined which were used in the Milton-Freewater area and a list was comprised. (Table 4A1, 4A2)
3. Determined which were currently and/or historically used in the area utilizing past chemical studies in the basin (see references). This included interviewing the current landowner on the site-specific history of chemical use on that property (see signed written statement below).
4. Determined which chemicals were important to monitor for during the recharge period (winter-spring). Considered each chemical's typical seasonal application period, solubility in water, soil half-life, and soil movement ratings.
5. Considered project design (top soil removed), and finalized list of chemicals of interest.

Final List of Chemicals to Monitor for Recharge Project

Chemicals Currently Used:

Rubigan (Fenarimol)
Ridomil (Metalxyl)
Systhane/Rally (Myclobutanil)
Devrinol (Napropamide)

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Chemicals Historically Used:

DDD-DDE-DDT
Elgetol (DNOC sodium salt)
Alar/B-Nine (Daminozide)
Lindane (Lindane)

Laboratory Resources

Nitrate Analysis:	Walla Walla County-City Health Department 310 W. Popular, P. O. Box 1753 Walla Walla, WA 99362 Telephone (509) 527-3290
Chemical Analysis:	KUO Testing Labs, INC. 337 south 1st Avenue Othello, WA 99344 Telephone: (509)-488-0118

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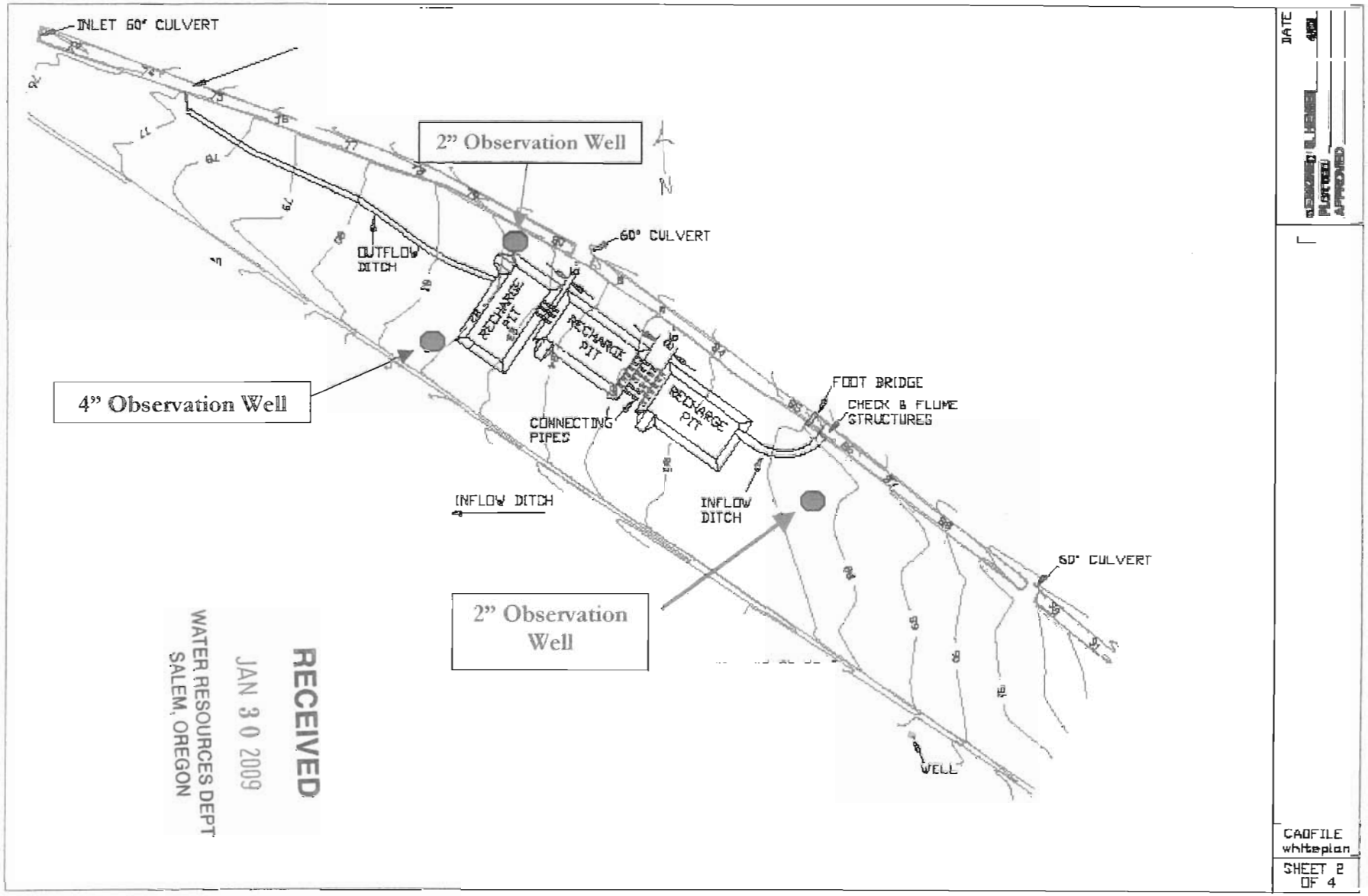
Attachment 5B Map of On-Site Monitoring Well Locations



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Attachment 5D

History of Chemical[1] Use: Recharge Site Specific

Landowner Statement of Past Use:

"Gentleman,

I have been the owner of a certain parcel of land in the valley with an address known as 84140 Prunedale Rd., Milton-Freewater, Oregon, 97862.

I have owned this land since 1978 at which time we took over the existing orchard of apples and farmed it for two years at which time we began removing various blocks of tress and replanting with new varieties. In the past few years we raised Nursery Tree Stock and began leveling the land to its present condition, letting it lay in a dormant stage for a year and then planting cover crops to enrich the soil for a future cherry orchard.

The pesticides applications were the normal tree fruit pesticides as allowed by regulations of the industry. The herbicide applications were Round-Up, Simizine and Paraquat. No other chemicals were used on this parcel of land during my ownership. If you should have other questions, please contact me at the following: (541)-278-6305, (509)-386-6175, or (541)-558-3752 or e-mail at:
Hjohnson@co.umatilla.or.us"

Landowner: _____ Date: 10-17-03

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[1] Chemical is defined here to include insecticides, fertilizers, herbicides, rodenticides, fungicides, and all other non-natural chemicals.

ATTACHMENT 7A: Source Water Quality Data

1STORET RETRIEVAL DATE 99/06/23
402388 28AWALL03780
46 01 08.6 118 24 45.1 4
WALLA WALLA RIVER AT HWY 11 (MILTON-FREEWATER)
41059 OREGON UMATILLA
PACIFIC NORTHWEST 131007
COLUMBIA RIVER BASIN BELOW YAKIMA RIVER
21400000 17070102007 00
0000 FEET DEPTH

Grey areas samples that correspond to Recharge Project

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INITIAL DATE	67/04/24	67/08/21	67/12/11	68/04/02	68/08/05	68/12/16	69/03/04	69/12/10	70/04/28
INITIAL TIME	1235	1400	1440	1615	1750	1100	1510	1145	930
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	8	25.5	7	8.5	25	5	8.6	5	6
00011 WATER TEMP FAHN	46.4$	77.9$	44.6$	47.3$	77.0$	41.0$	47.5$	41.0$	42.8$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU	250	2		10	3	8		7	1
00080 COLOR PT-CO UNITS	20	4		3	5	3		1	3
00095 CNDUCTVY AT 25C MICROMHO	67	225	200	72	243	69	95		71
00300 DO MG/L	10.3	12.2	10.6	11.4	10.7	12.2	11.6	11.7	12.7
00301 DO SATUR PERCENT	89	150	89	99	131	95	99	94	105
00310 BOD 5 DAY MG/L	0.7	1.3	0.9	0.5	1.3	1.6	0.8	1.5	1.5
00400 PH SU	7.3	8.3	7.7	7.5	8.40L	7.2	7.6	7.5	7.5
00410 T ALK CACO3 MG/L	30	108		33	105	30		54	31
00500 RESIDUE TOTAL MG/L	518			99	184	101		118	87
00530 RESIDUE TOT NFLT MG/L	368	11		10	10	21		18	12
00610 NH3+NH4- N TOTAL MG/L	0.13	0.34		0.38	0.32	0.17		0.08	0.12
00612 UN-IONZD NH3-N MG/L	.0004$	.036$		.002$	.040$	.0003$		.0003$	.0005$
00619 UN-IONZD NH3-NH3 MG/L	.0005$	.043$		.002$	.049$	.0004$		.0004$	.0006$
00620 NO3-N TOTAL MG/L	0.03	0.02		0.07	0.38	0.54		0.73	0.13
00660 ORTHOPO4 PO4 MG/L	0.06	0.16		0.1	0.18	0.56		0.16	0.03
00760 SWL PBI MG/L	1K	1K	29	1K					
00940 CHLORIDE TOTAL MG/L	2			1	8	2		2	1
00945 SULFATE SO4-TOT MG/L	8	33		4	14	4		6	3
22413 HARDNESS TOTLDISS WTR MG/L	28			37	99	35		49	24
31505 TOT COLI MPN CONF /100ML	620	2400	7000	60	230	2300	620	450K	620
31615 FEC COLI MPNECMED /100ML			230						60
31677 FECSTREP MPNADEVA /100ML								240	

ATTACHMENT 7A: Source Water Quality Data

INITIAL DATE	70/07/13	70/11/30	71/05/11	71/08/16	72/02/28	72/08/30	73/02/12	73/06/13	73/09/24
INITIAL TIME	1400	1645	2000	1620	1610	1130	845	1055	1400
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	24	5.5	15.5	26	9	20.5	2.5	16.5	16
00011 WATER TEMP FAHN	75.2$	41.9$	59.9$	78.8$	48.2$	68.9$	36.5$	61.7$	60.8$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU		5	3	1	28	2	15	3	2
00080 COLOR PT-CO UNITS		0	1	2	10	5	5	5	0
00094 CNDUCTVY FIELD MICROMHO							90		
(SAMPLE CONTINUED FROM PREVIOUS PAGE)									

INITIAL DATE	70/07/13	70/11/30	71/05/11	71/08/16	72/02/28	72/08/30	73/02/12	73/06/13	73/09/24
INITIAL TIME	1400	1645	2000	1620	1610	1130	845	1055	1400
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00095 CNDUCTVY AT 25C MICROMHO	236	66	51	200	67	221	87		
00300 DO MG/L	12.5	11.5	9.5	14.2	11	12.5	12.9	11.7	11.5
00301 DO SATUR PERCENT	151	95	99	172	97	137	97	117.0$	115.0$
00310 BOD 5 DAY MG/L	2	0.7	0.8	2.3	0.7	0.9	1.4		
00400 PH SU	8.6	7.5	7.3	8.9	7.1	8.4	7.3		
00410 T ALK CACO3 MG/L		29	21	96	23	92	29	82	95
00500 RESIDUE TOTAL MG/L		89	75	172	280	170	100	153	164
00530 RESIDUE TOT NFLT MG/L		12	12	4	106	8	32	10	3
00610 NH3+NH4- N TOTAL MG/L		0.34	0.06	0.66	0.09	0.14	0.04	0.1	0.17
00612 UN-IONZD NH3-N MG/L		.001$	.0003$	.215$	.0002$	.013$	.00008$		
00619 UN-IONZD NH3-NH3 MG/L		.002$	.0004$	.261$	.0002$	.016$	.00010$		
00620 NO3-N TOTAL MG/L		0.02	0.1	0.15	0.3	0.51	0.14	0.36	0.39
00625 TOT KJEL N MG/L							0.2		
00650 T PO4 PO4 MG/L							0.3		
00660 ORTHOPO4 PO4 MG/L		0.06	0.09	0.13	0.09	0.04	0.09	0.1	0.14
00930 SODIUM NA,DISS MG/L					2.4		2.8		
00935 PTSSIUM K,DISS MG/L					2		1.5		
00940 CHLORIDE TOTAL MG/L		1	0.7	5	0.8	3	1	6	4
00945 SULFATE SO4-TOT MG/L		3	.1K	11	3	11	2	6	4
22413 HARDNESS TOTLDISS WTR MG/L		26	19	80	22	84	28	71	79
31505 TOT COLI MPN CONF /100ML	230	2400	2400	230	620	620	290		
31615 FEC COLI MPNECMED /100ML	230	45K	45K	45K	45K		60		

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ATTACHMENT 7A: Source Water Quality Data

1STORET RETRIEVAL DATE 99/06/23
402389 28AWALL04860
45 54 13.6 118 22 02.9 4
WALLA WALLA RIVER U/S MILTON-FREEWATER
41059 OREGON UMATILLA
PACIFIC NORTHWEST 131007
COLUMBIA RIVER BASIN BELOW YAKIMA RIVER
21400000 17070102011 00
0000 FEET DEPTH

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INITIAL DATE	67/04/24	67/08/21	67/12/11	68/04/03	68/08/06	68/12/16	69/03/04	69/12/10
INITIAL TIME	1300	1520	1700	810	905	1030	1540	1055
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	6	21	5	6.5	16	5	6.4	3
00011 WATER TEMP FAHN	42.8$	69.8$	41.0$	43.7$	60.8$	41.0$	43.5$	37.4$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU	5	7	15	2	5	9	12	2
00080 COLOR PT-CO UNITS	6	2	4	4	4	3	2	0
00095 CNDUCTVY AT 25C MICROMHO	59	180	69	57	93	57	63	
00300 DO MG/L	11.2	8.7	11.9	11.6	9.7	11.1	11.6	12.9
00301 DO SATUR PERCENT	94	101	98	98	102	87	99	100
00310 BOD 5 DAY MG/L	0.6	0.8	1.1	0.6	0.4	0.2	0.7	1.2
00400 PH SU	7.4	7.5	7.5	7.3	7.3	7	7.5	7.7
00410 T ALK CACO3 MG/L	26	32	32	26	40	16	27	33
00500 RESIDUE TOTAL MG/L	89	101	83	113	98	92	81	67
00530 RESIDUE TOT NFLT MG/L	2	8	6	7	22	26	7	6
00610 NH3+NH4- N TOTAL MG/L	0.14	0.17	0.32	0.12	0.18	0.11	0.06	0.03
00612 UN-IONZD NH3-N MG/L	.0005$	.002$	.001$	.0003$	.001$	.0001$	.0003$	.0002$
00619 UN-IONZD NH3-NH3 MG/L	.0006$	.003$	.002$	.0004$	.001$	.0002$	.0003$	.0002$
00620 NO3-N TOTAL MG/L	0.01	0.02	0.02	0.03	0.04	0.39	0.3	0.12
00660 ORTHOPO4 PO4 MG/L	0.02	0.1	0.1	0.07	.01K	0.01	0.11	0.1
00760 SWL PBI MG/L	8	1K	1					
00940 CHLORIDE TOTAL MG/L	1	5	1	1	6	2	2	0.8
00945 SULFATE SO4-TOT MG/L	3	0.6	4	2	15	3	1	3
22413 HARDNESS TOTLDISS WTR MG/L	23	36	29	24	32	25	26	31
31505 TOT COLI MPN CONF /100ML	230	620	210	230	620	210	60	60
31615 FEC COLI MPNECMED /100ML			210					
31677 FECSTREP MPNADEVA /100ML								5K

ATTACHMENT 7A: Source Water Quality Data

INITIAL DATE	74/05/06	74/07/30	74/11/11	75/05/27	75/07/08	75/11/10
INITIAL TIME	1420	1745	1630	1930	1745	1745
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	10.5	20.5		10.5	27	4.7
00011 WATER TEMP FAHN	50.9$	68.9$		50.9$	80.6$	40.5$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10
00070 TURB JKSN JTU	7	2	1	1	2	1.0K
00080 COLOR PT-CO UNITS	5	5	1K	5	15	1K
00094 CNDUCTVY FIELD MICROMHO	49	80		55	170	80
00095 CNDUCTVY AT 25C MICROMHO	53	90		54	195	72
00300 DO MG/L	10.8	9		10.8	8.7	11.9
00301 DO SATUR PERCENT	101	103		102	106	95
00310 BOD 5 DAY MG/L	1	0.3		0.6	3	0.4
00400 PH SU	7.5	8		7.3	8	7.7
00410 T ALK CACO3 MG/L	17	34	33	20	65	34

INITIAL DATE	74/05/06	74/07/30	74/11/11	75/05/27	75/07/08	75/11/10
INITIAL TIME	1420	1745	1630	1930	1745	1745
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER
00500 RESIDUE TOTAL MG/L	62	76	68	64	180	87
00530 RESIDUE TOT NFLT MG/L	39	4	1K	5	38	3
00610 NH3+NH4- N TOTAL MG/L	0.03	0.02	0.06	0.01	0.19	0.02
00612 UN-IONZD NH3-N MG/L	.0002$	.0008$		.00004$	.012$	.0001$
00619 UN-IONZD NH3-NH3 MG/L	.0002$	.0010$		.00005$	.014$	.0001$
00620 NO3-N TOTAL MG/L	0.01	0.05	0.06	0.1	0.72	0.12
00650 T PO4 PO4 MG/L	0.2	0.2		0.3	0.5	0.1
00660 ORTHOPO4 PO4 MG/L	0.01	0.14	0.08	0.09	0.08	0.11
00930 SODIUM NA,DISS MG/L	2.1	3		2.4	8.4	3
00935 PTSSIUM K,DISS MG/L	1.6	2.4		1.3	3.5	2
00940 CHLORIDE TOTAL MG/L	0.4	0.9	1	1	6	1
00945 SULFATE SO4-TOT MG/L	2	1	2	2	8	2
22413 HARDNESS TOTLDISS WTR MG/L	14	27	27	19	60	27
31505 TOT COLI MPN CONF /100ML	60	7000L		230	7000	2400
31615 FEC COLI MPNECMED /100ML	45K	620		45	7000	230

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LAND LEASE

1. PARTIES

The parties to this Lease are HULETTE M. JOHNSON, SHIRLEY A. JOHNSON, and H. MARC JOHNSON, hereinafter referred to as Landlord, and HUDSON BAY DISTRICT IMPROVEMENT COMPANY, and Oregon Non-profit Improvement District, hereinafter referred to as Tenant.

2. DATE

This Lease will begin the first of the following month, after the Tenant has obtained a water right certificate for the purpose of ground water recharge for this site from the State of Oregon.

3. DESCRIPTION OF LEASED PREMISES

Landlord leases to Tenant and Tenant leases from Landlord, under the terms and conditions stated herein, the real property in Umatilla County, State of Oregon, described in Exhibit "A" attached hereto and by such reference incorporated herein.

4. TERM OF LEASE

The term of this Lease will be from the date of this lease for a period of five(5) years. Tenant shall have the option to renew this lease with notice to Landlord of not less than 90 days prior to the end of the initial term and any renewal terms for future additional five year terms upon the mutual agreement of renegotiated rental terms for each renewal period.

5. POSSESSION

The Tenant shall be granted possession of the property upon execution of this document by all parties, together with the receipt of the initial lease payment as prescribed in RENT.

6. RENT

Tenant shall pay advance annual rent payments in the amount of three thousand six hundred dollars($3,600) plus annual assessment for irrigation water for surface water rights delivered by Tenant to 84140 Prunedale Road, beginning with INV # 1276C for 2003. Landlord shall pay same assessment to Tenant upon receipt of said annual assessment payment from Tenant. Tenant shall make each annual payment for the term of this lease to Landlords address, 52833 Sunquist Road, Milton-Freewater, Oregon, 97862, or otherwise as notified. The initial payment shall be due on the date this agreement is executed by Tenant and Landlord, and Tenant it therefore granted possession to said real property.

7. INSURANCE

Tenant shall maintain liability insurance on the leased property in an amount acceptable to the Landlord and shall provide proof of such insurance naming Landlords as additional insureds. Tenant shall also be responsible for necessary insurance on laborers. Tenant shall also be responsible for insurance coverage on personal property kept or installed upon this leased premises.

8. USE OF PREMISES

Tenant agrees that they will use the property for ground water recharge/storage, ponding.

9. LANDLORDS OBLIGATIONS

Landlord shall install electricity, pump, collection pond and mainline with the assistance of Tenant necessary to connect the source of irrigation water provided by Tenant to the existing delivery systems of Landlord's.

If there is a mortgage or other encumbrance on said premises, Landlord covenants to keep same in good standing, at all times, to make payments when due and not to suffer or permit default in said encumbrance.

Landlord shall pay all property taxes upon the real property subject to this lease in a timely manner.

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10. TENANT'S OBLIGATIONS

Tenant shall provide all labor and materials for the construction of the ground water recharge pond, Landlord's irrigation collection pond and pumping station or other improvements required by Tenant, including maintenance of bridges and culverts.

Tenant shall pay all taxes of any kind and necessary insurance for labor to maintain to maintain improvements including any increase in property taxes as a result of said improvements as made by Tenant.

Tenant shall pay for all maintenance and operation of improvements constructed on said premises.

Tenant agrees that earth material excavated from the recharge pond shall be placed along the edges of the recharge area to produce a basin-like pond. Excess material shall be placed in other areas of Landlords property as directed by Landlord and spread evenly where located so that agricultural activities may continue.

Tenant upon termination of lease, shall replace all soil to a level topography using stored material from the sides of said 'recharge' pond, together with other off site soil as approved by Landlord, necessary to return the recharge pond to a level premise ~~for agricultural growing activities.~~

Tenant shall pay for all costs incurred for control of noxious weeds and vegetation around perimeter of ponding areas, and shall spray the perimeter of said pond including the banks of the Hudson Bay Canal and the Pleasantview Canal including bridges and culverts to maintain a clean ground cover as directed by Landlord

Tenant shall provide signage for trespass prevention and notice of man-made hazard upon premises at the commencement of work efforts at the recharge area.

Tenant shall install any and all fences and gates necessary as may be required by an insurance company or others around the recharge pond.

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11. LIENS

Tenant shall pay, as due, all claims for work done on and for services rendered or materials furnished to the leased premises incurred and owing by Tenant and shall keep the premises free of any liens resulting from acts of the Tenant.

12. COVENANTS OF TITLE

Landlord covenants that he is the owner of the above described property free of any encumbrance that would impair or interfere with Tenant's rights under this Lease, and that Landlord has full right and authority to lease the premises described herein.

13. WASTE

Tenant shall not commit or permit to be committed any waste, strip, damage to or misuse of the premises.

14. INDEMNIFICATION

Tenant shall indemnify, hold harmless and defend Landlords from all claims, loss or liability arising out of or related to any activity of Tenant on the leased premises or any condition of the leased premises in the possession or under the control of the Tenant.

15. ASSIGNMENT

No part of the leased property may be assigned, mortgaged, or subleased, nor may a right of use of any portion of the property be conferred on any third person by any other means without the prior written consent of Landlord. This provision shall apply to all transfers to and by trustees in bankruptcy, receivers, administrators, executors, and legatees. No consent in one instance shall prevent the provision from applying to a subsequent instance.

16. DEFAULT

The following shall be events of default:

Failure to pay rent when due.

Failure of either Landlord or Tenant to comply with any other term or condition or fulfill any other obligation of this Lease within twenty(20) days after written notice by Landlord or Tenant specifying the nature of the default with reasonable particularity.

Abandonment by the Tenant of the property

If the default is of such a nature that it cannot be completely remedied within the twenty-day period and the defaulting party thereafter proceeds with reasonable diligence and in good faith to effect the remedy as soon as practicable, default shall not be declared unless the defaulting party ceases to effect the remedy.

17. TAXES

The Landlord shall pay all real property taxes for real property for the term of this Lease. Tenant shall be liable to pay any taxes, personal or real, incurred as a result of improvements placed upon the leased premises.

18. NONWAIVER

Waiver by either party of strict performance of any provision of this Lease shall not be a waiver of or prejudice the party's right to require strict performance of the same provision in the future or of any other provision of this Lease.

19. ATTORNEY FEES

If suit or action is instituted in connection with any controversy arising out of the Lease, the prevailing party shall be entitled to recover, in addition to costs, such sums as the Court may adjudge reasonable as attorney fees.

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20. SUCCESSION

Subject to the above-stated limitations on transfer of Tenant's interest, this Lease shall be binding upon and inure to the benefit of the parties, their respective successors and assigns.

21. INSPECTION OF PREMISES

The Landlord reserves the right to themselves and their agents to go upon the premises at reasonable and proper times to inspect the same for the purpose of determining that the Lease is being properly observed and that all of the terms of this lease are being performed by the Tenant.

22. IMPROVEMENTS

Any improvements to the real property by Tenant shall remain the property of the Landlord upon termination of this Lease, unless the Tenant obtains the written consent of Landlord to remove said improvements prior to the time the improvements are placed on the property. However, Tenant shall be responsible for refilling the recharge "pond" as set forth in paragraph 10 above.

23. TERMINATION

The Tenant agrees to deliver the property to the Landlord at the end of the term of this Lease and in as good a condition as when accepted, and pursuant to paragraph 10 above.

24. TIME IS OF THE ESSENCE

The parties acknowledge and agree that time is of the essence with respect to all of the terms, conditions, and provisions of this Lease.

25. NOTICES

Any notice required or permitted under this Lease shall be given when actually delivered or when deposited in the United States Mail as certified mail, addressed as follows:

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LANDLORD: HULETTE M. JOHNSON, et., al.
52833 Sunquist Road
Milton-Freewater, Oregon 97862

TENANT: HUDSON BAY DISTRICT IMPROVEMENT COMPANY
P.O. Box 110
Milton-Freewater, Oregon 97862

26. WATER DUES

The annual irrigation water dues as billed to Landlord by Tenant shall be paid by Landlord to Tenant as billed. As part of the rent agreement in paragraph 6 above, Tenant shall pay Landlord an equal amount of said water dues within thirty(30) days of receipt of said water dues from Landlord, during the term of this Lease and any renewals thereof.

27. CAPTIONS AND HEADINGS

The captions and headings throughout this Lease are for convenience and reference only and the words contained therein shall in no way be held or deemed to define, limit, describe, explain or modify the meaning of any provisions of or the scope or intent of this Lease.

28. ENTIRE AGREEMENT

This document is the entire, final, and complete agreement of the parties pertaining to the Lease of the premises described herein, and supersedes and replaces all written and oral agreements theretofore made or existing by and between the parties or their representatives in so far as the premises are concerned.

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IN WITNESS WHEREOF, the parties have executed this Lease on the 15th day of October, 2003.

LANDLORD:

HULETTE M. JOHNSON,

SHIRLEY M. JOHNSON

H. MARC JOHNSON

TENANT:

HUDSON BAY IMPROVEMENT CO.

BY: John C Zerba
it's Secretary/Treasurer

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STATE OF OREGON)
)ss.
County of Umatilla)

On this 15th day of Oct 2003 personally appeared before me the above named HULETTE M. JOHNSON, SHIRLEY M. JOHNSON, and H. MARC JOHNSON and acknowledged the foregoing to be a voluntary act and deed.

OFFICIAL SEAL
KATHLEEN F. YENNEY
NOTARY PUBLIC-OREGON
COMMISSION NO. 337142
MY COMMISSION EXPIRES SEPT. 24, 2004

Kathleen F. Yenney
NOTARY PUBLIC FOR OREGON

My commission expires: 9-24-2004

STATE OF OREGON)
)ss.
County of Umatilla)

On this 15th day of Oct 2003, personally appeared before me the above named John C. Zerba in his capacity as Secretary/Treasurer of HUDSON BAY IMPROVEMENT CO. and acknowledged the foregoing to be a voluntary act.

OFFICIAL SEAL
KATHLEEN F. YENNEY
NOTARY PUBLIC-OREGON
COMMISSION NO. 337142
MY COMMISSION EXPIRES SEPT. 24, 2004

Kathleen F. Yenney
NOTARY PUBLIC FOR OREGON
My Commission expires: 9-24-2004

STATE OF OREGON)
)ss
County of Umatilla)

OFFICIAL SEAL
JACQUELINE A. BUTTS
NOTARY PUBLIC-OREGON
COMMISSION NO. 368700
MY COMMISSION EXPIRES MAY 15, 2007

On this 22 day of October 2003, personally appeared before me the above named H. Marc Johnson, and acknowledged the foregoing to be a voluntary act and deed.

Jacqueline A Butts
NOTARY PUBLIC FOR OREGON

My commission expires May 15, 2007.

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Exhibit "A"

TRACT I:

Township 6 North, Range 35, East of the Willamette Meridian:
Section 33: A tract of land located in the South Half of the Northeast Quarter, and being a portion of that tract of land conveyed to William J. Jackson, by Deed recorded in Book 369, Page 267, Deed Records, and being described as follows, to-wit:

Commencing at the quarter section corner on the line between Sections 33 & 34; running thence North 20 chains: thence West 33-16/100 chains; thence Southeasterly 32-16/100 chains, more or less, to a point on the center line; running East and West through said Section 33, said point being 7 chains West of the point of beginning; thence East 7 chains to the point of beginning. Excepting Therefrom, beginning at the Northeast corner of the Southeast Quarter of the Northeast Quarter of said Section 33: and running thence South 45 rods: then West 35-5/9 rods; thence North 45 rods; thence East 33-5/9 rods to the place of beginning. All being East of the Willamette Meridian, Umatilla County, Oregon. Subject to any and all water rights of way and roads.

TRACT III:

Beginning at the Northeast corner of the Southeast Quarter of the Northeast Quarter of Section 33, Township 6 North, Range 35; running thence South 45 rods; thence West 35 and 5/9 rods; thence North 45 rods; thence East 35 and 5/9 rods to the place of beginning. Excepting therefrom that tract of land conveyed to the State of Oregon, by and through its State Highway Commission by deed recorded in Book 130, Page 573 of the Deed Records of Umatilla County, Oregon. Also, excepting any portion of said premises lying within that strip of land conveyed to Walla Walla and Columbia River Railroad Company, by deed recorded in Book "D", Page 834 of the said Deed Records. All being East of the Willamette Meridian, in the County of Umatilla and State of Oregon;

Excepting any and all water rights of way.

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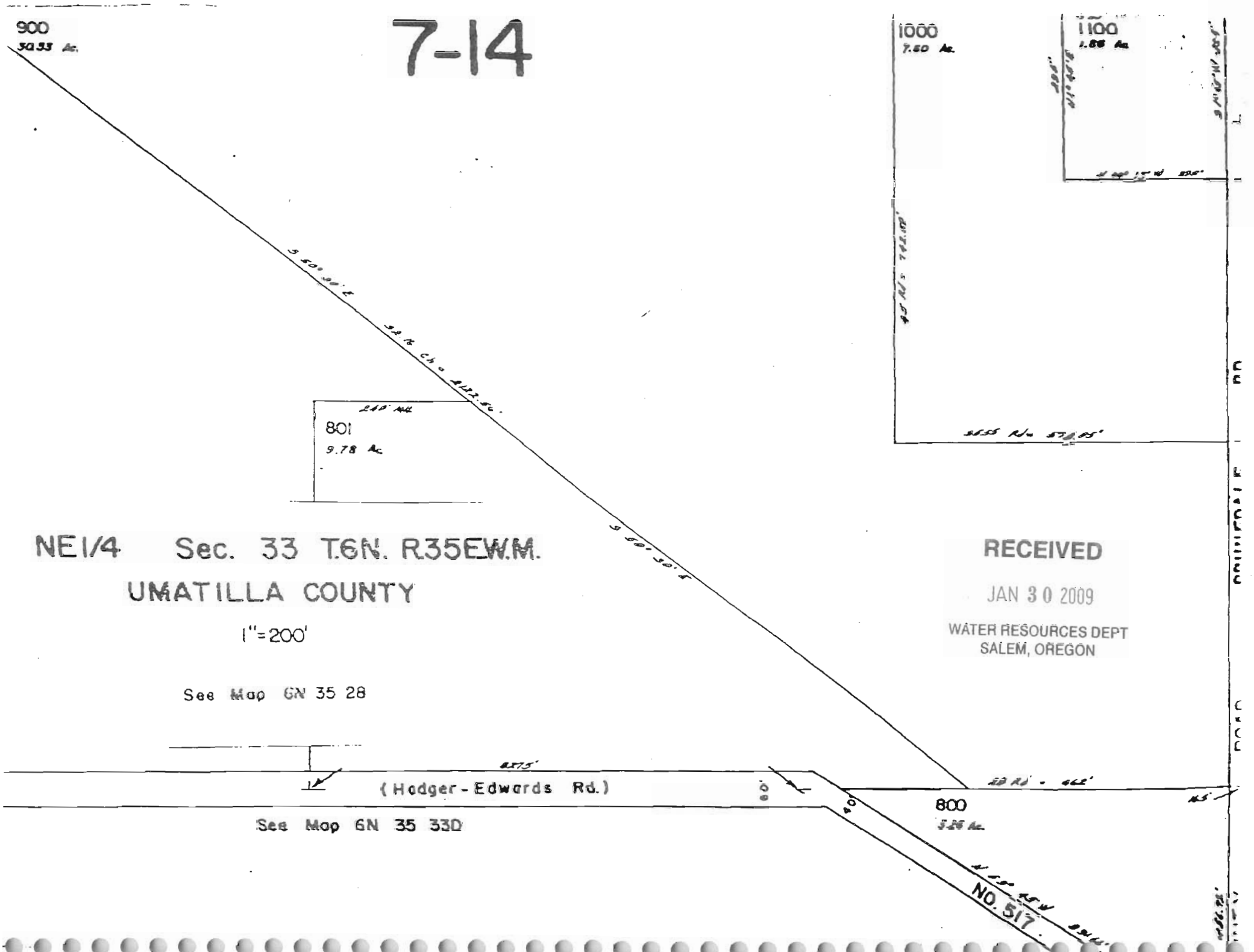
7-14



NE1/4 Sec. 33 T.6N. R.35E.W.M.

UMATILLA COUNTY

1"=200'

See Map 6N 35 28

See Map 6N 35 33D

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Attachment 8B

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License No. _____

STATE OF OREGON

WATER RESOURCES DEPARTMENT

APPLICATION FOR LIMITED WATER USE LICENSE

Applicant(s): Hudson Bay District Irrigation Company

Contact Person: Jon Brough / John Zerba

Mailing Address: P.O. Box 110

Telephone No: 541 938-6105

I (We) make application for a Limited License to use or store the following described surface waters or groundwater-not otherwise exempt, or to use stored water of the State of Oregon for a use of a short-term or fixed duration:

1. **SOURCE(S) OF WATER for the proposed use:** Walla Walla River **a tributary of** Colombia River.

2. **TOTAL AMOUNT OF WATER to be diverted:** 50 **cubic feet per second, or** 50 **gallons per minute. If water is to be used from more than one source, give the quantity from each:** _____.

3. **INTENDED USE(S) OF WATER: (check all that apply)**
   - [ ] **Road construction or maintenance;**
   - [ ] **General construction;**
   - [ ] **Forestland and rangeland management; or**
   - [x] **Other:** Artificial Ground water Recharge.

4. **DESCRIPTION OF PROPOSED PROJECT: Include a description of the intended place of use as shown on the accompanying site map, the method of water diversion, the type of equipment to be used (including pump horsepower, if applicable), length and dimensions of supply ditches and pipelines:** See attached Application document

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5. **PROJECT SCHEDULE: (List day, month, and year)**
Date water use will begin 11.04
Date project will be completed 11.09
Date need for water will be completed 11-09

NOTE: A completed water availability statement from the local watermaster, fees and a site map meeting the requirements of OAR 690-340-030 must accompany this request. The fee for this request is $100 for the first point of diversion plus $10 for each additional point of diversion. The license, if granted, will not be issued or replaced by a new license for a period of more than five consecutive years. The right granted will be subordinate to all other authorized uses that rely upon the same source, or water affected by the source, and may be revoked at any time it is determined the use causes injury to any other water right or minimum perennial streamflow.

REMARKS:

SIGNATURE of Applicant: Jul C Jeal **DATE:** 10-23-08
Title: Son - Mgr

I certify that I have examined the foregoing application and accompanying data, and hereby grant a Limited License to use said water as described in the application, subject to all water rights of record, and subject to any valid public interest concerns which may become evident.

This license shall be in effect beginning _____, 20___, and shall expire _____, 20___.

WITNESS my hand this _____, 20___.

Paul R. Cleary
Water Resources Department
Director

The licensee shall give notice to the Department (Watermaster) at least 15 days in advance of using the water under the Limited License and shall maintain a record of use. The record of use shall include, but need not be limited to, an estimate of the amount of water used, the period of use and the categories of beneficial use to which the water is applied. During the period of the Limited License, the record of use shall be available for review by the Department upon request.

The application was first received at the Water Resources Department at Salem, Oregon, on the _____ day of _____, 20___, at _____ o'clock, ___M.

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2/5/04

To: Department of Environmental Quality
Eastern Region Pendleton Office
700 SE Emigrant, Suite 330
Pendleton, OR 97801

ATTENTION: Phil Richardson, (OWRD File # LL-758)

From: Hudson Bay District Irrigation Company (HBDIC)
P.O. Box 110
Milton-Freewater, Oregon 97862

RE: Request for additional information; Artifical Ground Water Recharge Testing Project (OWRD File # LL-758)

To Whom It May Concern:

The purpose of this letter is to provide the additional information requested by ODEQ for the Artifical Ground Water Testing Project (Attachment 5A: Methodology to Determine Chemical Constituents For Water Quality Assessment and Evaluation and Attachment 5C: Chemicals of Interest for Hudson Bay Recharge Project). The following addresses each of the items requested in the 2/3/4 letter.

- Simazine has been included in Attachment 5C (see attached) along with the chemical properties needed to screen the chemical. If deemed appropriate, the chemical could be added to the final screening list. Also, ODEQ had sampled for this analyte during the 1999 study, and was found not to be a risk. (ODEQ, 1999).
- We concur that the four sampling events (once before, once shortly after, once during and once shortly before the end of the project) would be a more comprehensive way to screen for chemicals during the project. The final chemical list and their cost to process may pose some limitations as to the amount of samples we can collect. After we receive the final list, we can assess costs and notify ODEQ as to our financial constraints of adding a fourth sample.
- Nitrate has been used as a surrogate for solubility in other pesticides studies. However, we concur that unless it was possible to also know how it was applied and which chemicals most resembled its physical properties, that it may have less application for this project. We will still intend however to collect nitrate samples during recharge event(s) as a parameter of general water quality concern.

The additional information requested on the physical properties of the chemicals of concern is provided below.

Objective: In order to assess the **parameters of use** for each of the chemicals of concern (yellowed in Attachment 5C) in the project area. An assessment was conducted to better quantify the definition of "project area" and the types of crops/chemicals used over that area. The additional information requested on the chemicals of interest were:

- Application Method (see below)
- Time of year chemical applied (see below)
- Volume of chemical used per acre (see below)
- Concentration of chemical in application (see below)
- Percentage of project area receiving chemical (see below)
- Recharge site irrigation method (see below)
- Onsite use or offsite use (see below)
- Current or historic use (see Attachment 5C)

Collaborators: Bob Bower (Hydrologist/Artifical Recharge Testing Project Manager), WWBWC and Tom Darnell (Oregon State University Extension Agent).

Project Area: The project area was quantitatively defined to include the recharge testing site and the areas along that the ditch providing the surface recharge water. Total ditch length and land use was determined using a combination of recent aerial photographs (map wheel) and GIS mapping software. In order to calculate total project area, a 20-yard streamside buffer[1] was applied to both sides of the ditch for total area calculations.

- Total Length of Recharge Project area: 3.7 Miles
  - 2 miles in ag area (54% of total length)
  - 1.7 miles (46%) in Milton-Freewater city limits (no buffer value available).
- Total Ag chemical interest area: 14.6 acres
  - Apples: 5 acres
  - Cherries: 1.8 acres
  - Pasture/open ground: 7.7 acres (no chemicals of interest used)
  - Grapes: < 0.1 acre (minute use of chemicals of interest)
- Total of Project area with *potential* to receive chemicals: 47.3 % (city not included).

Specific area and use information:

APPLE ACRES

PRODUCT	SEASON	RATE/ACRE (MATERIAL)	%ACTIVE INGREDENT	AI/ACRE	TOTAL AMOUNT [2] 5 ACRES
Amid-Thin	May	.25 lb	8.4	.021 lb	.105 lb
Rally	April-May	5.0 oz	40.0	2.0 oz	10.0 oz
Rubigan	April-May	12.0 oz	12.0	1.44 oz	7.2 oz
Ridomil[3]	Oct	1.5 fl oz/1000sqft	49.0	32.0 oz	32.0 oz
Procure	April-May	12.0 oz	50.0	6.0 oz	30.0 oz
Intrepid	May	16.0 fl oz	22.6	3.6 oz	18.0 oz
Success	April	8.0 fl oz	22.8	1.8 oz	9.0 oz
Bayleton	April-May	6.0 oz	50.0	3.0 oz	15.0 oz
Provado	May	8.0 oz	17.4	1.4 oz	7.0 oz
Elgetol[4]	April	1.0 gal	N/A	N/A	N/A

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[1] A recent United States District Court decision (Case No. CO1-0132C) stated: "The Court further finds that 20-yard buffer zones for ground use… will substantially contribute to the prevention of jeopardy." (http://agr.wa.gov/PestFert/EnvResources/docs/FinalOrder01-22-04.pdf)

[2] Total amount on five acres is the probable maximum amount of material (active ingredient). Actual use depends on variety, weather conditions and disease pressure. Rally, Rubigan. Procure and Bayleton are fungicides used to control apple scab and/or mildew. Apple orchards do not receive an application of each fungicide each season. The fungicides and insecticides are applied by air blast sprayer.

[3] Ridomil is soil applied, either by hand gun or herbicide sprayer, at the base of the tree. Total amount used is figured on 20 percent of the soil surface treated.

[4] Elgetol use was discontinued in 1986.

CHERRY ACRES

PRODUCT	SEASON	RATE/ACRE (MATERIAL)	%ACTIVE INGREDENT	AI/ACRE	TOTAL AMOUNT[5] 1.8 ACRES
Success	March-April	7.0 fl oz	22.8	1.6 fl oz	2.88 fl oz
Rally	March-April	5.0 oz	40.0	2.0 oz	3.6 oz
Rubigan	March-April	9.0 oz	12.0	1.08 oz	1.9 oz
Procure	March-April	13.0 oz	50.0	6.5 oz	11.7 oz

OTHER PROJECT AREA ACRES

The other project areas were estimated not to have any of the chemicals of interested (yellowed, Attachment 5C). The portion of the ditch passing through the city of Milton-Freewater was not considered for the agricultural chemicals of interest. This portion of the ditch would predominantly be surrounded by lawns and gardens. The types of chemicals used in these areas would include three from our original list: Dacamine (2,4 D), Round Up and Diazinon. These chemicals not typically applied during the recharge project time period and were thus determined to pose little risk. No chemicals were estimated to be used on the pasture/open acreage areas.

Project site irrigation method: Landowner has informed us that sprinkler irrigation has been used at the recharge site.

Project area irrigation method: All of the project Ag areas are in sprinkler irrigation. The small parcel with grapes are on a drip irrigation system.

Onsite use or offsite use: A letter from the landowner described the onsite use in which Simazine was listed. This chemical has been added to the comprehensive list.

Current or historic use: The original Attachment 5A and 5C included an assessment and categorization of chemicals based on historic and current use.

Thank you for your time and attention.

John Brough, HBDIC Director

CC: Don Miller – OWRD
Tim Bailey – ODFW

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[5] Total amount on 1.8 acres is the probable maximum amount of material (active ingredient). Actual use depends on pest populations and pressure and weather conditions. All pesticides are applied on ground by air blast sprayer.

2/5/4

ATTACHMENT 5A: Methodology to Determine Chemical Constituents for Water Quality Assessment and Evaluation

Introduction:

This attachment is intended to specifically help clarify the process by which the proposed list of chemical constituents were determined and to show that a ODEQ water quality permit will not be needed for this limited license groundwater recharge project.

Chemical Constituents Review Methodology

It should be **clearly reiterated** that during construction of the recharge pits/ponds, the top 60 inches (5 feet) of topsoil would be **removed**. This construction criteria assists the project in two ways: (1) it minimizes the chance of site specific chemicals being leached into the ground water during the recharge process, (2) it increases the rate at which recharge water can be applied by exposing the more transmissive substrate below this top soil layer.

Working with our local pesticides expert, (Tom Darnell, OSU Extension Agent in Milton-Freewater) a review was conducted to determine the types of chemicals to consider for during this project's water quality monitoring plan. A description of this review processed is presented below.

Chemical Review Process

1. Using the proposed water diversion time period (Nov 1st through May 15th), a comprehensive list of chemicals[1] was compiled for the project area. This included interviewing the current landowner on the site-specific history of chemical use on that property (see attached signed, written statement).
2. Chemicals were broken down into two classes: **current** chemicals were determined to be those that have been used in the past several years in the project area, and **historical** chemicals are not currently in use, but have were used at some point in the past. This "project area" is defined as the area starting at the Little Walla Walla diversion (on the Walla Walla River) through the lands adjacent to the ditch network to the project site. **Attachment** 5C lists this comprehensive list of chemicals in table form.
3. Reviewed the ODEO Report: *April 1999 Milton-Freewater Groundwater Quality Study: As part of the Statewide Groundwater Monitoring Program* (Richardson, et. al., 2000). ODEQ's well # UMA298 is located proximal to the proposed recharge site which provides excellent preexisting information for this project. **Attached** is a copy of the results and conclusions from that study.
4. Using information from OSU Pesticides database (and several other websites), the complete list of chemicals was further screened based on a set of sequential screening steps. Chemicals were selected for the final monitoring list if they appeared to meet all of the criteria listed below.

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   a. Currently and Historically used chemicals were choosen if:
      i. Soil ½ life = > period when last used, and if
      ii. Pesticide Movement Rating[2] > **or = moderate**, and if
      iii. ODEQ **did not** sample for it in 1999 study (UMA 298 well)

5. Exception to above selection process

   a. ODEQ sampled and found a "positive" detection of **Dathal & Metabolites** as a part of the Phenoxyherbicide screen tests (ODEQ, 1999). The results noted:

   "Dacthal and its metabolites were detected in six samples as part of the Phenoxyherbicide screen. The maximum concentration detected (24.6 micrograms per liter) was much less than the 4,000 micrograms per liter healthy advisory level. Therefore, the concentration of dacthal and metabolites is not believed to represent problems to human health or the environment." (ODEQ, 1999)

---

[1] Chemicals defined to include fungicides, herbicides, miticides, pesticides, and growth regulators.
[2] The Pesticide Movement Rating as reported in OSU report, *(OSU, 1999)*

The plan **is to test** for this group of chemicals during the water quality monitoring portion of this project.

6. The final step in the review process was to evaluate **if** the final list of chemicals were "testable". Two private water quality-testing laboratories (Kuo and Edge Analytical) were contacted and asked if they were able to test for these chemicals in water samples. The results are noted in attachment 5C.

Screening process conclusions:

The final list of chemicals for testing is shown below. Screening and/or testing information for the chemicals Myclobutanil (Systhane, Rally), Triflumizole (Procure), Triadimefon (Bayleton), Imidacloprid (Provado), Methoxyfenozide (Intrepid), and Spinosad (Success) was not available at the time this document was completed. If this information becomes available in the future, and shows evidence that they should not or cannot be screened for, they would be dropped from the final testing list. Chemicals can also be added or deleted from the final list per request by ODEQ review staff.

Proposed List of Chemicals to Monitor for Recharge Project

Fenarimol (Rubigan)
DNOC sodium salt (Elgetol)
Metalxyl (Ridomil)
DCPA, (Dacthal @ Metabolites)
1-Naphthaleneacetamide (Amid-thin)
Myclobutanil (Systhane, Rally)
Triflumizole (Procure)
Triadimefon (Bayleton)
Imidacloprid (Provado)
Methoxyfenozide (Intrepid)
Spinosad (Success)

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Pre-conditions: Using Nitrate as the Indicator

Agricultural fertilizers are the primary source of nitrate in groundwater. Nitrate concentrations greater than 2-3 mg/L in well water indicate that chemicals applied to the land surface are reaching the gorund water system, so detection of pesticides in these wells may be more likely. This relationship between nitrate concentration and pesticide detection may help identify wells at risk for contamination by pesticides. Laboratory analysis for nitrate is simpler and less costly than analysis of pesticides. Consequently, many more Central Columbia Plateau wells have been sampled for nitrate. (See attached report and *Rkyer, S.J. and Jones, J.L., 1995, Nitrate concentrations in ground water of the Central Columbia Plateau: U.S. Geological Survey Open-File Report 95-445, 4 p.)*

After the monitoring wells and recharge facility has been constructed and before operation of the project, a **preconditions water quality test** will be conducted of all chemical constituents (Levels 1 and 2 from Attachment 5 Monitoring Plan). Samples will be collected from the (1) source water entering project site, (2) upgradient on-site observation well, and (3) one of the two down gradient on-site observation wells.

Working in consultation with ODEQ staff, nitrate concentrations collected from this preconditions water quality test will used along with other published information in order to determine a Warning Concentration Level (WCL). This warning concentration level will be used to screen water quality during and after operation of the recharge project. If concentrations exceed this level, operation of the recharge facility will be stopped and a Level II water quality sampling will be done on both surface and groundwater location to determine if chemicals are present. Working with ODEQ, results will be reviewed and any operation changes will implemented to avoid chemical contamination of the groundwater.

Laboratory Resources

Nitrate Analysis: Walla Walla County-City Health Department
310 W. Popular, P. O. Box 1753
Walla Walla, WA 99362
Telephone (509) 527-3290

Chemical Analysis: KUO Testing Labs, INC.
337 south 1st Avenue
Othello, WA 99344
Telephone: (509)-488-0118

Edge Analytical
1151 Knudson
Burlington, WA 98233
(360) 757-1400
(800) 755-9295

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References and additional chemical resources used for the screening process:

Darnell, T., Topielec, R. 1996, October. *Nitrates and Bacteria in Groundwater: A Second Look, Milton-Freewater Area, Umatilla County, Oregon.* Oregon State University Extension Service Water Quality Program.

Darnell, T. Hart, J. Vomocil, Jim. 1989. *Nitrates and Bacteria in Groundwater: Milton-Freewater, Umatilla County Oregon.* Oregon State University Extension Service.

Darnell, T., Montgomery, M. L., Witt, J. M., 1989, July. *Pesticides in Groundwater: Milton-Freewater, Umatilla County, Oregon.* Oregon State University

U.S. Geological Survey 1996, July. *Fact Sheet 171-96: Article: The Nitrate Connection.* US Government Printing Office 774-398/20006 Region NO. 8

Kerle, E.A., Vogue, P. A., Jenkins, J. J., 1996, October. *Understanding pesticide persistence and mobility for groundwater and surface water protection.* Oregon State University Extension EM 86561

Jenkins, J. J., Thomson P. A., 1999, January. *OSU Extension Pesticide Properties Database.* . Oregon State University Extension EM 8709

Cooperative Extension Washington State University. 2002. *2002 Crop Protection Guide for Tree Fruits in Washington.* Washington State University EB0419.

Richerson, P., Cole, D. 2000, June *April 1999 Milton-Freewater Groundwater Quality Study: As part of the Statewide Groundwater Monitoring Program.* State of Oregon Department of Environmental Quality

http://www.cdpr.ca.gov/docs/publicreports/5698.pdf
http://www.fruit.wsu.edu/labels/insecticides.htm#S
http://ace.orst.edu/info/extoxnet/
http://www.pesticideinfo.org/Index.html

Attachment B

ATTACHMENT B: RECORD OF USE (2004-2008)

Recharge Seasons	Period of Operation	Hours of Diversion (actual)	Total Water Use ON HBDIC Recharge Site (acre-feet)	Water Use: Little Walla Walla Diversion to HBDIC Recharge (Conveyance Loss) (acre-feet)
Spring 2004	4/8/4 to 5/14/4	888	409	714
2004-2005	12/1/4 to 2/3/5	672	388	540
2004-2005	3/27/5 to 4/30/5	720	650	579
2005-2006	11/1/5 to 5/15/6	2544	2,813	2,046
2006-2007	11/1/6 to 5/15/7	3072	3,278	2,470
2007-2008	11/14/7 to 3/25/7	2400	1,939	1,930
2007-2008	4/10/8 to 5/15/8	840	820	676
	Total	11,136	10,297	8,955
			Sum of Recharge Project and Conveyance	19,252

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Attachment C

Attachment C: HBDIC Recharge On-Site Operations and Expansions (2004-2008)

Recharge Seasons	Period of Operation	Days of Operation (actual)	Peak Recharge Rate (cfs)	Site Expansion Phase	Infiltration Area (feet^2)	Infiltration Area (acres)	Total Recharge Volume (acre-feet)	Total Recharge Volume (Gallons x 1,000)	Total Rechage (acre-feet (season))
Spring 2004	4/8/4 to 5/14/4	37	8.0	I	15,000	0.3	409	133,273	409 (2004)
2004-2005	12/1/4 to 2/3/5	28	6.8	I	15,000	0.3	388	126,398	1038(2004-5)
2004-2005	3/27/5 to 4/30/5	30	12.1	II	47,420	1.1	650	211,803	
2005-2006	11/1/5 to 5/15/6	106	13.2	II	47,420	1.1	2,813	916,619	2813 (2005-6)
2006-2007	11/1/6 to 5/15/7	128	12.8	II	47,420	1.1	3,278	1,068,140	3278 (2006-7)
2007-2008	11/14/7 to 3/25/7	100	18.4	II	61,987	1.4	1,939	631,962	2759 (2007-8)
2007-2008	4/10/8 to 5/15/8	35	16.8	III	61,987	1.4	820	267,125	
	Total	464					10,297	3,355,320	

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Attachment D

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Oregon Water Resources Department

Final Order
Regarding Limited License Request 758

Requested Water Use

On November 11, 2003 the Water Resources Department received completed LL request 758 from Hudson Bay District Irrigation Company for the use of 50.0 cfs from the Walla Walla River, located in the SW1/4, NE1/4, Section 12, Township 5 North, Range 35 East, W.M., for the purpose of artificial ground water recharge testing, for a period of five years, pursuant to ORS 537.143 and 537.144.

Department Review

The Department, in consultation with Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Environmental Quality (ODEQ), and Confederated Tribes of the Umatilla Indian Reservation (CTUIR), has determined that the requested use may be approved as conditioned and limited below.

The use of water for artificial ground water recharge testing, as requested in limited license application 758, is a use allowed under ORS 537.143.

Sufficient water is available, as required under 690-340-0030(1)(b), for this short-term, fixed duration use. The Director may revoke the right to use water for any reason described in ORS 537.143(2).

The Department provided public notice of the application in the Department's weekly public notice as required by OAR 690-340-0030(2). The Department has received comments related to the issuance of the limited license. The authorization of limited license 758, as conditioned below, will satisfactorily address the issues raised in those comments.

Conditions and Limitations

The use of water from the Walla Walla River shall be limited to 50.0 cfs for the purpose of testing artificial ground water recharge during a testing season of November 1 through May 15. Water may only be diverted when there is adequate flow in the Walla Walla River to honor all existing water rights. When water is diverted under this limited license, the use is further limited to times when there is, at a minimum, the following streamflows in the Tum A Lum reach of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and flowing past

This is a final order in other than contested case. Pursuant to ORS 536.075 and OAR 137-004-080 and OAR 690-01-005 you may either petition the Director for reconsideration of this order or petition for judicial review of this order. As provided in ORS 536.075, this order is subject to judicial review under ORS 183.484. Any petition for judicial review of the order must be filed within the 60 day time period specified by ORS 183.484(2).

Nursery Bridge Dam: November - 64 cfs, December and January - 95 cfs, February to May 15 - 150 cfs. Nursery Bridge Dam is located just downstream of Nursery Bridge and is downstream of the Little Walla Walla diversion. The District 5 Watermaster, based on gage and/or streamflow measurements, shall make the determination that the above described streamflows are flowing past Nursery Bridge Dam. Diversion under this limited license shall cease when said streamflows are not being met.

Based on a review of water quality information generated during the term of this limited license or from other sources, ODEQ can require the licensee to terminate the diversion of water into the recharge area. If monitoring data or other information results in identification of potential water quality concerns ODEQ may require modifications to the existing limited license and/or require a permit to address the water quality concerns prior to reinitiating artificial ground water recharge.

The licensee shall install, maintain and operate fish screening and by-pass devices as required by the Oregon Department of Fish and Wildlife to prevent fish from entering the proposed diversion. See copy of enclosed fish screening criterial for information.

The use of water under a limited license shall not have priority over any water right exercised according to a permit or certificate, and shall be subordinate to all other authorized uses that rely upon the same source. The Director may be prompted by field regulatory activities or by any other reason to revoke the right to use water (ORS 537.143 (2) and OAR 690-340-0030 (6)).

The licensee shall give notice to the Watermaster at least 15 days, but no more than 60 days, in advance of using water. The notice shall include the location of the diversion, place of recharge, the quantity of water to be diverted and the intended use.

ORS 537.143(8) provides that a limited license cannot be issued for the same use for more than five consecutive years. This limited license provides for the maximum allowable time.

The licensee shall meter all water use and maintain a record of use, including the total number of hours of diversion and an estimate of the total quantity diverted. During the period of the limited license, the record of use shall be available for review by the Department upon request and shall be submitted to the Watermaster upon request.

Upon project completion, the licensee shall submit the record of use to the Water Resources Department.

The licensee shall conduct artificial ground water recharge testing in a manner consistent with the license application proposal. This includes monitoring the amount of water diverted from the Walla Walla River and the amount delivered to the recharge pits from the ditch.

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Order

Therefore, pursuant to ORS 537.143 and ORS 537.144, limited license 758 is issued as conditioned and limited above.

Issued February 18, 2004

Paul R. Cleary, Director
Water Resources Department

Enclosures - limited license and fish screen criteria

cc: Tony Justus, Watermaster, District 5
Tim Bailey, ODFW
Phil Richerson, ODEQ
Rick George, CTUIR

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If you need further assistance, please contact the Water Rights Section at the address, phone number, or fax number below. When contacting the Department, be sure to reference your limited license number for better service.

Remember, the use of water under the terms of this limited license is not a secure source of water. Water use can be revoked at any time. Such revocation may be prompted by field regulatory activities or by any other reason.

Water Rights Section
Oregon Water Resources Department
158 12th ST NE
SALEM, OR 97310

Phone: (503)378-8455
Fax: (503)378-6203

FISH SCREENING CRITERIA FOR WATER DIVERSIONS

This summary describes ODFW fish screening criteria for all fish species.

Screen material openings for ditch (gravity) and pump screens must provide a minimum of 27% open area:

> **Perforated plate**: Openings shall not exceed 3/32 or 0.0938 inches (2.38 mm).
> **Mesh/Woven wire screen**: Square openings shall not exceed 3/32 or 0.0938 inches (2.38 mm) in the narrow direction, e.g., 3/32 inch x 3/32 inch open mesh.
> **Profile bar screen/Wedge wire**: Openings shall not exceed 0.0689 inches (1.75 mm) in the narrow direction.

Screen area must be large enough not to cause fish impact. Wetted screen area depends on the water flow rate and the approach velocity.

> **Approach velocity**: The water velocity perpendicular to and approximately three inches in front of the screen face.
> **Sweeping velocity**: The water velocity parallel to the screen face.
> **Bypass system**: Any pipe, flume, open channel or other means of conveyance that transports fish back to the body of water from which the fish were diverted.
> **Active pump screen**: Self cleaning screen that has a proven cleaning system.
> **Passive pump screen**: Screen that has no cleaning system other than periodic manual cleaning.

Screen approach velocity for ditch and active pump screens shall not exceed 0.4 fps (feet per second) or 0.12 mps (meters per second). The wetted screen area in square feet is calculated by dividing the maximum water flow rate in cubic feet per second (1 cfs = 449 gpm) by 0.4 fps.

Screen sweeping velocity for ditch screens shall exceed the approach velocity. Screens greater than 4 feet in length must be angled at 45 degrees or less relative to flow. An adequate bypass system must be provided for ditch screens to safely and rapidly collect and transport fish back to the stream.

Screen approach velocity for passive pump screens shall not exceed 0.2 fps or 0.06 mps. The wetted screen area in square feet is calculated by dividing the maximum water flow rate by 0.2 fps. Pump rate should be less than 1 cfs.

For further information please contact:

Bernie Kepshire
Oregon Department of Fish and Wildlife
7118 NE Vandenberg Avenue
Corvallis, OR 97330-9446
(541)757-4186 x255
bernard.m.kepshire@state.or.us

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Attachment E

This page to be completed by the local Watermaster.

WATER AVAILABILITY STATEMENT

Name of Applicant: Hudson Bay District Irrigation Co. Application Number: _____

1. To your knowledge, has the stream or basin that is the source for this application ever been regulated for prior rights?

   ☑ Yes ☐ No

   If yes, please explain:

   The Walla Walla River is typically short of water to serve all rights in July, August, September and October.

2. Has the stream or basin that is the source for this application ever been regulated for minimum stream flows?

   ☐ Yes ☑ No

   If yes, please explain:

3. Do you observe this stream system during regular fieldwork?

   ☑ Yes ☐ No

   If yes, what are your observations for the stream?

   Typically there is extra water from November to June.

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4. Based on your observations, would there be water available in the quantity and at the times needed to supply the development proposed by this application?

   ☑ Yes ☐ No

   What would you recommend for conditions on a permit that may be issued approving this application?

   Limit diversion similarly to Hudson Bays permit #53662. Allow diversion when flows are in excess of 64cfs in November, 95cfs in December and January, and 132 cfs in February to May 15 each year.

5. Any other recommendations you would like to make?

Signature Tony Justus WM District #: 5 Date: 10/31/03

Oregon Water Resources Department

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cc: Tony Justus, Watermaster, District 5
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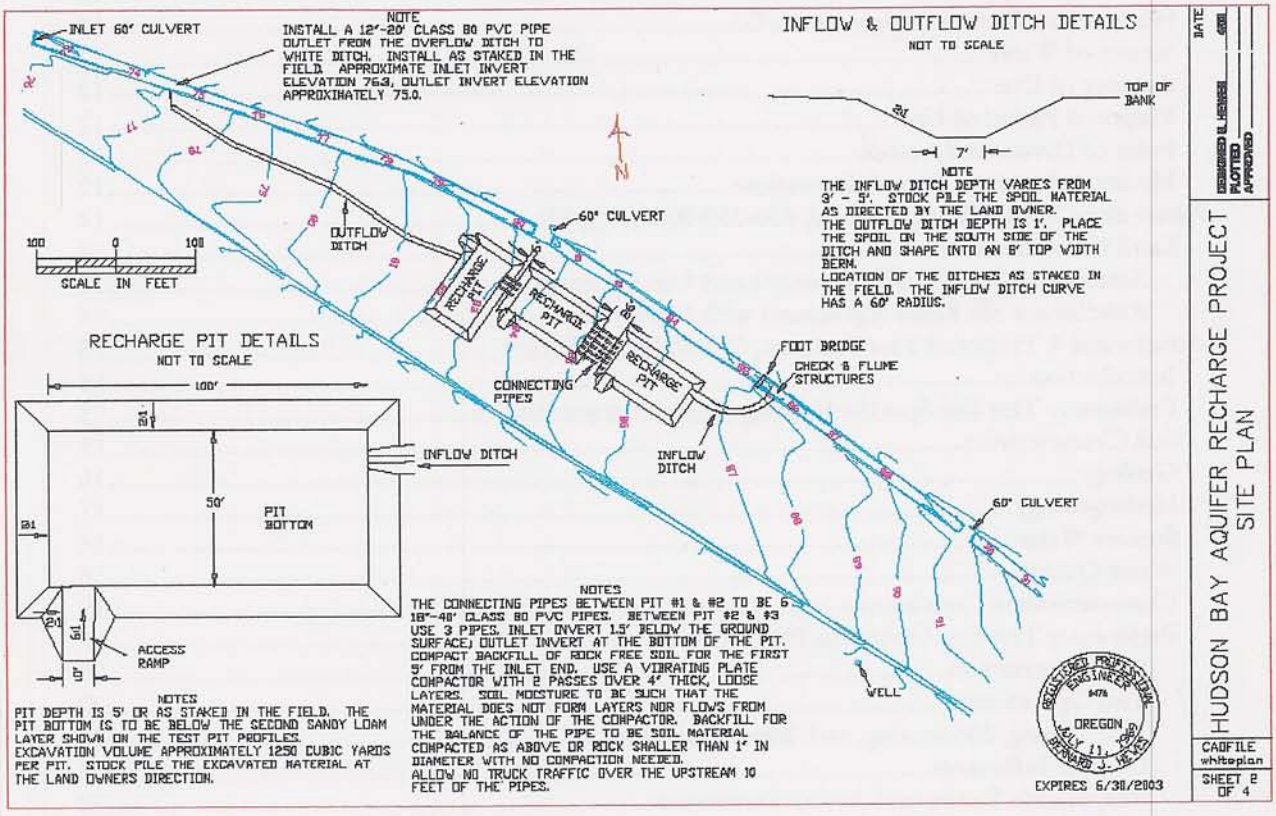
For further information please contact:

Bernie Kepshire
Oregon Department of Fish and Wildlife
7118 NE Vandenberg Avenue
Corvallis, OR 97330-9446
(541)757-4186 x255
bernard.m.kepshire@state.or.us

Hudson Bay Aquifer Recharge Project

An application for ASR Testing Limited License to Oregon Water Resources Department (OWRD) (OAR 690-350-0020)



Prepared for the HBDIC by:

Walla Walla Basin Watershed Council
Kennedy and Jenks Consultants, Inc.

October 20, 2003

Table of Contents

Table of Contents 2
Introduction 4
Overview of Watershed Conditions 4
Figure 1 Scaled Map of Project and Surrounding Area 7
Figure 2 WWBW Monitoring and Recharge Site Map 8
Attachment 1. Project Layout, 690-350-0020(3)(a)(E) and (I) and 690-350-0020(3)(b)(B) 10
Engineering Attachments: 11
Attachment 1A: Location Map 11
Attachment 1B: Site Plan 11
Attachment 1C: Structure Details 11
Attachment 1D: Structure Reinforcing Steel 11
Attachment 1E: Signed and Stamped Copy of *Project Engineering Report* 11
Attachment 2. Water Rights Statement, 690-350-0020(3)(a)(F) and (G) 12
Water Right Applicant: 12
Hudson Bay District Improvement Co 12
Source of Water: 12
Purpose of Use: 12
Proposed Period of Use: 12
Point of Diversion Location: 12
Minimum Instream Flow Information: 12
Attachment 3. Land Use Approval, 690-350-0020(3)(a)(H) 14
Land Use Attachments 14
Attachment 3A: Umatilla County Land Use Approval 14
Attachment 3B: Lease Agreement with Landowner 14
Attachment 4. Proposed Test Program, 690-350-0020(3)(b)(A) 15
Introduction 15
Preliminary Test Site-Specific Hydrogeologic Characterization 15
Soil Characteristics 15
Geology 16
Hydrogeology 17
Surface Water 18
Water Quality 18
Characterization Conclusions 19
Preliminary Test Site Operation Plan 19
Site Construction 20
Test Operations 20
Test Timing, Monitoring, and Water Quantities 20
Outside Influences 21
Responsible Parties and Access Permission 22
Mitigation 22
Reporting 22
Attachment 5. Proposed Monitoring Program, 690-350-0020(3)(b)(A) 23
Overview of Basin Wide Monitoring Plan 23
Recharge Project Monitoring Plan 23
Sampling and Analysis Program 24
(1) Source Water at Test Site 24
(2) Site Groundwater 25
(3) Distal Groundwater 25
(4) Surface Water (Springs) 26
Sampling Parameters 26

Sampling Procedure 27
Equipment 27
Water Level 27
Decontamination 28
Purging and Field Parameters (On site wells only) 28
Water Sampling 28
Resampling 29
Chain of Custody and Sample Handling 29
Field Records and Data Validation 29
Data Reporting and Statistical Analysis 30
Record Keeping 30
Evaluation 30
Data evaluation will include: 30
Annual Review and Reporting 30
Final Recharge Test Project Report 31
Monitoring Plan Attachments 31
Attachment 5A. Methodology Water Quality Assessment and Evaluation 31
Attachment 5B. Figure 5A Map of On-site Recharge Well Locations 31
Attachment 5C Chemicals of interest for Hudson Bay Recharge Project 31
Attachment 6. Site Hydrogeology, 690-350-0020(3)(b)(C), (E), and (G) (attached) 32
Attachment 7. Source Water Quality, 690-350-0020(3)(b)(D) 32
Overview 32
Attachment 7A Source Water Quality Information 32
Resources and References: 33
ATTACHMENTS 34

Attachment 5D History of chemical use: Recharge Site Specific

Attachment 8A Water Availability (Water Master)

8B Application form - OWRD

Introduction

The Walla Walla Basin Watershed Council (WWBWC), in cooperation with the Hudson Bay District Improvement Company (HBDIC), has proposed to test shallow aquifer recharge at a site located adjacent to the HBDIC's *White Ditch* in section 33, T6N, R35E. At the test site a series of three infiltration pits will be built. Water will be supplied to these pits via a diversion from the canal. Recharge activities are proposed during the winter and spring months, when the Walla Walla River (the source of water for the canal) is running at higher flows. The proposed shallow aquifer recharge testing would be done under an ASR Testing Limited License granted by Oregon Water Resources Department (OWRD) (OAR 690-350-0020). By recharging shallow groundwater it is hoped that a portion of the recharge water will return to restore diminished spring-creek and Walla Walla River baseflows. Testing will not include removal of stored water by pumping or other artificial means.

The Limited License Application requires several supporting documents be attached (690-350-0020 (3)(b)), including (but not limited to) those describing proposed testing, groundwater conditions (including hydrogeologic conditions and groundwater quality), and source water quality. Information not included in this assessment report, but still needed for the application, will be collected during proposed site-specific hydrogeologic characterization, monitoring, and testing process. This limited license application is to gain approval of the proposed shallow aquifer recharge testing. The complete list of Attachments as called for in include:

Attachment 1. Project Layout and Size, 690-350-0020(3)(a)(E) and (I) and 690-350-0020(3)(b)(B)
Attachment 2. Water Rights Statement, 690-350-0020(3)(a)(F) and (G)
Attachment 3. Land Use Approval, 690-350-0020(3)(a)(H)
Attachment 4. Proposed Test Program, 690-350-0020(3)(b)(A)
Attachment 5. Proposed Monitoring Program, 690-350-0020(3)(b)(A)
Attachment 6. Site Hydrogeology, 690-350-0020(3)(b)(C), (E), and (G)
Attachment 7. Source Water Quality, 690-350-0020(3)(b)(D)

Overview of Watershed Conditions

The quantity, storage, timing, and availability of water are several major challenges facing watershed managers in the Walla Walla River Basin. The relationship between the Walla Walla River and its distributaries with that of the shallow alluvium aquifer has been shown to be highly interdependent (Piper, 1933, Newcomb, 1965, Barker & McNish, 1975, Bower et. al., 2001). The Walla Walla Basin Watershed Council, Walla Walla Watershed Alliance, and Hudson Bay District Improvement Company (HBDIC), working with their partners in OWRD, ODEQ and ODFW, propose to explore the utility of artificially recharging the shallow alluvial aquifer as a way to help offset the loss of natural recharge opportunities throughout the basin.

Surface water and shallow groundwater in the Walla Walla Basin (the Basin) form an interconnected system. In some areas, especially upstream areas where streams leave the mountains and highlands surrounding the Basin to flow out onto the Basin floor, streams historically probably branched out onto the Basin floor and some of the water they carried seeped into the ground, recharging the shallow groundwater system. This shallow groundwater, recharged near the edge of the Basin, formed the main source of clean, cool groundwater found further down basin where it returned to the surface via springs and base flow to the Walla Walla River. Through the years, the issuance of hundreds of surface and groundwater rights has resulted in the allocation of nearly all of the naturally available water in the basin. These allocations have pressured water resources, compelling the

Washington State Department of Ecology to close ground waters to further appropriations due to concerns about dropping water table levels. Other indicators of overstressed water resources include: (1) dry or dropping well levels, some wells in OWRD's inventory of state-observation-wells, (2) dry or dropping flow volumes in the spring branches, and (3) loss of natural and artificial groundwater recharge opportunities through irrigation efficiency and improved surface water management.

The state of Oregon has recognized use of artificial recharge as a tool "that can be an effective and efficient method for storing water for futures uses."(OWRD, Umatilla Basin Report, 1988). Artificial recharge has been shown to work in other areas of Umatilla County such as the County Line Water Improvement District Project, in operation since 1977. An OWRD review of this project states "It has been instrumental in arresting and reversing ground water level declines in a portion of the Ordnance Critical Ground Water Area." (OWRD, 1988). The USGS also noted the need for artificial recharge in the Walla Walla valley to offset increased water demands and loss of natural and artificial recharge mechanisms: "(Irrigation efficiency measures) can diminish the infiltration to recharge the ground water," wrote Newcomb in his important 1965 report. "Consequently, any such plans for changes in river regimen could well be required to provide for compensatory recharge or to sustain counter charges for their diminution of natural recharge and storage.

This project will comprise of three major components: Construction-Operation, Monitoring-Evaluation and Outreach-Education.

Construction-Operation: After receiving the appropriate permits and/or approval from OWRD, OWDF, ODEQ, USFWS, NOAA Fisheries and the Umatilla County Planning Department, a series of three pits specifically designed for passive artificial recharge will be constructed on land provided by the Hudson District Improvement Company (HBDIC). The land is being leased from one of the district's patrons by the HBDIC and a written agreement for the lease has been secured. The pits will be constructed in such a way to maximize recharge rates while minimizing the ground water quality impacts during the winter/spring recharge period. Project features include a concrete check structure in adjacent White Ditch, a concrete flow-measuring flume, an open connection ditch, three excavated pits, pipes connecting the pits and an outflow ditch from the down stream pit. These pits are designed to handle 50 cubic feet per second (cfs) of water anticipated to be available during the winter/spring Walla Walla River runoff. The actual volume of winter-spring water delivered will depend on the above-mentioned permitting and review process and the actual field verified constraints once in operation. Operation of this structure will be based on the instructions provided by OWRD in the operation permit and agreed to by the various project partners and agencies.

Monitoring-Evaluation: Monitoring of project will be conducted at several levels including: (1) on-site subsurface hydrologic and hydrogeologic monitoring, (2) off-site subsurface hydrologic and hydrogeologic monitoring, (3) off-site surface monitoring of springs through flow and photo-point measurements, (4) on/off-site water quality monitoring of key physical and chemical properties. The results of this intensive monitoring will be evaluated to identify impacts of the proposed project on groundwater levels and flow beneath and around the site, on surface water and spring discharges down gradient of the site, and on base flow to the Walla Walla River. Monitoring will also identify potential problems associated with the project

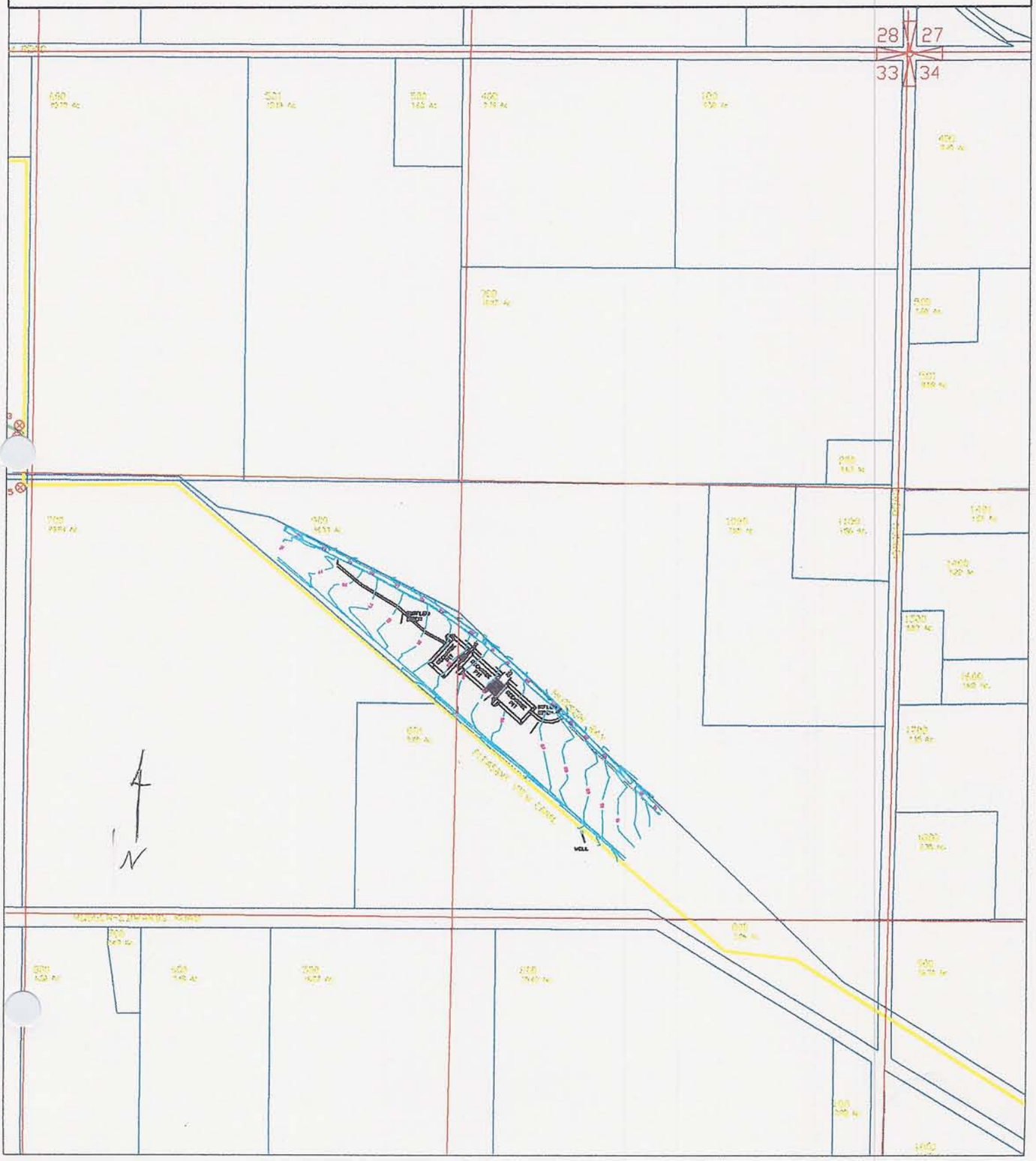
Outreach-Education: This project will also serve as an important outreach and education tool for the general public and water users of the Walla Walla valley. Particular focus and time will be spent on utilizing the site and the results for the recharge analysis to educate people on the role that ground water plays in the rivers and streams of the Walla Walla Watershed.

This project meets all of the habitat restoration actions from the *Oregon Aquatic Habitat Restoration and Enhancement Guide* including:

1. Change the trend of aquatic habitat function from one of a diminishing ability to support salmonids and other organisms to one that supports a complex, self-sustaining system. Such systems provide high quality habitat and ecological capacity for salmonids and other species; or
2. Correct or improve conditions caused by past management and/or disturbance events; or
3. Maximize beneficial habitat in the short term where watershed degradation has been extensive and natural processes will need substantial time to restore habitat; or
4. Create beneficial habitat and restore stream function to the fullest extent possible within developed areas where no reasonable expectation of returning to natural conditions exists.

HUDSON BAY AQUIFER RECHARGE PROJECT
LOCATED IN THE NE$\frac{1}{4}$ OF SEC33, T6 N, R35E W.M.

Figure 1 Scaled Map of Project and Surrounding Area



0 400 800

SCALE IN FEET

ONE INCH EQUALS 400FT

NOTE:
THE PURPOSE OF THIS MAP IS TO IDENTIFY THE APPROXIMATE LOCATION OFTHE PROJECT. IT IS NOT INTENDED TO PROVIDE INFORMATION RELATIVE TO THE EXACT LOCATION OF PROPERTY OWNERSHIP BOUNDERY LINES OR ANY OTHER SIGNIFICANT MAP SUBJECTS

LEGEND

POWELL PV CANAL

TAX LOT BOUNDERY LINES

QUARTER QUARTER LINES

28 27
33 34

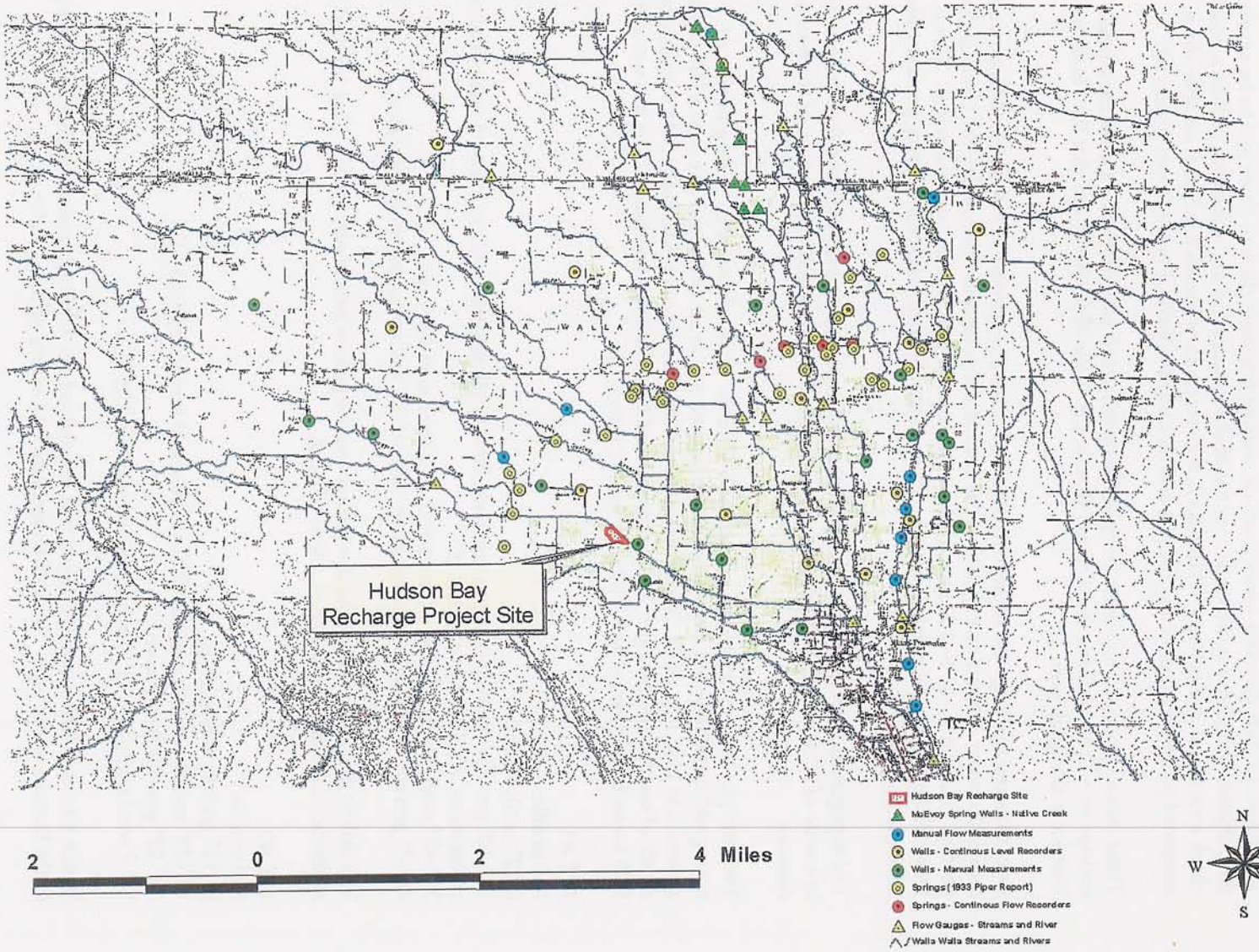
SECTION CORNER

HUDSON BAY AQUIFER RECHARGE PROJECT LOCATED IN THE NE1/4 OF SEC33, T6 N, R35E W.M.

FIGURE 1A

Figure 2 WWBW Monitoring and Recharge Site Map

FIGURE 2. WWBWC Monitoring Network and Hudson Bay Recharge Project 2003



Attachment 1. Project Layout, 690-350-0020(3)(a)(E) and (I) and 690-350-0020(3)(b)(B)

Prepared by Bernard Hewes, Licensed Engineer in the State of Oregon.

This project entails diverting water from an existing irrigation ditch to three pits to be excavated for the purpose of infiltrating the water into the shallow aquifer. Project features include a concrete check structure in the existing White Ditch, a concrete flow measuring flume, an open ditch, three excavated pits, pipes connecting the pits and an outflow ditch from the down stream pit.

These items were sized to handle 50 cubic feet per second (cfs) of water. This is the amount anticipated will be available from excess flow in the Walla Walla River and that the Hudson Bay District is able to deliver.

Data gathered to design the project consisted of a site topographic survey and installing two sites for testing the water infiltration capacity of the natural materials and determining the layers in the soil profile. In addition the Soil Survey of Umatilla County Area, Oregon was consulted. This is a US Dept. of Agriculture, Natural Resources Conservation Service publication giving general soils information.

The topographic survey data was used to prepare a topographic map with one foot contour intervals at a scale of 1" = 60'. This information was used to help determine the location of the project features.

Two test pits were excavated to a depth of 6'-7' each. A 24" diameter by 5' long section of corrugated metal pipe was set on end in the bottom of the pit and about one foot of fill placed around it to hold it in place. Water was pumped into the pipe at a rate that would sustain a water depth of one foot in the pipe. Both flow rate and total flow was measured. The test was run for 6.25 hours in the first pit and 3.5 hours for the second pit.

PIT #1
Soil profile:
0-12" sandy loam
12"-36" gravelly sandy loam, approximately 50% of the material volume is gravel size particles with an estimated D 50 size of about 0.75"
36"-48" sandy loam, in parts of the trench this layer does not exist
48"-?" gravelly sandy loam approximately 20% of the volume is gravel size particles

The inflow rate at the end of the test period was 4.0 gallons per minute (gpm). This resulted in an infiltration rate of 1.7 gpm/sq. ft./ foot of head.

PIT #2
Soil profile:
0"-13" gravelly sandy loam
13"-39" cobbly sandy loam, the D50 of the gravel is approximately 1"
39"-52" gravelly sandy loam
52"-? sand gravel mix D 50 estimated to be about 0.25"

In this pit the inflow rate of 11.9 gpm was maintained for 3.5 hours and at no time did water puddle in the bottom of the pipe. The infiltration rate is in excess of 3.8 gpm/sq. ft.

The area needed for infiltrating the water was determined assuming an infiltration rate for the entire area of 3.0 gpm/sq.ft./ per foot of head. For an inflow rate of 50 cfs the infiltration area needs to be

7480 square feet. The infiltration rate of 3.0 gpm/sq.ft. was chosen because the pits will be located in the area with soil surface texture similar to test pit #2.

Due to the possibility of fine soil particles plugging the infiltration area, unknowns concerning the long-term infiltration rate and that the amount of water available is not yet known extra infiltration area is being provided. Three separate pits with bottom dimensions of 50 feet X 100 feet are proposed. This will provide an infiltration area of 15,000 square feet.

The pits will be excavated to a depth of about 5 feet to get below the second sandy loam layer noted in both test pits. This will allow the water depth to be 2.5 feet - 3.5 feet. That will increase the rate of infiltration over the test values derived with one foot of water depth. The overall safety factor for the infiltration area is well over 2.

Inflow to the system will be measured with a ramp flume and continuously recorded. The ramp flume is sized to provide 5% flow rate accuracy over a flow range of 10 cfs-50 cfs

Any outflow from the last pit will be safely returned to the White Ditch through a 12-inch pipe. The pipe will be on a slope that will keep water from flowing out of White Ditch.

Engineering Attachments:

Attachment 1A: Location Map
Attachment 1B: Site Plan
Attachment 1C: Structure Details
Attachment 1D: Structure Reinforcing Steel
Attachment 1E: Signed and Stamped Copy of *Project Engineering Report*

Attachment 2. Water Rights Statement, 690-350-0020(3)(a)(F) and (G)

Water Right Applicant:

Hudson Bay District Improvement Co.

P.O. Box 110
Milton-Freewater, Oregon 97862
Project Contact: John Zerba, WBDIC Board Member
Telephone: (541)-938-6100
Operations Contact: Jon Brough, WBDIC District Manager
Telephone: (541)-520-2856
Recharge Project Manager (WWBWC), Bob Bower, Hydrologist
Telephone: (541)-938-2170

Source of Water:

Walla Walla River, a tributary of the Colombia River, within the Umatilla River Basin.

Purpose of Use:

Artificial Groundwater Recharge using water diverted during the fall, winter, and spring freshet flows on the Walla Walla River and utilizing the HBDIC recharge structure near Milton-Freewater, Oregon.

Proposed Period of Use:

November 1 through May 15 and as Further limited below

Point of Diversion Location:

~~NE ¼ NW ¼, Section 1, SW ¼ NE ¼~~ Section 12, T5N, R35E, W.M.; ~~DIV.PT. 1 910 Feet South and 700 Feet West from North ¼ Corner Section 1~~; DIV. PT. 2 – 1030 Feet North and 900 Feet East From the Center ¼ Corner Section 12.

Minimum Instream Flow Information:

When water is diverted under this permit, the use is further limited to times when there is, at a minimum, the following streamflows in the Tum-a-lum branch (mainstem) of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and flowing past Nursery Bridge Dam.

Utilizing the Minimum Perennial Streamflows information (table 1, page 31) in OWRD Umatilla Basin Report (OWRD, 1988) and HBDIC's current winter water diversion permit (Permit Number 53662) the following represent the minimum instream flows at Nursery Bridge Dam:

- November – 64 cfs
- December through January – 95 cfs
- February through May 15 – 132 cfs

Nursery Bridge is located just downstream of Nursery Bridge and is downstream of the Little Walla Walla Diversion, the East Side Canal and the District's Canal, also described as point of diversion 1 in this application.

In order for diversion to occur under this permit, the above described streamflows must be met in the Tum-a-lum branch of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and following past Nursery Bridge Dam (see OWRD permit (Permit Number 53662 for operating and maintenance requirements for this station). Said streamflows shall be measured at the gauging station described below. In the event the primary gage experiences mechanical difficulties, stream flows at Nursery Bridge Dam shall be calculated by subtracting from the streamflows at Little Walla Walla Diversion (Cemetery Bridge) from those streamflows recorded at either the WWBWC gauge at Grove School Bridge or a combination of streamflows at OWRD's North and South Fork stations (#s).

Attachment 3. Land Use Approval, 690-350-0020(3)(a)(H)

The HBDIC recharge project staff has consulted with both the Umatilla County Planning department and the current landowner (Hulette Johnson). Attached you will find two documents addressing the anticipated land use and zoning issues needed for construction and operation of this project. The first (Attachment 3A) a Land Use Form approved by the Umatilla County Planning Department. This was originally submitted as a requirement in the funding request to the Oregon Watershed Enhancement Board. The second Attachment (Attachment 3B) was is a lease agreement between the HBDIC and the current landowner and water right holder, Hulette Johnson.

Land Use Attachments

Attachment 3A: Umatilla County Land Use Approval
Attachment 3B: Lease Agreement with Landowner

Attachment 4. Proposed Test Program, 690-350-0020(3)(b)(A)

Introduction

The Walla Walla Basin Watershed Council (WWBWC), in cooperation with the Hudson Bay Improvement District (HBID), has proposed to test shallow aquifer recharge at a site located adjacent to the Hudson Bay Canal in section 33, T6N, R35E. At the test site a series of three infiltration pits will be built. Water will be supplied to these pits via a diversion from the canal. Recharge activities are proposed for winter and spring months when the Walla Walla River (the source of water for the canal) is at peak annual flows. The proposed shallow aquifer recharge testing will be done under an ASR Testing Limited License granted by Oregon Water Resources Department (OWRD) (OAR 690-350-0020).

Preliminary Test Site-Specific Hydrogeologic Characterization

Site-specific hydrogeologic characterization is designed to identify and define local conditions to provide a technical basis for designing the monitoring which will be used to evaluate testing. For this project a number of characterization needs are outlined in the 3 July 2003 hydrogeologic assessment letter report (Attachment 6). These needs include determining the physical properties of the geologic units underlying the test site, investigating the presence of a possible semi-confined aquifer in the upper part of the suprabasalt aquifer system, identifying aquifer hydraulic properties, and establishing suprabasalt aquifer baseline conditions, including seasonal variation, for groundwater depth, flow direction, and quality. These, and other site characterization issues, will be addressed using test site-specific hydrogeologic characterization data collected predominantly using:

1. Test pits, boreholes, and wells constructed for the direct observation of ` subsurface conditions
2. Infiltration tests (constant and falling head) designed to evaluate spatial variability at a site both laterally and vertically (note, the water source for this activity may require a temporary permit)
3. Aquifer testing and water level measurements to evaluate baseline aquifer physical conditions before testing
4. Surface and ground water quality data collected to evaluate the affect (if any) of test site operation on area groundwater quality
5. Well and canal records describing water use in the project area
6. Water flow metering at the test site that indicates surface water in-flow and out-flow during testing

At this time, geophysical investigations are not being considered because of the lack of subsurface control and ground truth data that could be used to constrain geophysical interpretations. The following sections describe proposed soils, geologic, hydrogeologic, surface water, and water quality characterization for this project.

Soil Characteristics

The HBDIC recharge project will be constructed by excavating the top 5 feet (72 inches) of soil from each of the recharge pits (See Engineering Design Report, ATTACHMENT 1). Test Pits constructed and evaluated in the Engineering Design Report provide site-specific soil profile information. Additionally, the "Soil Survey of Umatilla County Area, Oregon, (USDA, 1988) provides some general information about soil in the upper 60 inches at the project site. The two soils

present at the site are: Freewater (29A) and Cowsly (22C). As the entire soil layer will be removed during construction, it was not found useful to further characterize the specific soil properties further.

Geology

Geologic features control the physical characteristics of aquifer hosting materials, and therefore the distribution and movement of groundwater through an aquifer. Understanding the nature and occurrence of these features, both regionally and locally, provide constraints on testing, data interpretation, monitoring, mitigation, and final design. The objective of geologic characterization is to develop a three dimensional physical framework that describes the materials hosting the vadose zone and groundwater at the test site. Within this framework, or conceptual model, the nature and distribution of those factors thought to control groundwater movement and distribution will be evaluated.

Site-specific geologic characterization will be accomplished largely through the analysis of data collected during the drilling of several proposed boreholes at the site and comparison of that data to information collected during the preparation of the hydrogeologic assessment report. A minimum of three boreholes are proposed for the immediate vicinity of the test site. One of these boreholes will be located on the inferred up-gradient side of the test site, two will be located on the inferred down-gradient side (Attachment 5C). As testing progresses, additional boreholes may be drilled to collect additional characterization, testing, and/or monitoring data. Subsurface hydrogeologic conditions will be interpreted via drilling cuttings and spilt-spoon sample logging.

The project hydrogeologic assessment identified work needed to complete site-specific hydrogeologic characterization. Hydrogeologic characterization targets, and the rational for them, are described below.

It is likely that the uppermost, unconfined part of the shallow aquifer system, is hosted by predominantly uncemented alluvial gravel beneath the test site. However, it is not clear from the available data how deep the alluvial gravels extend and what their properties are beneath the test site. Identifying the three-dimensional extent of these strata is critical to the proposed testing because water probably will move more rapidly through these uncemented strata, both downwards and laterally, then in the deeper, more cemented Mio-Pliocene conglomerate that comprises the majority of the shallow aquifer system in the area.

Area data indicates that, if present, the unconfined part of the shallow aquifer system at the site may be relatively thin and underlain by a semi-confined zone at depths of less than 75 feet. Characterization will identify if this semi-confined zone is actually present, and if found, the nature of the confining layer separating it from the overlying unconfined zone and the basic hydrologic properties of the semi-confined zone. Knowing the nature and extent of the confined aquifer underlying the site is critical in evaluating if the proposed recharge will affect this deeper aquifer. If data collected indicates that the project could potentially affect this deeper aquifer, monitoring will need to be designed to not only assess shallower unconfined aquifer impacts but deeper confined aquifer impacts as well.

The nature and distribution of the confining layer atop the confined aquifer should be identified in order to support evaluation of the thickness and distribution of the unconfined aquifer (if present). If the unconfined aquifer is absent, or only present seasonally, we will still need to identify the nature and extent of the confining layer because, just as it inhibits upward movement of groundwater, it will restrict the downward movement of recharge water. Knowing where the confining layer is will provide information on where recharge water may potentially collect atop this layer and where it will potentially spread to.

Mapping for the assessment identified a potential depression in the top of the older Mio-Pliocene conglomerate below the western end, and west of, the test site. The depth, shape, and orientation of this feature will need to be evaluated because it will effect how the aquifer(s) underlying the test site responds to the testing. If an unconfined aquifer indeed underlies the site, this depression may act as a "reservoir" for water introduced into this aquifer. Alternatively, it may serve as a recharge pathway, hydrologically connecting the upper, unconfined part of the suprabasalt aquifer system with deeper, confined parts of the aquifer system.

Hydrogeology

Piezometers and/or observation wells will be constructed in the borings drilled for geologic characterization. If additional geologic characterization boreholes are drilled (either close to or more distal from the test site) one or more of these also may be converted to observation wells. All but one of the boreholes converted to monitoring wells will be completed as 2-inch observation wells that fully penetrate the unconfined aquifer (if present) or above the confining layer (if unconfined aquifer not present). At least one of the geologic characterization boreholes should be of sufficient size to accommodate a 4-inch diameter well which will be used for aquifer testing.

Test site-specific hydrogeologic work would be done, in large part, concurrently with the site-specific geology work. The hydrogeologic assessment concluded that the following information must be collected for the uppermost part of the suprabasalt system at the test site:

1. Depth, thickness, and lateral and vertical extent of the vadose zone and the uppermost aquifer(s) underlying a site.

2. Nature and effect of perching layers (if any) in the vadose zone.

3. Aquifer and vadose zone physical and hydrologic properties - including, grain size, matrix content, induration, hydraulic conductivity, transmissivity, and porosity

4. Groundwater flow direction and velocity, including both spatial and temporal variation

5. Anthropomorphic effects, primarily changes in groundwater pumping, surface water (including canals), and irrigation activities.

For characterization it is important to build monitoring (or observation) wells in such a way as to provide means for accurately measuring the target aquifer. Well construction considerations are listed below:

1. Most project observation wells will probably be 2 inch-diameter piezometer type installations. These should be built to ensure that they are monitoring the anticipated aquifer targets, and we recommend building to well construction standards and avoiding cost cutting measures designed to get more/cheaper wells (these commonly result in poorly built wells unsuitable for collection of the high quality data we feel is necessary to support the project).

2. For aquifer testing, a 4 inch-diameter observation well is the minimum recommended diameter and at least one such well should be built.

3. The minimum number of observation wells at the test site is 3, one up-gradient and 2 down-gradient. If funding can be procured we recommend that more than 3 observation wells be installed. Most, if not all, of these additional observation wells could be built in geotechnical borings drilled for geologic characterization.

In addition to the observation wells built near the test site, it seems likely that observation wells will eventually need to be built more distant from the site. The purpose of these observation wells would be to more accurately trace the down gradient migration of recharge water away from the test site. A minimum of 3 more distant observation wells, 1 up-gradient and 2 down-gradient is again recommended. These might include at least some previously built groundwater supply wells that would be available for use. However, these should only be used if construction details can be verified and if they are not being used as water supply wells. Access to offsite observation well drilling locations will need to be acquired from willing landowners. The WWBWC currently has a network of existing wells that could be used for the purpose of tracking the recharge water distally from the site.

Aquifer testing designed to collect aquifer hydraulic property data will be part of site characterization. During aquifer testing, the 2-inch observation wells will be monitored to observe the effects of testing on the surrounding aquifer. Aquifer testing would include an 8-hour step-drawdown test to establish probable sustainable yields in the suprabasalt aquifer, followed by a 24 to 72 hour constant discharge test. Water level data collected during aquifer testing will be analyzed using standard analysis techniques.

Combining the interpretations developed in the completed hydrogeologic assessment with the drilling and testing data collected during site-specific characterization, a conceptual model of test site hydrogeologic conditions will be prepared.

Surface Water

One of the main objectives of the project is to increase surface water quantity (base flow) and improve its quality (temperature). To document that, surface water bodies that the project may influence need to be identified and monitoring points on them established and characterized (includes collection of baseline data). These locations will be used as monitoring locations during subsequent testing.

The hydrogeologic assessment identified three, down gradient, spring-feed streams, Goodman Spring Branch, Johnson Creek, and Dugger Creek, which are most likely to be affected by recharging the shallow aquifer. During test-site specific characterization these streams will be examined and monitoring points identified. At these points stream conditions will be photographed and stream conditions documented prior to the initiation of testing that will include the following parameters:

Flow volume and discharge

Water temperature

Water quality (temperature)

Hydrophilic plants and habitat quality

Sampling frequency will be designed to collect enough data to demonstrate the range of conditions likely at the monitoring points so that site background conditions can be documented enough to provide an adequate baseline to measure test results against.

Water Quality

Both surface and groundwater quality at the test site, and at likely down-gradient discharge points, needs to be documented. There are several reasons for this, including:

1. We do not want to introduce contaminated water into the shallow aquifer via recharge activities and violate antidegradation rules. We need to establish background water quality parameter concentrations and monitor source-water quality periodically during testing and operations.

2. Certain source-water conditions (e.g., turbidity) have the potential to degrade or even "plug" the recharge system. From an operational standpoint, one would monitor for those conditions and halt test operations when the source-water exceeded those conditions.

3. Up-gradient groundwater quality needs to be monitored so that the effects of recharge on water quality can be differentiated from those water quality conditions caused by recharge activities, including leaching of vadose zone constituents by recharge water.

Sampling Quality Assurance and Quality Control (QA/QC) protocols will need to be established and followed for characterization and later monitoring. QA/QC for the project, which is described in Attachment 5, includes:

- Sampling equipment
- Measurement techniques for field parameters
- Decontamination procedures
- Well purging guidance for groundwater samples
- Sampling methods
- Chain of custody and sample handling procedures
- Record keeping
- QA/QC guidelines

Characterization Conclusions

With the completion of site-specific characterization, updated monitoring and test plans will be prepared if necessary. These monitoring and test plans will be based on the results of the characterization effort which includes the generation of a site conceptual groundwater flow model that describes probable aquifer conditions, suprabasalt aquifer water level(s) and groundwater flow direction(s) (including seasonal variations), and discharge points for recharge water.

Preliminary Test Site Operation Plan

The objective of proposed artificial groundwater recharge testing to be done under the limited license is to evaluate the feasibility of restoring diminished shallow aquifer water levels and increasing decreased spring creek flows using infiltration pits and winter high flow water diverted from the Walla Walla River to these pits. Testing will be done over five years. If testing indicates shallow aquifer recharge and spring creek flow restoration is feasible using infiltration, test results will be used to design and implement larger scale artificial groundwater recharge at this, and potentially other sites in the area. Testing **will not include** removal of stored water by pumping or other artificial means.

This preliminary test plan describes how the test site will be operated during testing. Elements included in the preliminary test plan include: (1) site construction, (2) test operations, (3) mitigation activities, and (4) reporting. The preliminary test plan may be modified as testing proceeds.

Site Construction

The basic layout of the test site is shown on Figure 1. The site, located adjacent to the Hudson Bay Canal, will consist of three infiltration pits excavated approximately 3 feet into Quaternary alluvial gravel which immediately underlies the test site (Attachment 6). Water will be delivered to the pits via a diversion structure in the canal. Any water that does not infiltrate into the ground from these pits will be returned to the canal via a return ditch or pipe.

More detailed site construction information describing: (1) test site survey and layout (2) specifications for pits/basins/pits used for infiltration (3) water supply design (including diversion from canals if appropriate) (4) monitoring points (both on and off site) and (5) site access controls (fences, etc.) are described in detail in Attachment 1, (1A-1E), Engineering Design.

Test Operations

Test operations describe how the site will be used during testing and possible reasons for changing the test as new data and information is collected during the test. Test operations include:

1. Test timing, including timing of recharge and monitoring frequencies
2. Quantities of water used
3. Outside influences that effect test, including weather (probably freezing), elevated river turbidity, river flooding, trip wires for identifying potential offsite impacts before they occur so they can be mitigated and or testing suspended to prevent worsening conditions
4. Responsible parties for diversion and delivery of water, operation of test, monitoring, and data review
5. Permissions required to access offsite monitoring points

These are discussed further in the following paragraphs.

Test Timing, Monitoring, and Water Quantities

Testing is tentatively planned to begin in the winter of 2003/2004 and continue for 5 years. Test operation will generally be conducted in the winter when Walla Walla River flows are at their highest and irrigation activities are at their lowest. A maximum of approximately 50 cfs will be delivered to the test site during normal operation. However, in the event minimum Walla Walla River flows are not meet, water will not be diverted from the river for test site use. Depending on stream flows in any given year, recharge water may be delivered as early as December to as late as March/April. In addition, in the event of prolonged freezing weather, test site operation may be temporally suspended to avoid ice damage to the canal diversion on the Walla Walla River, the canal system itself, and/or the recharge pits and related structures.

Water quantities delivered to the test site will be monitored via a gauge at the diversion from the canal into the test site. The return canal from the test site back into the canal will also be monitored to determine the quantity of water that leaves the test site (if any) because it did not infiltrate into the ground. Based on this monitoring data, and estimated evaporation loses that could occur during operation; water quantities discharged to the ground will be calculated.

Groundwater levels in the immediate vicinity of the test site will be monitored before, during, and following recharge test events via three (at a minimum) observation wells constructed during characterization, potentially via existing water wells in the area if any can be found that can be used for shallow aquifer water level monitoring, and potentially with new observation wells built as the test progresses. During the recharge test event, tentatively scheduled for the winter/spring of 2003/2004 water levels will be measured as follows:

1. Throughout the calendar year water levels will be measured at least weekly, beginning with the granting of the limited license.

2. In the month prior to the anticipated start of recharge activity and in the month following the termination of recharge, water levels will be measured daily.

3. During recharge water levels will be measured daily, at a minimum.

Based on preliminary engineering design studies (Attachment 1) and the hydrogeologic assessment (Attachment 6) most, if not all, of the water delivered to the test site will probably infiltrate into the ground. However, because this project is a test project, the current plan is to initially operate the test site at approximately half capacity. The quantity of water discharged to the site will than be increased or decreased as experience and observations dictate. Final operating quantities will determined based on test results.

Water quality data will also be collected before, during, and following recharge events. Parameters to be collected, sampling timing, and other water quality monitoring information are presented in the Monitoring Plan (Attachment 5).

Outside Influences

The primary currently identified outside influences on testing are Walla Walla River flow levels, freezing conditions, source water turbidity levels, and increased groundwater water levels resulting from testing that impact surface activities and conditions. The likely effects of these on testing, and possible mitigation actions to be implemented during testing, are as follows:

Low flows in the Walla Walla River will impact testing because the use of Walla Walla River water for recharge will be conditional, based on river flows exceeding a certain threshold. When flows do not, water will not be delivered to the test site and testing will not occur.

High Walla Walla River flows may also effect testing. In the event of high flow during a flood or rapid snow melt event, turbidity will generally increase. The repeated delivery of turbid water to the test site infiltration pits may eventually lead to plugging of pore space and reduced infiltration capacity. To mitigate against this, delivery of recharge water may be terminated or scaled back during high flow events. Alternatively, the pits may be periodically re-excavated to remove these fines. The preferred mitigation strategy for dealing with this will be based on monitoring and performance data collected during testing.

The effects of freezing on the test are outlined earlier in this Attachment and repeated here. In the event of prolonged freezing weather, test site operation may be temporally suspended to avoid ice damage to the canal diversion on the Walla Walla River, the canal system itself, and/or the recharge pits and related structures and to avoid the risk of ice jams forming in the canal, backing up water in the canal, and causing flooding adjacent to the canal.

It is possible that recharge testing could cause groundwater levels to reach the ground surface at locations where human activity and habitat is negatively impacted. One of the main purposes of

groundwater level monitoring is to identify increasing water levels in the test site area in order to: (1) directly observe the effects of recharge on water levels (2) use these observations (in conjunction with characterization data) to evaluate whether or not recharge is having an impact on groundwater levels that could lead to surface problems, and (3) identify when and where this type of problem may occur. If water level monitoring data suggest increased groundwater levels are approaching the ground surface and that flooding of low lying areas seems possible, the quantity of recharge test water being delivered to the infiltration pits will be reduced or, if necessary, terminated.

Responsible Parties and Access Permission

The test will be managed primarily by the Hudson Bay District Irrigation Company, lead by John Brough, Operations Manager, and the Walla Walla Basin Watershed Council (WWBWC) technical staff, lead by Mr. Bob Bower, Hydrologist. HBDIC and WWBWC staff (or a subcontractor working for the HBDIC and WWBWC) will compile monitoring and testing data, prepare reports as necessary to meet license requirements, and in consultation with Hudson Bay Irrigation District (HBDIC) staff make decisions regarding timing and quantity of water delivered to the site and when to suspend recharge activities. Submittal of all monitoring reports to OWRD will be the responsibility of HBDIC and WWBWC staff. The HBDIC and WWBWC may choose to subcontract report preparation and delivery to a subcontractor.

HBDIC staff will be responsible for operating all facilities associated with removing recharge test water from the Walla Walla River and delivering it to the test site, including operation of the diversion structure which routes water from the canal into the pits. HBDIC staff also will maintain all equipment associated with water delivery and pit operation, including reexcavation of the pits, if necessary.

Mitigation

As stated above, one of the objectives of monitoring is to identify likely unintended consequences of recharge testing before they occur. When the precursors to these consequences, such as changing water quality detrimental to aquatic habitat or groundwater levels rising to close to the surface in areas where shallow groundwater is not desired, can be detected soon enough via monitoring, recharge activities will be modified and/or terminated to mitigate against these effects.

Reporting

Data and observations collected during testing, including monitoring data, will be compiled into reports. The basic objective of these reports will be to describe what was done during the test, what was observed at the monitoring points, interpret the data collected, and recommend changes to testing, monitoring, and mitigation plans. These reports will be produced annually. Based on the proposed recharge schedule, annual reports will be submitted to OWRD in the summer following each winter recharge test.

More frequent reporting will be done when monitoring reveals the presence of an undesired effect from testing. If monitoring reveals that undesired consequences of testing are likely to occur, WWBWC staff (or designated representative) will report the monitoring information to OWRD staff.

At the conclusion of the 5-year recharge testing done under the limited license a final report will be prepared. The final reports will describes the project, data colleted during testing and monitoring, interpretations of how well the recharge project worked in achieving project goals, and recommendations for future operations. The final report will be submitted to OWRD in the summer following the fifth annual winter recharge event.

Attachment 5. Proposed Monitoring Program, 690-350-0020(3)(b)(A)

Overview of Basin Wide Monitoring Plan

In 2003, the WWBWC expanded its watershed monitoring strategy to include collecting basin line information for the numerous spring-creeks and district ditches spread out across the Walla Walla River valley (Oregon). Starting in June 2003, many new flow stations (15-minute stage and temperature recorders) were installed at or near the sources of nearly all the springs in the Oregon portion of the system (Figure 2). The WWBWC monitoring program has a total of 28 continuous flow stations with additional 15 continuous static well recorders with many more manual measurement locations. The objectives of this monitoring (specifically for the spring-creek and shallow aquifer system) is to accomplish the following:

1. Be able to discern between Walla Walla River Water (coming from districts water rights and use) and spring waters (emerging strictly from the shallow aquifer). It is understood that the application of irrigation water will undoubtedly show up as spring returns, but this monitoring is intended as a beginning to understanding this complicated system.
2. Collect baseline information on spring flow as it relates to seasonal and yearly fluctuations.
3. Many of the spring-creek monitoring stations were sited based on the presence of historical data collected by Piper (USGS, 1933). Where Piper had collected spring-creek flow, we attempted to locate our gauges as near as possible to his historic data sites. The intention is to allow us the ability to compare and contrast historical and current spring-creek conditions based on a significant period of time. Most of these Piper's original sites were located upstream of any irrigation with draws, making them key locations for us in this type of comparison.
4. Monitor water table levels continuously for daily, seasonal and yearly fluctuations and timing. Some of the wells being recorded have periods of record dating back to the 1930s, allowing us some opportunity to understand any long-term changes in the aquifer system.

Recharge Project Monitoring Plan

The proposed ground water recharge project exists inside this larger monitoring network and it is expected that this will help provide useful information in testing of the proposed testing (see below). Some of the sites shown in this larger network were specifically located to provide proximal and distal pre-construction and operation information for this project (Figure 2). Site specific monitoring includes observation wells and surface monitoring stations (Attachment 5B).

Monitoring for the site-specific proposed testing is designed to meet four basic objectives. These are to identify: (1) changes in the natural system caused by factors other than those related to testing, (2) changes in the natural system caused by the testing (track the test performance), (3) potential problems caused by the testing that may require modification or termination of the test and/or mitigation actions, and (4) events that effect test operations, such as a freezing or a flooding. To meet these objectives, monitoring will track:

1. Source water quality and volume coming onto the test site

2. Up-gradient groundwater water quality

3. Up-gradient groundwater level changes to provide the information needed to differentiate recharge test effects from other, natural and artificial, effects on the groundwater levels beneath test site

4. Down-gradient groundwater quality and levels, both near and distal to the test site

5. Surface water discharge and quality changes

Four basic types of monitoring points are planned for this project:

1. Source water

2. Test site groundwater

3. Distal groundwater

4. Surface water (e.g., springs).

Monitoring data collected at these points during testing will be evaluated against what is known about pre-test conditions to identify testing effects on the surrounding environment, differentiate those effects from others in the environment, and identify when changes in test operations appear necessary. Pre-test conditions will be determined during the planned site-specific characterization activities described in Attachment 4 and are partially described in the preliminary hydrogeologic assessment (Attachment 6).

This preliminary monitoring plan discusses monitoring activities to be undertaken at the four types of monitoring points and sampling and QA/QC protocols.

Sampling and Analysis Program

The groundwater-monitoring program proposed for the test project is outlined in the following sections. Annual reporting is proposed and a Water Quality Analysis Report will be prepared following five years of testing.

As stated in the introduction, four types of monitoring are proposed: (1) source water at the test site (2) site-specific groundwater (3) distal groundwater and (4) surface water (springs).

(1) Source Water at Test Site

Source water monitoring will be at the point of diversion onto the test site. Monitoring will include both water quantity and quality. The volume of water delivered to the test site will be monitored via a gauge at the diversion. Water quality samples will be collected at the gauge.

Proposed monitoring frequency is as follows:

Gauge data will be recorded 15-minute readings via a continuous recording data logger. Rating measurements and tables will be generated for each surface flow site and continuously checked for shifts.

Three source water quality-sampling events are proposed for each yearly seasonal recharge period. They are proposed for approximately: (1) one month prior to the projected beginning of the recharge period (2) during the mid part of the recharge period and (3) approximately one month following the end of the recharge period. The exact timing of these will be based on predicted Walla Walla River flows and may vary from year-to-year. OWRD and ODEQ staff will be notified by WWBWC staff of pending sampling events at least two weeks prior to each sampling event.

The results of source water quality monitoring will be used to determine if modifications to test operations are warranted. During testing different sampling frequencies may be tried to identify those that are most effective.

(2) Site Groundwater

Site groundwater monitoring, consisting of the collection of water quality and water level data, will be conducted at the three observations wells built during characterization. The purpose of site groundwater monitoring is to establish water quantity and quality impacts from testing to groundwater in the immediate vicinity of the site. In addition, up-gradient monitoring will be used to differentiate test impacts from those caused by other activities not controlled by the testing.

Proposed monitoring frequency is as follows:

Water levels will be measured weekly throughout the year when recharge testing is not underway.

In the month prior to, during, and the month following the yearly seasonal recharge period, water levels will be collected daily (at a minimum) for the first year of testing. Measurement frequency during subsequent years will be based on previous observations and proposed in annual reports.

Three groundwater quality sampling events are proposed for each yearly seasonal recharge period. They are proposed for approximately: (1) one month prior to the projected beginning of the recharge period (2) during the mid part of the recharge period and (3) approximately one month following the end of the recharge period. The exact timing of these will be based on predicted Walla Walla River flows and may vary from year-to-year. OWRD and ODEQ staff will be notified by WWBWC staff of pending sampling events at least two weeks prior to each sampling event.

The proposed locations of site-specific groundwater observation wells are shown on Figure 1. The results of groundwater quality and level monitoring will be used to determine if modifications to test operations are warranted. During testing different sampling frequencies may be tried to identify those that are most effective.

(3) Distal Groundwater

Distal groundwater monitoring, consisting of the collection of water quality and water level data, will be conducted at observation wells more distal from the test site than the site observation wells. Initially, during the first year of recharge testing, these wells will probably be previously constructed water supply wells that can be used by WWBWC staff and can be shown to be open to only the shallow aquifer. If funding for new wells can be procured for subsequent years, dedicated distal groundwater observations wells may be built to improve the monitoring coverage.

A minimum of 3 distal observation wells will be used, 1 up-gradient and 2 well down-gradient. The locations of these will be determined during site specific characterization currently planned for the winter of 2003. Monitoring frequency is the same as proposed for site-specific groundwater monitoring. Figure 5B shows the approximate site locations for the site-specific observation wells.

Distal monitoring will be used to identify longer term quantity impacts from testing. This includes the formation and migration of a groundwater mound and recharge water plume at, and away from, the test site, towards intended and unintended receptors. Up-gradient monitoring will be a part of this so that testing effects can be differentiated from offsite events. Sampling frequency will be determined from characterization data and modified as more is learned during testing.

(4) Surface Water (Springs)

The WWBWC is currently monitoring most of the surface springs, creeks and rivers of Oregon's lower Walla Walla River basin (See Figure 2.) While this project will specifically Surface water monitoring in Dugger, Johnson and Goodman Spring-Creeks will be done to identify the effects of recharge on flow. This monitoring will include the collection of both water quality (specifically temperature), flow and habitat improvements (photo-documentation). As with groundwater monitoring, surface water monitoring will need up-gradient and pre-project condition monitoring information so that effects unrelated to test site operations/testing can be differentiated from those due to testing. Pre-project surface flow monitoring was started during the 2003 summer irrigation season at Dugger and Johnson Spring-Creeks in the form of a continuous.

Sampling Parameters

Sampling methods are specified in the following sections. The chemical monitoring parameters are to be conducted on a two-tiered system. Level 1 monitoring will be conducted during all three water quality-monitoring events (each recharge period). Consistently elevated concentrations of nitrate will be initiate the level 2 chemical analysis. Samples will be tested for chemicals in the level 2 list. Operation of the recharge project will depend on the absence/presence of the chemical parameters on this list. ATTACHMENT 5B describes the specific method and documents used to determine the level 1 and 2 chemical parameters (pesticides, herbicides, insecticides, fungicides, etc.) listed below.

Monitoring is proposed for the following parameters:

Physical Parameters (all monitoring types)

Static water level (in observation and WWBWC network well)

Standard field parameters, including pH, turbidity, electrical conductance, and temperature

Flow (in cubic feet per second)

Chemical Parameters –Level 1 (On-site monitoring only)

Total nitrogen as nitrate (screening parameter for Level 2 Chemical screening)

TKN

Total dissolved solids

Chemical oxygen demand

Chloride

Orthophosphate

Fecal Coliforms (Presence/absence only)

Chemical Parameters –Level 2 (On-site monitoring only)

Rubigan (Fenarimol)

Ridomil (Metalxyl)

Systhane/Rally (Myclobutanil)

Devrinol (Napropamide)

DDD-DDE-DDT

Elgetol (DNOC sodium salt)

Alar/B-Nine (Daminozide)

Lindane (Lindane)

Sampling dates will be coordinated for all monitoring points used in the project.

This list of analytes was selected to optimize routine sampling to address constituents commonly of concern (nutrients and salt) and provide prompt indication of potential impacts by analyzing for anions (nitrate and chloride) that are known as groundwater tracers (DEQ, 1995). Additional parameters will be proposed for future sampling if the results of the initial proposed sampling indicate this is necessary.

Sampling Procedure
Equipment and sampling procedures proposed for recharge test monitoring are provided in the following sections.

Equipment
This section lists the equipment for groundwater monitoring.

Submersible pump (*Grundfos* or similar) or dedicated bailers/sampling line

Temperature measuring instrument (*Vemco* data logger)

pH and conductivity meter(s) with calibration reagents

Water level and flow meters (*Tru-traks, In-situ Mini-trolls, Stevens 420 loggers,* 0.01 foot resolution required)

Shipping cooler with ice packs or ice

Five-gallon pail marked at the 5-gallon level, stopwatch

Laboratory supplied sample containers with appropriate preservatives

Tap water, deionized water, phosphate-free soap, cleaning brushes, field note book, log sheets

Water Level
An electronic water level meter will be used to measure the depth to groundwater in each observation well to the nearest 0.01 foot. Static water levels must be measured at the indicated reference point prior to purging any water from the well. The reference points will be on the top of the observation well casings. The static water levels in all wells should be measured on the same day for each site. Coordination with quarterly sampling of other wells in the vicinity should be attempted. Accumulation of sediment in the well should also be checked by lowering a weighted tape to the bottom of the well, reading the depth at the well casing's reference point, and comparing this value to the as-built well depth.

Decontamination

All non-disposable field equipment that may potentially come in contact with any soil or water sample shall be decontaminated in order to minimize the potential for cross-contamination between sampling locations. Thorough decontamination of all sampling equipment shall be conducted prior to each sampling event. In addition, the sampling technician shall decontaminate all equipment in the field as required to prevent cross-contamination of samples collected in the field. The procedures described in this section are specifically for field decontamination of sampling equipment. At a minimum, field-sampling equipment should be decontaminated following these procedures:

1. Wash the equipment in a solution of non-phosphate detergent (Liquinox® or equivalent) and distilled/deionized water. All surfaces that may come in direct contact with the samples shall be washed. Use a clean Nalgene and/or plastic tub to contain the wash solution and a scrub brush to mechanically remove loose particles. Wear clean latex or plastic gloves during all washing and rinsing operations.

2. Rinse twice with distilled/deionized water.

3. Dry the equipment before use, to the extent practicable.

Purging and Field Parameters (On site wells only)

Sufficient water will be purged to ensure that the sample collected represents water from the geological formation. Borehole volumes are calculated as the volume of water in the casing and the volume of water in the filter pack.

During purging, measure pH, temperature, and electrical conductivity of the water removed. At a minimum, these parameters are measured at the start of purging and after each successive borehole volume is removed. Temperature should be measured first because it changes most rapidly. Purging continues until at least three borehole volumes have been purged and the field parameters are established to within ± 10 percent over three consecutive measurements. At this point, the observation well is considered adequately purged and can be sampled.

Occasionally, observation wells installed in low permeability formations may be purged nearly dry (within 6 inches of bottom of well) prior to stabilization of groundwater parameters and prior to purging at least three borehole volumes. If this happens at least one set (more if possible) of purge water groundwater parameters (pH, temperature, EC) need to be measured. Sample collection can be done after the water level has recovered at least 75 percent of the drawdown ensuring most of the well water is from the formation. Prior to groundwater sample collection several measurements are required as explained above. These include static water level and total depth, pH, temperature, and electrical conductivity.

All field instruments should be calibrated each day prior to sample collection. Instrument calibration and maintenance should precisely follow the manufacturers recommended procedures. Electrical conductivity and pH standards used to calibrate the instruments should be within the range encountered at the monitoring sites. Calibration records should be recorded on the sample collection forms.

Water Sampling

Samples will be collected after sufficient water has been purged according to the procedure described above. Samples will be collected from the discharge end of the pump hose after the flow rate has been reduced to less than approximately 0.2 gallons per minute. Discharge from a bailer should be controlled to minimize agitation and aeration. Sample containers should be sealed with tape, labeled, and immediately placed in a cooler with ice. Sample containers should be filled completely to eliminate head space. Sample containers should be provided by the analytical laboratory and should be requested at least one week in advance of the sampling. The containers should be appropriate for

the parameters analyzed and all shipping coolers should have chain-of-custody seals placed on them prior to shipping.
One additional sample should be collected from one of the sample points for quality control purposes. This sample should be evaluated as a "blind duplicate."
Sample Preservation and Holding Time. Samples should be stored immediately after collection in an ice chest containing sufficient ice to cool the samples to 4 degrees Celsius (°C). Use "blue ice" if possible. If water ice must be used, the ice should be sealed in plastic bags, as should the sample bottles. Samples should remain cooled at 4°C and delivered to the laboratory within 24 hours of collection. Sample receipt at the laboratory must be sooner if analysis includes parameters with a shorter holding time. Care should be taken to prevent excessive agitation of samples or breakage/leakage of containers. Samples should be analyzed within the specified holding time for each constituent.

Resampling
In accordance with OAR 340-40-030(5), resampling is done if monitoring indicates a significant increase (or decrease for pH) in the concentration of a monitored parameter at a sampling point. Determining if a significant increase in parameter concentration has occurred is customarily done either by assessing concentrations in relation to established concentration limits or by using a statistical analysis. Since background or baseline conditions have yet to be established for the test site a concentration limit has not been set and insufficient data exists upon which to base a statistical analysis. The criteria to guide resampling decisions will be reevaluated is subsequent test project annual reports.

Chain of Custody and Sample Handling
A chain-of-custody form should be completed and signed by the sampler on the day samples are collected. The chain-of-custody form must be signed by laboratory personnel upon receipt and any other individuals that maintain custody of the samples in the interim. Coolers should be sealed and shipped or driven to the lab as soon as possible. The method of shipping (bus, next day air, etc.) is usually determined by the parameter having the shortest holding time. In any case, shipping times of more than 24 hours should not be used as the cooler(s) may warm and compromise sample quality.

Field Records and Data Validation
All field notes, analytical results, and other pertinent data associated with the project should be maintained in a secure location and be archived for at least a five-year period. Data validation for both field and lab Quality Assurance and Quality Control (QA/QC) will be performed using a checklist. All pertinent information with respect to QA/QC will be checked.
The following items are included on the QA/QC review checklist:

1. Field data sheets (or notebooks) and observations (observations are used to check for potentially erroneous data) will be reviewed to make sure they are completely filled out.

2. Chain-of-custody forms will be completed, being signed by all sample handlers.

3. Holding times for all constituents will be met.

4. Field blind duplicate results will be evaluated to make sure they are compatible.

5. Laboratory method blanks, matrix spike, matrix spike duplicates, and surrogate percent recovery data supplied by the analytical laboratory will be evaluated to make sure they are compatible.

Data Reporting and Statistical Analysis
The following procedures for reporting analysis are proposed for this project.

Record Keeping
All field notes, laboratory results, critical calculations, and published reports will be maintained at the WWBWC office for a period of five years following completion of the final testing and monitoring report. If possible, both paper and electronic copies will be maintained.

Evaluation
Monitoring data and observations should be evaluated when they are received from the sampler and laboratory.

Materials to be received include:
Field monitoring and sample collection records

Original laboratory reporting sheets

Data evaluation will include:

1. Verification of analytical methods and detection limits, along with the date the analysis was performed

2. Review of document handling, sampling and analytical problems, and actions taken to correct any problems

3. Summarizing water level data in tabular and/or graphical form

4. Summarizing water quality analytical results in tabular form and/or graphical form

5. Performing data validation checks, as appropriate to the data set

6. Identifying any significant increases in parameter concentrations (will be done later in project only after enough data has been collected to warrant)

Annual Review and Reporting
All monitoring activities performed during the previous monitoring year will be included in an annual report to be submitted to OWRD during the summer following the preceding seasonal recharge period. The annual report will present the following information:

Water quality data, including duplicate sample results in tabular form and time-series plots for specific parameters

Water level data, including hydrographs showing water level changes over time

Basic statistical parameters for each parameter of interest: mean, median, maximum, minimum, standard deviation, number of data points, and number of non-detects

Evaluation of all field and laboratory data, including observed changes and groundwater flow direction and gradient

Discussion and conclusions, including recommended changes to recharge testing

The methods needed to evaluate water quality and water level data will depend on the objectives of the evaluation. In general, the principal objective is to evaluate whether or not recharge tests have affected groundwater levels and quality. Evaluation methods include: a comparison of water quality data with a concentration limit or with background water quality; comparison of water quality over time; or comparison of water quality between up-gradient and down-gradient wells. For the test site, insufficient data are available for a statistical analysis to be performed because concentration limits have not yet been established. Until that time, evaluation of dataset trends will be solely qualitative, but revisited in each annual report until a database has been compiled that is sufficient for statistical analysis.

Final Recharge Test Project Report

At the conclusion of five years of recharge testing under the limited license a final report will be prepared. The report will contain the data collected for the test project; analysis and interpretation of that data (including statistical analysis as appropriate), and a recommendation for proposed future artificial groundwater recharge activities at the test site. The report will be complete enough to serve as supplemental material to a permanent artificial groundwater recharge permit under OAR 690-350-0110, if such a permit is sought following completion of the test project.

Monitoring Plan Attachments

Attachment 5A. Methodology Water Quality Assessment and Evaluation
Attachment 5B. Figure 5A Map of On-site Recharge Well Locations
Attachment 5C Chemicals of interest for Hudson Bay Recharge Project

Attachment 6. Site Hydrogeology, 690-350-0020(3)(b)(C), (E), and (G) (attached)

Attachment 7. Source Water Quality, 690-350-0020(3)(b)(D)

Overview

This project will utilize winter-spring flow from the Walla Walla River as the *source* water for recharge during the project operation. The time period that Walla Walla River water will be used is November 15th through May 15th. A review of existing reports and data was conducted to identify any areas of concern regarding source water quality for the recharge project. What little information that exists for source water quality conditions is discussed below.

In 2003, the WWBWC tracked turbidity levels through a winter storm event (1/27/3 through 2/3/3) and found turbidity levels to be a potential issue on the Walla Walla River (mainstem) during peak flow events (WWBWC, Unpublished data). Turbidity could be problematic for project operations, as it may act to decrease the rate of infiltration by plugging and layering the bottom of the recharge pits. Turbidity may also be a preliminary screen for fecal contamination issues, as bacteria may use the large particles as a vector for mobilization.

The other known source water quality information was obtained from the Environmental Protection Agencies STORET database. STORET provided some historical water quality data that showed several parameters (circa 1960s) that were accounted for in the recharge project's monitoring plan (ATTACHMENT 5). STORET data that was collected nearest to the source water POD at the Little Walla Walla Diversion (*NE ¼ NW ¼, Section 1, SW ¼ NE ¼ Section 12, T5N, R35E, W.M.; DIV.PT. 1*) is attached in table form as ATTACHMENT 7A.

From the review of all known source water information, the parameters that appeared to be of concern are:

1. Fecal Coliforms
2. Turbidity

There was no other relevant information found for source water quality conditions. The monitoring plan covers the establishment of source water quality conditions during operation of the recharge facility. This will insure safe water quality conditions for the recharge project.

Attachment 7A Source Water Quality Information

Resources and References:

Cooperative Extension Washington State University. 2002. *2002 Crop Protection Guide for Tree Fruits in Washington.* Washington State University EB0419.

Darnell, T., Topielec, R. 1996, October. *Nitrates and Bacteria in Groundwater: A Second Look, Milton-Freewater Area, Umatilla County, Oregon.* Oregon State University Extension Service Water Quality Program.

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Darnell, T., Montgomery, M. L., Witt, J. M., 1989, July. *Pesticides in Groundwater: Milton-Freewater, Umatilla County, Oregon.* Oregon State University

EPA STORET Water Quality Database information (http://www.epa.gov/storet/)

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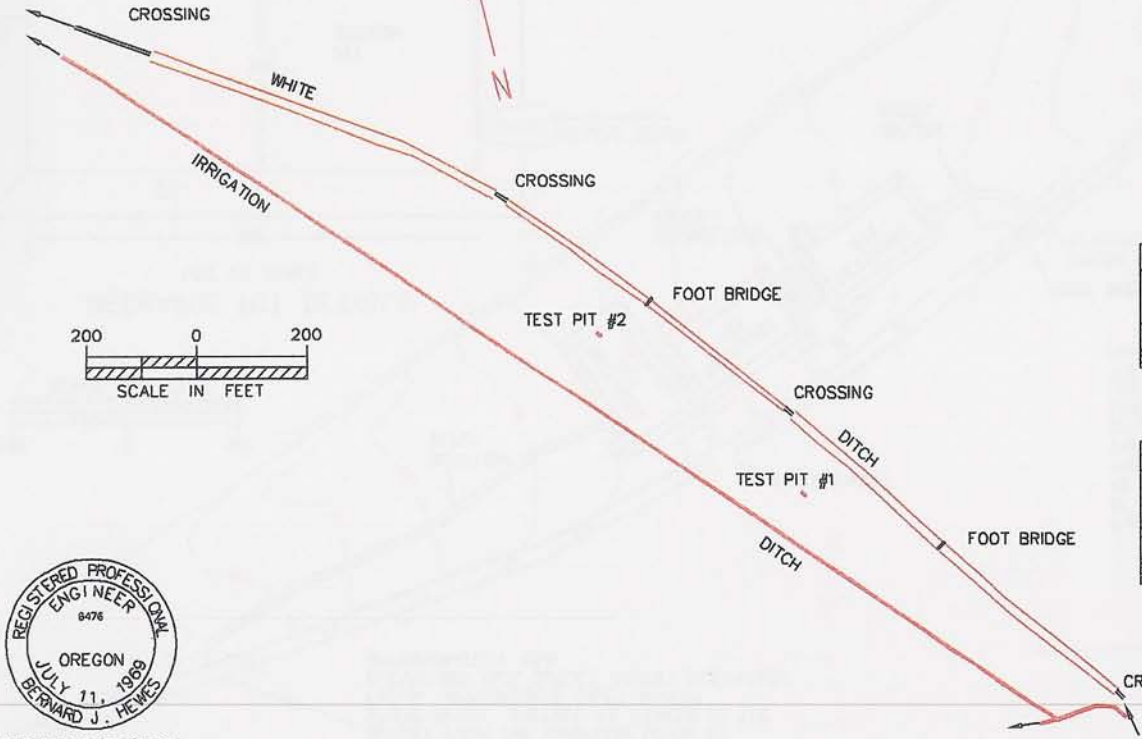
Attachments

Attachment 1A

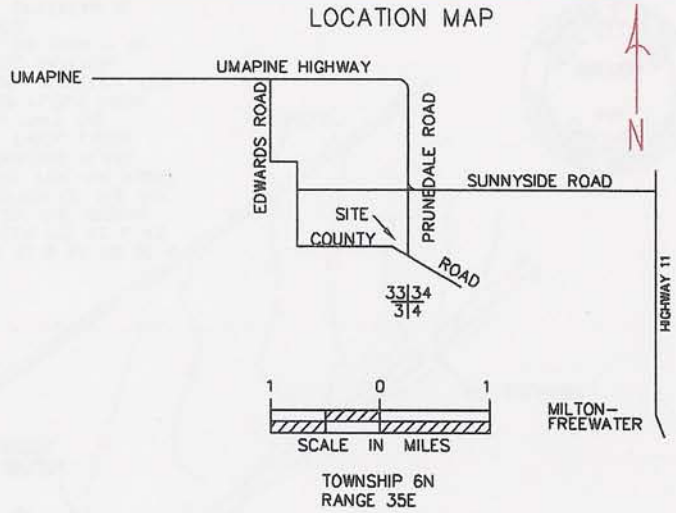
SITE PLAN VIEW



REGISTERED PROFESSIONAL ENGINEER 6476 OREGON JULY 11, 1969 BERNARD J. HEWES

EXPIRES 6/30/2003

LOCATION MAP



TOWNSHIP 6N
RANGE 35E

TEST PIT #1

0–12" SANDY LOAM
12"–36" GRAVELLY SANDY LOAM, APPROX. 50 % OF THE VOLUME IS GRAVEL SIZE PARTICLES WITH AN ESTIMATED D_{50} SIZE OF ABOUT 0.75".
36"–48" SANDY LOAM
48"–? GRAVELLY SANDY LOAM APPROX. 20% OF THE VOLUME IS GRAVEL SIZE PARTICLES.

TEST PIT #2

0–13" GRAVELLY SANDY LOAM
13"–39" COBBLY SANDY LOAM, THE D_{50} OF THE GRAVEL IS APPROXIMATELY 1"
39"–52" GRAVELLY SANDY LOAM
52"–? SAND GRAVEL MIX D_{50} ESTIMATED TO BE ABOUT 0.25".

TBM #1 LOCATION IS AT THE TOP OF THE WALL ON THE NORTH WEST CORNER OF A CONCRETE TURNOUT BOX ON THE LEFT SIDE OF WHITE DITCH NEAR THE UPSTREAM END OF A 44"X72" CMP. PAINTED RED SPOT. ELEVATION 100.00.

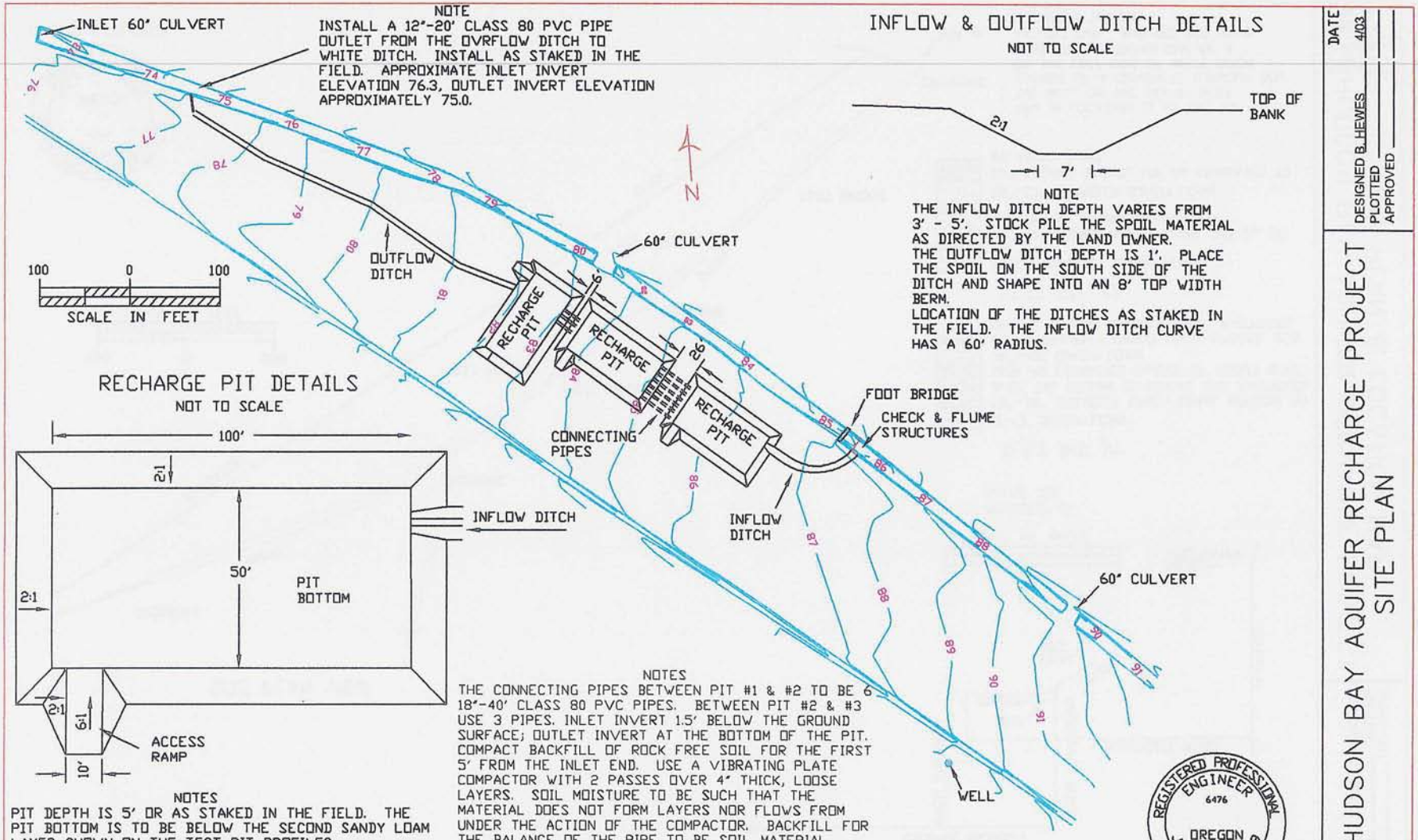
DATE 4/03
DESIGNED B. HEWES
PLOTTED
APPROVED

HUDSON BAY AQUIFER RECHARGE PROJECT
SITE PLAN & LOCATION MAP

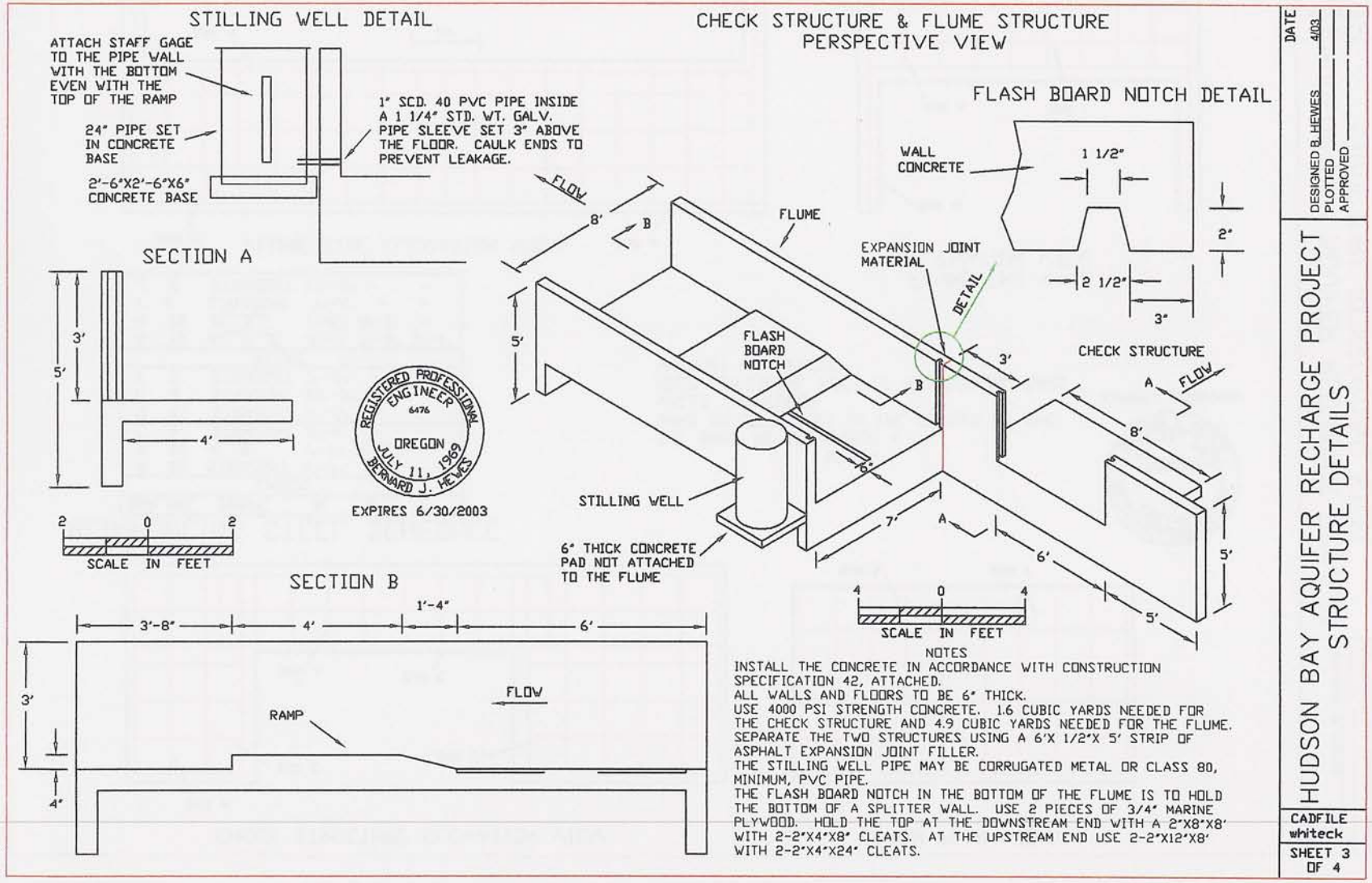
CADFILE whitereloc

SHEET 1 OF 4

Attachment 1B



Attachment 1C



NOTES

INSTALL THE CONCRETE IN ACCORDANCE WITH CONSTRUCTION SPECIFICATION 42, ATTACHED.
ALL WALLS AND FLOORS TO BE 6" THICK.
USE 4000 PSI STRENGTH CONCRETE. 1.6 CUBIC YARDS NEEDED FOR THE CHECK STRUCTURE AND 4.9 CUBIC YARDS NEEDED FOR THE FLUME.
SEPARATE THE TWO STRUCTURES USING A 6'X 1/2"X 5' STRIP OF ASPHALT EXPANSION JOINT FILLER.
THE STILLING WELL PIPE MAY BE CORRUGATED METAL OR CLASS 80, MINIMUM, PVC PIPE.
THE FLASH BOARD NOTCH IN THE BOTTOM OF THE FLUME IS TO HOLD THE BOTTOM OF A SPLITTER WALL. USE 2 PIECES OF 3/4" MARINE PLYWOOD. HOLD THE TOP AT THE DOWNSTREAM END WITH A 2"X8"X8' WITH 2-2"X4"X8' CLEATS. AT THE UPSTREAM END USE 2-2"X12"X8' WITH 2-2"X4"X24' CLEATS.

DATE 4/03
DESIGNED B. HEWES
PLOTTED
APPROVED

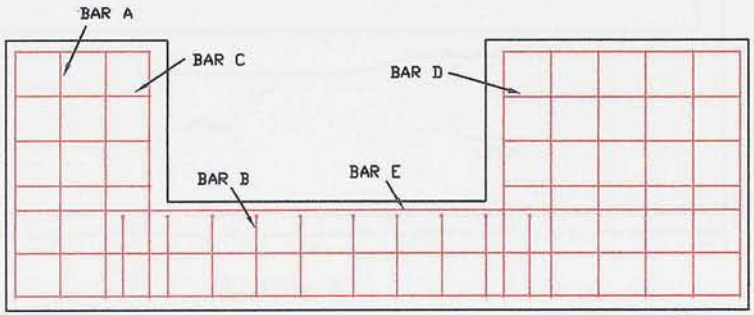
HUDSON BAY AQUIFER RECHARGE PROJECT
STRUCTURE DETAILS

CADFILE whiteck

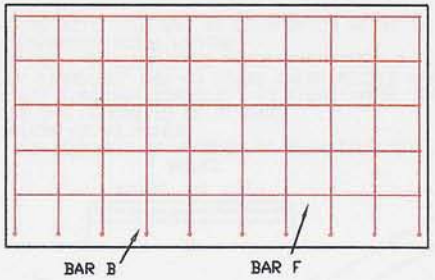
SHEET 3 OF 4

Attachment 1D

CHECK STRUCTURE ELEVATION VIEW



APRON PLAN VIEW



REINFORCING STEEL SCHEDULE

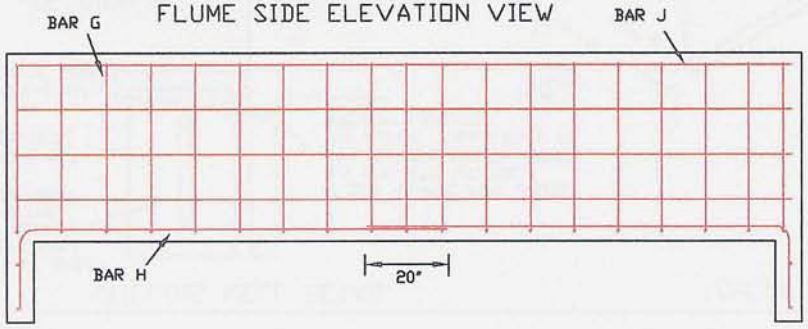
BAR	NO.	SHAPE	A	B	C
		CHECK			
A	10	STRAIGHT	4'-7"	-	-
B	10	AL B	1'-7"	4'-1"	-
C	4	STRAIGHT	2'-6"	-	-
D	4	STRAIGHT	4'-6"	-	-
E	3	STRAIGHT	13'-8"	-	-
F	5	STRAIGHT	7'-8"	-	-
		FLUME			
G	19	AL B C	3'-1"	7'-6"	3'-1"
H	20	AL B	1'-6"	8'-1"	-
I	4	STRAIGHT	7'-6"	-	-
J	8	STRAIGHT	14'-6"	-	-

REGISTERED PROFESSIONAL ENGINEER 6476 OREGON JULY 11, 1969 BERNARD J. HEWES

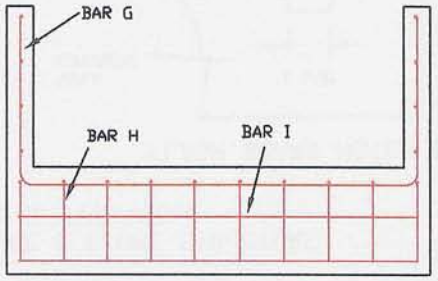
EXPIRES 6/30/2003

NOTES
ALL BARS TO BE NUMBER 4.
BARS TO BE PLACED IN THE CENTER OF THE WALLS AND FLOOR.
NEED 820 LINEAL FEET OF REINFORCING BARS WITHOUT ANY WASTE.

FLUME SIDE ELEVATION VIEW



FLUME END WALL ELEVATION VIEW



DATE 4/03
DESIGNED B. HEWES
PLOTTED
APPROVED

HUDSON BAY AQUIFER RECHARGE PROJECT
STRUCTURE REINFORCING STEEL

CADFILE whiteckst

SHEET 4 OF 4

Attachment 1 E

HUDSON BAY AQUIFER RECHARGE PROJECT

ENGINEERING REPORT

This project entails diverting water from an existing irrigation ditch to three pits to be excavated for the purpose of infiltrating the water into the shallow aquifer. Project features include a concrete check structure in the existing White Ditch, a concrete flow measuring flume, an open ditch, three excavated pits, pipes connecting the pits and an outflow ditch from the down stream pit.

These items were sized to handle 50 cubic feet per second (cfs) of water. This is the amount anticipated will be available from excess flow in the Walla Walla River and that the Hudson Bay District is able to deliver.

Data gathered to design the project consisted of a site topographic survey and installing two sites for testing the water infiltration capacity of the natural materials and determining the layers in the soil profile. In addition the Soil Survey of Umatilla County Area, Oregon was consulted. This is a US Dept. of Agriculture, Natural Resources Conservation Service publication giving general soils information.

The topographic survey data was used to prepare a topographic map with one foot contour intervals at a scale of 1" = 60'. This information was used to help determine the location of the project features.

Two test pits were excavated to a depth of 6'-7' each. A 24" diameter by 5' long section of corrugated metal pipe was set on end in the bottom of the pit and about one foot of fill placed around it to hold it in place. Water was pumped into the pipe at a rate that would sustain a water depth of one foot in the pipe. Both flow rate and total flow was measured. The test was run for 6.25 hours in the first pit and 3.5 hours for the second pit.

PIT #1
Soil profile:
0-12" sandy loam
12"-36" gravelly sandy loam, approximately 50% of the material volume is gravel size particles with an estimated D_{50} size of about 0.75"
36"-48" sandy loam, in parts of the trench this layer does not exist
48"-?" gravelly sandy loam approximately 20% of the volume is gravel size particles

The inflow rate at the end of the test period was 4.0 gallons per minute (gpm). This resulted in an infiltration rate of 1.7 gpm/sq. ft./ foot of head.

PIT #2
Soil profile:
0"-13" gravelly sandy loam
13"-39" cobbly sandy loam, the D_{50} of the gravel is approximately 1"
39"-52" gravelly sandy loam
52"-? sand gravel mix D_{50} estimated to be about 0.25"

In this pit the inflow rate of 11.9 gpm was maintained for 3.5 hours and at no time did water puddle in the bottom of the pipe. The infiltration rate is in excess of 3.8 gpm/sq. ft.

The area needed for infiltrating the water was determined assuming an infiltration rate for the entire area of 3.0 gpm/sq.ft./ per foot of head. For an inflow rate of 50 cfs the infiltration area needs to be 7480 square feet. The infiltration rate of 3.0 gpm/sq.ft. was chosen because the pits will be located in the area with soil surface texture similar to test pit #2.

Due to the possibility of fine soil particles plugging the infiltration area, unknowns concerning the long term infiltration rate and that the amount of water available is not yet known extra infiltration area is being provided. Three separate pits with bottom dimensions of 50 feet X 100 feet are proposed. This will provide an infiltration area of 15,000 square feet.

The pits will be excavated to a depth of about 5 feet to get below the second sandy loam layer noted in both test pits. This will allow the water depth to be 2.5 feet - 3.5 feet. That will increase the rate of infiltration over the test values derived with one foot of water depth. The overall safety factor for the infiltration area is well over 2.

Inflow to the system will be measured with a ramp flume and continuously recorded. The ramp flume is sized to provide 5% flow rate accuracy over a flow range of 10 cfs-50 cfs

Any outflow from the last pit will be safely returned to the White Ditch through a 12-inch pipe. The pipe will be on a slope that will keep water from flowing out of White Ditch.

By: Bernard J. Hewes Date: 8/21/03
Bernard J. Hewes

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

Attachment 3A

LAND USE INFORMATION SHEET

This information is needed to determine if the proposed project complies with statewide planning goals and is compatible with local comprehensive plans (ORS 192.180)

CITY/COUNTY LAND USE INFORMATION (to be completed by local planning official):

Please check below the one that applies! Recharge - Hudson Bay project

☐ This project is not regulated by the local comprehensive plan and zoning ordinance.

☒ This project has been reviewed and is compatible with the local comprehensive zoning ordinance. (Please cite appropriate plan policies, ordinance section, and case numbers.) 152.056

☐ This project has been reviewed and is not compatible with the local comprehensive plan and zoning ordinance. (Cite appropriate plan policies, ordinance section, and case numbers).

☐ Compatibility of this project with the local planning ordinance cannot be determined until the following local approvals are obtained:

_____ Conditional Use Permit
_____ Plan Amendment
_____ Other
_____ Development Permit
_____ Zone Change

An application has ___ has not ___ been made for the local approvals checked above.

* Signature of Local Official: Patty Perry

Title: Senior Planner Date: 5-27-03

Must be authorized signature from your local City/County Planning Department

ATTACHMENT 5A: Methodology to Determine Chemical Constituents for Water Quality Assessment and Evaluation

Introduction:

The Artificial Groundwater Recharge rules (OAR 690-350-120) require both up front water quality and a water quality-monitoring plan. Further, for any recharge project the rules (OAR 690-350-120 (3) (b) require an applicant to either obtain a water quality permit (typically a water pollution control facility (WPCF) permit) or show that a permit is not necessary. Also, rules OAR 690-350-120 (3)(g) require a "Project Description Report" (ATTACHMENT 5) that outlines the proposed groundwater quality-monitoring plan. This attachment is intended to specifically help clarify the method by which the list of chemical constituents was determined.

Project Area Sample Chemical Review Methodology

Working with Tom Darnell, OSU Extension agent in Milton-Freewater, a chemical constituents review was conducted in order to determine what types of chemicals should be examined in the surface and groundwater monitoring for the project. Several steps were followed to determine which chemicals were of interest.

Review Steps

1. Reviewed the ODEO Report: *April 1999 Milton-Freewater Groundwater Quality Study: As part of the Statewide Groundwater Monitoring Program* (Richardson, et. al., 2000). Particular attention was focused on the constituents tested, testing protocol and timing, and the results-conclusions.
2. Reviewed *OSU Extension Pesticide Properties Database* and determined which were used in the Milton-Freewater area and a list was comprised. (Table 4A1, 4A2)
3. Determined which were currently and/or historically used in the area utilizing past chemical studies in the basin (see references). This included interviewing the current landowner on the site-specific history of chemical use on that property (see signed written statement below).
4. Determined which chemicals were important to monitor for during the recharge period (winter-spring). Considered each chemical's typical seasonal application period, solubility in water, soil half-life, and soil movement ratings.
5. Considered project design (top soil removed), and finalized list of chemicals of interest.

Final List of Chemicals to Monitor for Recharge Project

Chemicals Currently Used:

Rubigan (Fenarimol)
Ridomil (Metalxyl)
Systhane/Rally (Myclobutanil)
Devrinol (Napropamide)

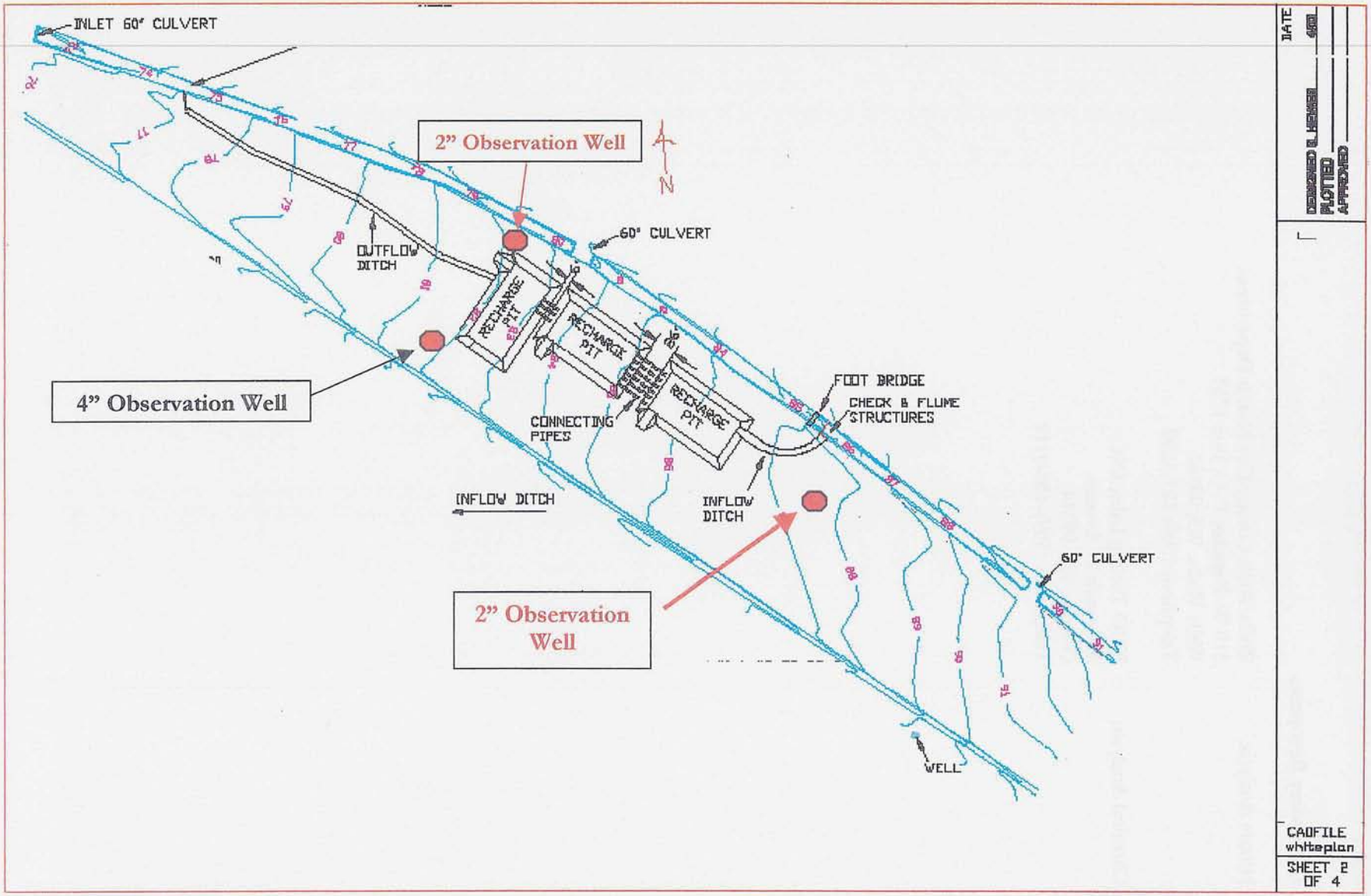
Chemicals Historically Used:

DDD-DDE-DDT
Elgetol (DNOC sodium salt)
Alar/B-Nine (Daminozide)
Lindane (Lindane)

Laboratory Resources

Nitrate Analysis:	Walla Walla County-City Health Department 310 W. Popular, P. O. Box 1753 Walla Walla, WA 99362 Telephone (509) 527-3290
Chemical Analysis:	KUO Testing Labs, INC. 337 south 1st Avenue Othello, WA 99344 Telephone: (509)-488-0118

Attachment 5B Map of On-Site Monitoring Well Locations



Attachment 5D

History of Chemical[1] Use: Recharge Site Specific

Landowner Statement of Past Use:

"Gentleman.

I have been the owner of a certain parcel of land in the valley with an address known as 84140 Prunedale Rd., Milton-Freewater, Oregon, 97862.

I have owned this land since 1978 at which time we took over the existing orchard of apples and farmed it for two years at which time we began removing various blocks of tress and replanting with new varieties. In the past few years we raised Nursery Tree Stock and began leveling the land to its present condition, letting it lay in a dormant stage for a year and then planting cover crops to enrich the soil for a future cherry orchard.

The pesticides applications were the normal tree fruit pesticides as allowed by regulations of the industry. The herbicide applications were Round-Up, Simizine and Paraquat. No other chemicals were used on this parcel of land during my ownership. If you should have other questions, please contact me at the following: (541)-278-6305, (509)-386-6175, or (541)-558-3752 or email at:
Hjohnson@co.umatilla.or.us"

Landowner: _____ Date: 10-17-03

[1] Chemical is defined here to include insecticides, fertilizers, herbicides, rodenticides, fungicides, and all other non-natural chemicals.

ATTACHMENT 7A: Source Water Quality Data

1STORET RETRIEVAL DATE 99/06/23
402388 28AWALL03780
46 01 08.6 118 24 45.1 4
WALLA WALLA RIVER AT HWY 11 (MILTON-FREEWATER)
41059 OREGON UMATILLA
PACIFIC NORTHWEST 131007
COLUMBIA RIVER BASIN BELOW YAKIMA RIVER
21400000 17070102007 00
0000 FEET DEPTH

Grey areas samples that correspond to Recharge Project

INITIAL DATE	67/04/24	67/08/21	67/12/11	68/04/02	68/08/05	68/12/16	69/03/04	69/12/10	70/04/28
INITIAL TIME	1235	1400	1440	1615	1750	1100	1510	1145	930
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	8	25.5	7	8.5	25	5	8.6	5	6
00011 WATER TEMP FAHN	46.4$	77.9$	44.6$	47.3$	77.0$	41.0$	47.5$	41.0$	42.8$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU	250	2		10	3	8		7	1
00080 COLOR PT-CO UNITS	20	4		3	5	3		1	3
00095 CNDUCTVY AT 25C MICROMHO	67	225	200	72	243	69	95		71
00300 DO MG/L	10.3	12.2	10.6	11.4	10.7	12.2	11.6	11.7	12.7
00301 DO SATUR PERCENT	89	150	89	99	131	95	99	94	105
00310 BOD 5 DAY MG/L	0.7	1.3	0.9	0.5	1.3	1.6	0.8	1.5	1.5
00400 PH SU	7.3	8.3	7.7	7.5	8.40L	7.2	7.6	7.5	7.5
00410 T ALK CACO3 MG/L	30	108		33	105	30		54	31
00500 RESIDUE TOTAL MG/L	518			99	184	101		118	87
00530 RESIDUE TOT NFLT MG/L	368	11		10	10	21		18	12
00610 NH3+NH4- N TOTAL MG/L	0.13	0.34		0.38	0.32	0.17		0.08	0.12
00612 UN-IONZD NH3-N MG/L	.0004$	.036$		.002$	.040$	.0003$		.0003$	.0005$
00619 UN-IONZD NH3-NH3 MG/L	.0005$	.043$		.002$	.049$	.0004$		.0004$	.0006$
00620 NO3-N TOTAL MG/L	0.03	0.02		0.07	0.38	0.54		0.73	0.13
00660 ORTHOPO4 PO4 MG/L	0.06	0.16		0.1	0.18	0.56		0.16	0.03
00760 SWL PBI MG/L	1K	1K	29	1K					
00940 CHLORIDE TOTAL MG/L	2			1	8	2		2	1
00945 SULFATE SO4-TOT MG/L	8	33		4	14	4		6	3
22413 HARDNESS TOTLDISS WTR MG/L	28			37	99	35		49	24
31505 TOT COLI MPN CONF /100ML	620	2400	7000	60	230	2300	620	450K	620
31615 FEC COLI MPNECMED /100ML			230						60
31677 FECSTREP MPNADEVA /100ML								240	

ATTACHMENT 7A: Source Water Quality Data

INITIAL DATE	70/07/13	70/11/30	71/05/11	71/08/16	72/02/28	72/08/30	73/02/12	73/06/13	73/09/24
INITIAL TIME	1400	1645	2000	1620	1610	1130	845	1055	1400
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	24	5.5	15.5	26	9	20.5	2.5	16.5	16
00011 WATER TEMP FAHN	75.2$	41.9$	59.9$	78.8$	48.2$	68.9$	36.5$	61.7$	60.8$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU		5	3	1	28	2	15	3	2
00080 COLOR PT-CO UNITS		0	1	2	10	5	5	5	0
00094 CNDUCTVY FIELD MICROMHO							90		
(SAMPLE CONTINUED FROM PREVIOUS PAGE)									

INITIAL DATE	70/07/13	70/11/30	71/05/11	71/08/16	72/02/28	72/08/30	73/02/12	73/06/13	73/09/24
INITIAL TIME	1400	1645	2000	1620	1610	1130	845	1055	1400
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00095 CNDUCTVY AT 25C MICROMHO	236	66	51	200	67	221	87		
00300 DO MG/L	12.5	11.5	9.5	14.2	11	12.5	12.9	11.7	11.5
00301 DO SATUR PERCENT	151	95	99	172	97	137	97	117.0$	115.0$
00310 BOD 5 DAY MG/L	2	0.7	0.8	2.3	0.7	0.9	1.4		
00400 PH SU	8.6	7.5	7.3	8.9	7.1	8.4	7.3		
00410 T ALK CACO3 MG/L		29	21	96	23	92	29	82	95
00500 RESIDUE TOTAL MG/L		89	75	172	280	170	100	153	164
00530 RESIDUE TOT NFLT MG/L		12	12	4	106	8	32	10	3
00610 NH3+NH4- N TOTAL MG/L		0.34	0.06	0.66	0.09	0.14	0.04	0.1	0.17
00612 UN-IONZD NH3-N MG/L		.001$	.0003$	.215$	.0002$	.013$	.00008$		
00619 UN-IONZD NH3-NH3 MG/L		.002$	.0004$	.261$	.0002$	.016$	.00010$		
00620 NO3-N TOTAL MG/L		0.02	0.1	0.15	0.3	0.51	0.14	0.36	0.39
00625 TOT KJEL N MG/L							0.2		
00650 T PO4 PO4 MG/L							0.3		
00660 ORTHOPO4 PO4 MG/L		0.06	0.09	0.13	0.09	0.04	0.09	0.1	0.14
00930 SODIUM NA,DISS MG/L					2.4		2.8		
00935 PTSSIUM K,DISS MG/L					2		1.5		
00940 CHLORIDE TOTAL MG/L		1	0.7	5	0.8	3	1	6	4
00945 SULFATE SO4-TOT MG/L		3	.1K	11	3	11	2	6	4
22413 HARDNESS TOTLDISS WTR MG/L		26	19	80	22	84	28	71	79
31505 TOT COLI MPN CONF /100ML	230	2400	2400	230	620	620	290		
31615 FEC COLI MPNECMED /100ML	230	45K	45K	45K	45K		60		

ATTACHMENT 7A: Source Water Quality Data

INITIAL DATE	74/05/06	74/07/30	74/11/11	75/05/27	75/07/08	75/11/10
INITIAL TIME	1450	1710	1610	1945	1640	1715
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	12.5	27.5		11	28	7
00011 WATER TEMP FAHN	54.5$	81.5$		51.8$	82.4$	44.6$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10
00070 TURB JKSN JTU	35	4	12	2	2	1
00080 COLOR PT-CO UNITS	10	5	10	5	15	2
00094 CNDUCTVY FIELD MICROMHO	55	190			180	120
00095 CNDUCTVY AT 25C MICROMHO	60	220		61	201	112
00300 DO MG/L	10.5	9.6		10.2	10.3	11.1
00301 DO SATUR PERCENT	100	136		95	126	93
00310 BOD 5 DAY MG/L	0.9	1.5		0.3	1.8	0.2
00400 PH SU	7.5	8.4		7.3	8.4	8
00410 T ALK CACO3 MG/L	19	77	52	25	69	48
(SAMPLE CONTINUED FROM PREVIOUS PAGE)						
INITIAL DATE	74/05/06	74/07/30	74/11/11	75/05/27	75/07/08	75/11/10
INITIAL TIME	1450	1710	1610	1945	1640	1715
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER
00500 RESIDUE TOTAL MG/L	251	159	132	70	180	114
00530 RESIDUE TOT NFLT MG/L	205	12	22	7	44	5
00610 NH3+NH4- N TOTAL MG/L	.010K	0.02	0.06	.010K	0.09	0.02
00612 UN-IONZD NH3-N MG/L	.00007$	.003$		.00004$	.013$	.0003$
00619 UN-IONZD NH3-NH3 MG/L	.00009$	.004$		.00005$	.016$	.0004$
00620 NO3-N TOTAL MG/L	0.11	0.29	0.3	0.14	0.69	0.4
00650 T PO4 PO4 MG/L	0.5	0.2		0.3	0.5	0.1
00660 ORTHOPO4 PO4 MG/L	0.04	0.13	0.11	0.11	0.1	0.12
00930 SODIUM NA,DISS MG/L	2.2	8		2.7	8.9	4.6
00935 PTSSIUM K,DISS MG/L	1.6	4		1.6	3.1	2.8
00940 CHLORIDE TOTAL MG/L	0.4	3	2	2	4	2
00945 SULFATE SO4-TOT MG/L	1	6	6	2	8	4
22413 HARDNESS TOTLDISS WTR MG/L	16	69	48	20	63	40
31505 TOT COLI MPN CONF /100ML	230	620		620	2400	230
31615 FEC COLI MPNECMED /100ML	230	620		45	2400	60

ATTACHMENT 7A: Source Water Quality Data

1STORET RETRIEVAL DATE 99/06/23
402389 28AWALL04860
45 54 13.6 118 22 02.9 4
WALLA WALLA RIVER U/S MILTON-FREEWATER
41059 OREGON UMATILLA
PACIFIC NORTHWEST 131007
COLUMBIA RIVER BASIN BELOW YAKIMA RIVER
21400000 17070102011 00
0000 FEET DEPTH

INITIAL DATE	67/04/24	67/08/21	67/12/11	68/04/03	68/08/06	68/12/16	69/03/04	69/12/10
INITIAL TIME	1300	1520	1700	810	905	1030	1540	1055
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	6	21	5	6.5	16	5	6.4	3
00011 WATER TEMP FAHN	42.8$	69.8$	41.0$	43.7$	60.8$	41.0$	43.5$	37.4$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU	5	7	15	2	5	9	12	2
00080 COLOR PT-CO UNITS	6	2	4	4	4	3	2	0
00095 CNDUCTVY AT 25C MICROMHO	59	180	69	57	93	57	63	
00300 DO MG/L	11.2	8.7	11.9	11.6	9.7	11.1	11.6	12.9
00301 DO SATUR PERCENT	94	101	98	98	102	87	99	100
00310 BOD 5 DAY MG/L	0.6	0.8	1.1	0.6	0.4	0.2	0.7	1.2
00400 PH SU	7.4	7.5	7.5	7.3	7.3	7	7.5	7.7
00410 T ALK CACO3 MG/L	26	32	32	26	40	16	27	33
00500 RESIDUE TOTAL MG/L	89	101	83	113	98	92	81	67
00530 RESIDUE TOT NFLT MG/L	2	8	6	7	22	26	7	6
00610 NH3+NH4- N TOTAL MG/L	0.14	0.17	0.32	0.12	0.18	0.11	0.06	0.03
00612 UN-IONZD NH3-N MG/L	.0005$	.002$	.001$	.0003$	.001$	.0001$	.0003$	.0002$
00619 UN-IONZD NH3-NH3 MG/L	.0006$	.003$	.002$	.0004$	.001$	.0002$	.0003$	.0002$
00620 NO3-N TOTAL MG/L	0.01	0.02	0.02	0.03	0.04	0.39	0.3	0.12
00660 ORTHOPO4 PO4 MG/L	0.02	0.1	0.1	0.07	.01K	0.01	0.11	0.1
00760 SWL PBI MG/L	8	1K	1					
00940 CHLORIDE TOTAL MG/L	1	5	1	1	6	2	2	0.8
00945 SULFATE SO4-TOT MG/L	3	0.6	4	2	15	3	1	3
22413 HARDNESS TOTLDISS WTR MG/L	23	36	29	24	32	25	26	31
31505 TOT COLI MPN CONF /100ML	230	620	210	230	620	210	60	60
31615 FEC COLI MPNECMED /100ML			210					
31677 FECSTREP MPNADEVA /100ML								5K

ATTACHMENT 7A: Source Water Quality Data

INITIAL DATE	70/07/13	70/11/30	71/05/11	71/08/16	72/02/28	72/08/30	73/02/11	73/06/13
INITIAL TIME	1445	1615	1930	1655	1550	1110	1730	1025
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00010 WATER TEMP CENT	19.5	5	15.5	19	7.5	15.5	4	12.5
00011 WATER TEMP FAHN	67.1$	41.0$	59.9$	66.2$	45.5$	59.9$	39.2$	54.5$
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	10	10
00070 TURB JKSN JTU	1	3	5	1	10	1	5	1
00080 COLOR PT-CO UNITS	1	7	0	1	5	0	3	5
00094 CNDUCTVY FIELD MICROMHO							75	

INITIAL DATE	70/07/13	70/11/30	71/05/11	71/08/16	72/02/28	72/08/30	73/02/11	73/06/13
INITIAL TIME	1445	1615	1930	1655	1550	1110	1730	1025
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
00095 CNDUCTVY AT 25C MICROMHO	84	58	46	84	92	93	76	
00300 DO MG/L	9.8	11.5	9.9	9	11.3	9.9	12	10.7
00301 DO SATUR PERCENT	112	95	104	96	100	98	96	99.1$
00310 BOD 5 DAY MG/L	0.9	0.6	0.7	0.7	0.6	0.4	1.1	
00400 PH SU	8.1	7.5	7.3	7.6	7.1	7.6	7.3	
00410 T ALK CACO3 MG/L	35	26	19	38	21	36	26	34
00500 RESIDUE TOTAL MG/L	176	72	81	86	104	93	79	88
00530 RESIDUE TOT NFLT MG/L	6	4	8	3	13	4	8	6
00610 NH3+NH4- N TOTAL .MG/L	0.12	0.19	0.16	0.43	0.09	0.1	0.05	0.04
00612 UN-IONZD NH3-N MG/L	.006$	.0007$	.0009$	.006$	.0002$	.001$	.0001$	
00619 UN-IONZD NH3-NH3 MG/L	.007$	.0009$	.001$	.008$	.0002$	.001$	.0001$	
00620 NO3-N TOTAL MG/L	0.06	.010K	0.06	0.07	0.16	0.12	.030K	0.03
00625 TOT KJEL N MG/L							0.2	
00650 T PO4 PO4 MG/L							0.5	
00660 ORTHOPO4 PO4 MG/L	0.05	0.06	0.08	0.07	0.09	0.08	0.08	0.09
00930 SODIUM NA,DISS MG/L					2.1		2	
00935 PTSSIUM K,DISS MG/L					2		1.5	
00940 CHLORIDE TOTAL MG/L	3	1	1	0.9	0.6	1	0.3	3
00945 SULFATE SO4-TOT MG/L	2	1	.1K	0.5	2	2	0.9	0.8
22413 HARDNESS TOTLDISS WTR MG/L	270	22	18	40	19	32	23	26
31505 TOT COLI MPN CONF /100ML	620	2400	230	7000	130	620	620	
31615 FEC COLI MPNECMED /100ML	60	45K	60	60	45K		46	

ATTACHMENT 7A: Source Water Quality Data

INITIAL DATE	74/05/06	74/07/30	74/11/11	75/05/27	75/07/08	75/11/10	
INITIAL TIME	1420	1745	1630	1930	1745	1745	
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	
00010 WATER TEMP CENT	10.5	20.5		10.5	27	4.7	
00011 WATER TEMP FAHN	50.9$	68.9$		50.9$	80.6$	40.5$	
00027 COLLECT AGENCY CODE	10	10	10	10	10	10	
00070 TURB JKSN JTU	7	2	1	1	2	1.0K	
00080 COLOR PT-CO UNITS	5	5	1K	5	15	1K	
00094 CNDUCTVY FIELD MICROMHO	49	80		55	170	80	
00095 CNDUCTVY AT 25C MICROMHO	53	90		54	195	72	
00300 DO MG/L	10.8	9		10.8	8.7	11.9	
00301 DO SATUR PERCENT	101	103		102	106	95	
00310 BOD 5 DAY MG/L	1	0.3		0.6	3	0.4	
00400 PH SU	7.5	8		7.3	8	7.7	
00410 T ALK CACO3 MG/L	17	34	33	20	65	34	

INITIAL DATE	74/05/06	74/07/30	74/11/11	75/05/27	75/07/08	75/11/10	
INITIAL TIME	1420	1745	1630	1930	1745	1745	
MEDIUM	WATER	WATER	WATER	WATER	WATER	WATER	
00500 RESIDUE TOTAL MG/L	62	76	68	64	180	87	
00530 RESIDUE TOT NFLT MG/L	39	4	1K	5	38	3	
00610 NH3+NH4- N TOTAL MG/L	0.03	0.02	0.06	0.01	0.19	0.02	
00612 UN-IONZD NH3-N MG/L	.0002$	.0008$		.00004$	.012$	.0001$	
00619 UN-IONZD NH3-NH3 MG/L	.0002$	.0010$		.00005$	.014$	.0001$	
00620 NO3-N TOTAL MG/L	0.01	0.05	0.06	0.1	0.72	0.12	
00650 T PO4 PO4 MG/L	0.2	0.2		0.3	0.5	0.1	
00660 ORTHOPO4 PO4 MG/L	0.01	0.14	0.08	0.09	0.08	0.11	
00930 SODIUM NA,DISS MG/L	2.1	3		2.4	8.4	3	
00935 PTSSIUM K,DISS MG/L	1.6	2.4		1.3	3.5	2	
00940 CHLORIDE TOTAL MG/L	0.4	0.9	1	1	6	1	
00945 SULFATE SO4-TOT MG/L	2	1	2	2	8	2	
22413 HARDNESS TOTLDISS WTR MG/L	14	27	27	19	60	27	
31505 TOT COLI MPN CONF /100ML	60	7000L		230	7000	2400	
31615 FEC COLI MPNECMED /100ML	45K	620		45	7000	230	

Attachment 3B

LAND LEASE

1. PARTIES

The parties to this Lease are HULETTE M. JOHNSON, SHIRLEY A. JOHNSON, and H. MARC JOHNSON, hereinafter referred to as Landlord, and HUDSON BAY DISTRICT IMPROVEMENT COMPANY, and Oregon Non-profit Improvement District, hereinafter referred to as Tenant.

2. DATE

This Lease will begin the first of the following month, after the Tenant has obtained a water right certificate for the purpose of ground water recharge for this site from the State of Oregon.

3. DESCRIPTION OF LEASED PREMISES

Landlord leases to Tenant and Tenant leases from Landlord, under the terms and conditions stated herein, the real property in Umatilla County, State of Oregon, described in Exhibit "A" attached hereto and by such reference incorporated herein.

4. TERM OF LEASE

The term of this Lease will be from the date of this lease for a period of five(5) years. Tenant shall have the option to renew this lease with notice to Landlord of not less than 90 days prior to the end of the initial term and any renewal terms for future additional five year terms upon the mutual agreement of renegotiated rental terms for each renewal period.

5. POSSESSION

The Tenant shall be granted possession of the property upon execution of this document by all parties, together with the receipt of the initial lease payment as prescribed in RENT.

6. RENT

Tenant shall pay advance annual rent payments in the amount of three thousand six hundred dollars($3,600) plus annual assessment for irrigation water for surface water rights delivered by Tenant to 84140 Prunedale Road, beginning with INV # 1276C for 2003. Landlord shall pay same assessment to Tenant upon receipt of said annual assessment payment from Tenant. Tenant shall make each annual payment for the term of this lease to Landlords address, 52833 Sunquist Road, Milton-Freewater, Oregon, 97862, or otherwise as notified. The initial payment shall be due on the date this agreement is executed by Tenant and Landlord, and Tenant it therefore granted possession to said real property.

7. INSURANCE

Tenant shall maintain liability insurance on the leased property in an amount acceptable to the Landlord and shall provide proof of such insurance naming Landlords as additional insureds. Tenant shall also be responsible for necessary insurance on laborers. Tenant shall also be responsible for insurance coverage on personal property kept or installed upon this leased premises.

8. USE OF PREMISES

Tenant agrees that they will use the property for ground water recharge/storage, ponding.

9. LANDLORDS OBLIGATIONS

Landlord shall install electricity, pump, collection pond and mainline with the assistance of Tenant necessary to connect the source of irrigation water provided by Tenant to the existing delivery systems of Landlord's.

If there is a mortgage or other encumbrance on said premises, Landlord covenants to keep same in good standing, at all times, to make payments when due and not to suffer or permit default in said encumbrance.

Landlord shall pay all property taxes upon the real property subject to this lease in a timely manner.

10. TENANT'S OBLIGATIONS

Tenant shall provide all labor and materials for the construction of the ground water recharge pond, Landlord's irrigation collection pond and pumping station or other improvements required by Tenant, including maintenance of bridges and culverts.

Tenant shall pay all taxes of any kind and necessary insurance for labor to maintain to maintain improvements including any increase in property taxes as a result of said improvements as made by Tenant.

Tenant shall pay for all maintenance and operation of improvements constructed on said premises.

Tenant agrees that earth material excavated from the recharge pond shall be placed along the edges of the recharge area to produce a basin-like pond. Excess material shall be placed in other areas of Landlords property as directed by Landlord and spread evenly where located so that agricultural activities may continue.

Tenant upon termination of lease, shall replace all soil to a level topography using stored material from the sides of said 'recharge' pond, together with other off site soil as approved by Landlord, necessary to return the recharge pond to a level premise ~~for agricultural growing activities.~~

Tenant shall pay for all costs incurred for control of noxious weeds and vegetation around perimeter of ponding areas, and shall spray the perimeter of said pond including the banks of the Hudson Bay Canal and the Pleasantview Canal including bridges and culverts to maintain a clean ground cover as directed by Landlord

Tenant shall provide signage for trespass prevention and notice of man-made hazard upon premises at the commencement of work efforts at the recharge area.

Tenant shall install any and all fences and gates necessary as may be required by an insurance company or others around the recharge pond.

11. LIENS

Tenant shall pay, as due, all claims for work done on and for services rendered or materials furnished to the leased premises incurred and owing by Tenant and shall keep the premises free of any liens resulting from acts of the Tenant.

12. COVENANTS OF TITLE

Landlord covenants that he is the owner of the above described property free of any encumbrance that would impair or interfere with Tenant's rights under this Lease, and that Landlord has full right and authority to lease the premises described herein.

13. WASTE

Tenant shall not commit or permit to be committed any waste, strip, damage to or misuse of the premises.

14. INDEMNIFICATION

Tenant shall indemnify, hold harmless and defend Landlords from all claims, loss or liability arising out of or related to any activity of Tenant on the leased premises or any condition of the leased premises in the possession or under the control of the Tenant.

15. ASSIGNMENT

No part of the leased property may be assigned, mortgaged, or subleased, nor may a right of use of any portion of the property be conferred on any third person by any other means without the prior written consent of Landlord. This provision shall apply to all transfers to and by trustees in bankruptcy, receivers, administrators, executors, and legatees. No consent in one instance shall prevent the provision from applying to a subsequent instance.

16. DEFAULT

The following shall be events of default:

Failure to pay rent when due.

Failure of either Landlord or Tenant to comply with any other term or condition or fulfill any other obligation of this Lease within twenty(20) days after written notice by Landlord or Tenant specifying the nature of the default with reasonable particularity.

Abandonment by the Tenant of the property

If the default is of such a nature that it cannot be completely remedied within the twenty-day period and the defaulting party thereafter proceeds with reasonable diligence and in good faith to effect the remedy as soon as practicable, default shall not be declared unless the defaulting party ceases to effect the remedy.

17. TAXES

The Landlord shall pay all real property taxes for real property for the term of this Lease. Tenant shall be liable to pay any taxes, personal or real, incurred as a result of improvements placed upon the leased premises.

18. NONWAIVER

Waiver by either party of strict performance of any provision of this Lease shall not be a waiver of or prejudice the party's right to require strict performance of the same provision in the future or of any other provision of this Lease.

19. ATTORNEY FEES

If suit or action is instituted in connection with any controversy arising out of the Lease, the prevailing party shall be entitled to recover, in addition to costs, such sums as the Court may adjudge reasonable as attorney fees.

20. SUCCESSION

Subject to the above-stated limitations on transfer of Tenant's interest, this Lease shall be binding upon and inure to the benefit of the parties, their respective successors and assigns.

21. INSPECTION OF PREMISES

The Landlord reserves the right to themselves and their agents to go upon the premises at reasonable and proper times to inspect the same for the purpose of determining that the Lease is being properly observed and that all of the terms of this lease are being performed by the Tenant.

22. IMPROVEMENTS

Any improvements to the real property by Tenant shall remain the property of the Landlord upon termination of this Lease, unless the Tenant obtains the written consent of Landlord to remove said improvements prior to the time the improvements are placed on the property. However, Tenant shall be responsible for refilling the recharge "pond" as set forth in paragraph 10 above.

23. TERMINATION

The Tenant agrees to deliver the property to the Landlord at the end of the term of this Lease and in as good a condition as when accepted, and pursuant to paragraph 10 above.

24. TIME IS OF THE ESSENCE

The parties acknowledge and agree that time is of the essence with respect to all of the terms, conditions, and provisions of this Lease.

25. NOTICES

Any notice required or permitted under this Lease shall be given when actually delivered or when deposited in the United States Mail as certified mail, addressed as follows:

LANDLORD: HULETTE M. JOHNSON, et., al.
52833 Sunquist Road
Milton-Freewater, Oregon 97862

TENANT: HUDSON BAY DISTRICT IMPROVEMENT COMPANY
P.O. Box 110
Milton-Freewater, Oregon 97862

26. WATER DUES

The annual irrigation water dues as billed to Landlord by Tenant shall be paid by Landlord to Tenant as billed. As part of the rent agreement in paragraph 6 above, Tenant shall pay Landlord an equal amount of said water dues within thirty(30) days of receipt of said water dues from Landlord, during the term of this Lease and any renewals thereof.

27. CAPTIONS AND HEADINGS

The captions and headings throughout this Lease are for convenience and reference only and the words contained therein shall in no way be held or deemed to define, limit, describe, explain or modify the meaning of any provisions of or the scope or intent of this Lease.

28. ENTIRE AGREEMENT

This document is the entire, final, and complete agreement of the parties pertaining to the Lease of the premises described herein, and supersedes and replaces all written and oral agreements theretofore made or existing by and between the parties or their representatives in so far as the premises are concerned.

IN WITNESS WHEREOF, the parties have executed this Lease on the 15th day of October, 2003.

LANDLORD:

HULETTE M. JOHNSON,

SHIRLEY M. JOHNSON

H. MARC JOHNSON

TENANT:

HUDSON BAY IMPROVEMENT CO.

BY: John C Zerba

it's Secretary/Treasurer

STATE OF OREGON)
)ss.
County of Umatilla)

On this 15th day of Oct 2003 personally appeared before me the above named HULETTE M. JOHNSON, SHIRLEY M. JOHNSON, and H. MARC JOHNSON and acknowledged the foregoing to be a voluntary act and deed.

only if

OFFICIAL SEAL
KATHLEEN F. YENNEY
NOTARY PUBLIC-OREGON
COMMISSION NO. 337142
MY COMMISSION EXPIRES SEPT. 24, 2004

Kathleen F. Yenney
NOTARY PUBLIC FOR OREGON

My commission expires: 9-24-2004

STATE OF OREGON)
)ss.
County of Umatilla)

On this 15th day of Oct 2003, personally appeared before me the above named John C. Zerba, in his capacity as Secretary/Treasurer of HUDSON BAY IMPROVEMENT CO. and acknowledged the foregoing to be a voluntary act.

OFFICIAL SEAL
KATHLEEN F. YENNEY
NOTARY PUBLIC-OREGON
COMMISSION NO. 337142
MY COMMISSION EXPIRES SEPT. 24, 2004

Kathleen F. Yenney
NOTARY PUBLIC FOR OREGON
My Commission expires: 9-24-2004

R 42 PAGE 1265 Exhibit "A"

TRACT I:

Township 6 North, Range 35, East of the Willamette Meridian:
Section 33: A tract of land located in the South Half of the Northeast Quarter, and being a portion of that tract of land conveyed to William J. Jackson, by Deed recorded in Book 369, Page 267, Deed Records, and being described as follows, to-wit:

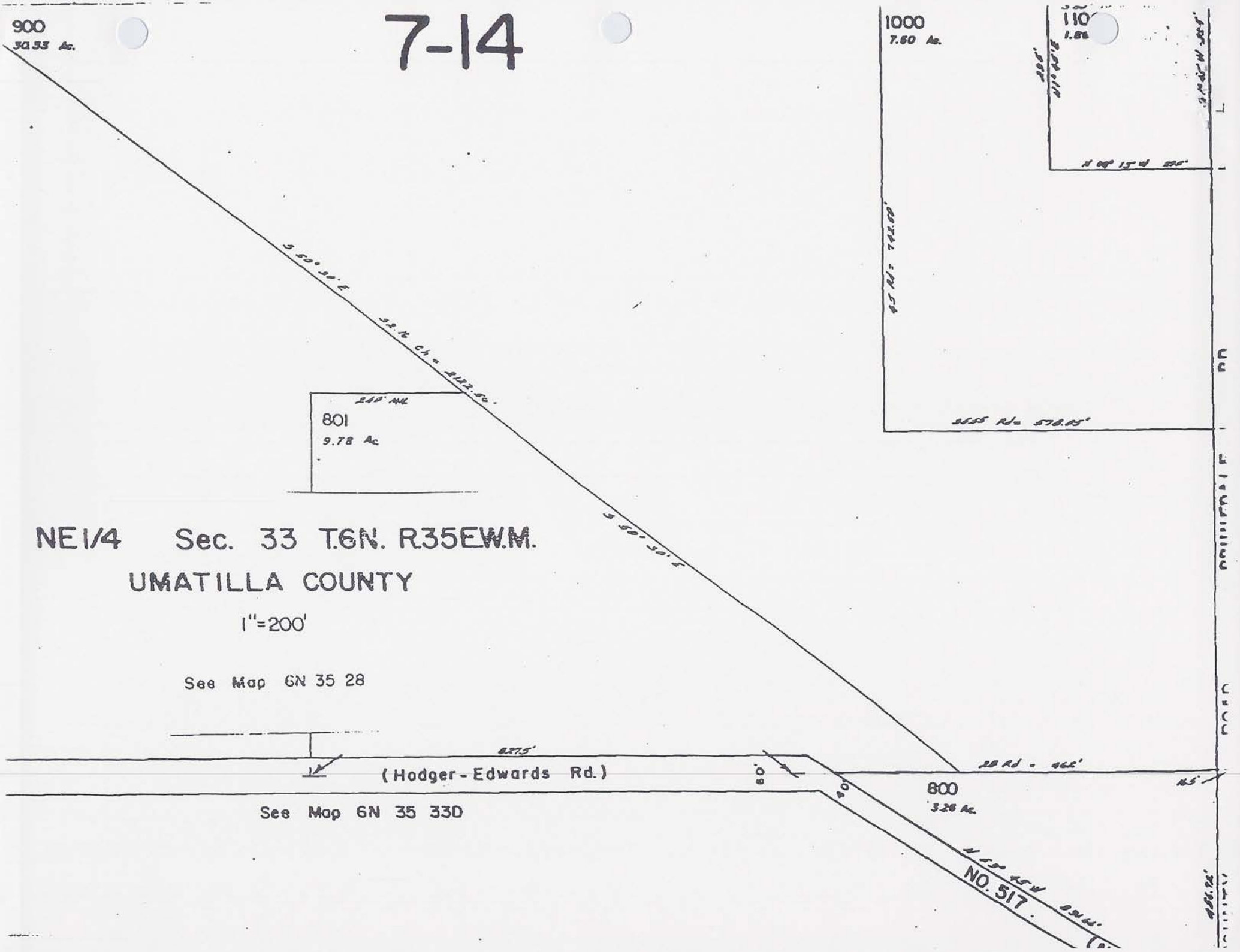
Commencing at the quarter section corner on the line between Sections 33 & 34; running thence North 20 chains: thence West 33-16/100 chains; thence Southeasterly 32-16/100 chains, more or less, to a point on the center line; running East and West through said Section 33, said point being 7 chains West of the point of beginning; thence East 7 chains to the point of beginning. Excepting Therefrom, beginning at the Northeast corner of the Southeast Quarter of the Northeast Quarter of said Section 33: and running thence South 45 rods: then West 35-5/9 rods; thence North 45 rods; thence East 33-5/9 rods to the place of beginning. All being East of the Willamette Meridian, Umatilla County, Oregon. Subject to any and all water rights of way and roads.

TRACT III:

Beginning at the Northeast corner of the Southeast Quarter of the Northeast Quarter of Section 33, Township 6 North, Range 35; running thence South 45 rods; thence West 35 and 5/9 rods; thence North 45 rods; thence East 35 and 5/9 rods to the place of beginning. Excepting therefrom that tract of land conveyed to the State of Oregon, by and through its State Highway Commission by deed recorded in Book 130, Page 573 of the Deed Records of Umatilla County, Oregon. Also, excepting any portion of said premises lying within that strip of land conveyed to Walla Walla and Columbia River Railroad Company, by deed recorded in Book "D", Page 834 of the said Deed Records. All being East of the Willamette Meridian, in the County of Umatilla and State of Oregon;

Excepting any and all water rights of way.

7-14


900
30.33 Ac.
1000
7.60 Ac.
110
1.85
801
9.78 Ac
S 50° 30' E
32.16 ch = 4122.50'
S 50° 30' E
NE1/4 Sec. 33 T.6N. R35E.W.M.
UMATILLA COUNTY
1"=200'
See Map 6N 35 28
(Hodger-Edwards Rd.)
See Map 6N 35 33D
800
3.26 Ac.
NO. 517

Attachment 8B

License No. _____

STATE OF OREGON

WATER RESOURCES DEPARTMENT

APPLICATION FOR LIMITED WATER USE LICENSE

Applicant(s): Hudson Bay District Irrigation Company

Contact Person: Jon Brough / John Zerba

Mailing Address: P.O. Box 110

Telephone No: 541 | 938-6105

I (We) make application for a Limited License to use or store the following described surface waters or groundwater-not otherwise exempt, or to use stored water of the State of Oregon for a use of a short-term or fixed duration:

1. **SOURCE(S) OF WATER for the proposed use:** Walla Walla River **a tributary of** Columbia River.

2. **TOTAL AMOUNT OF WATER to be diverted:** 50 **cubic feet per second, or** 50 **gallons per minute. If water is to be used from more than one source, give the quantity from each:** _____.

3. **INTENDED USE(S) OF WATER: (check all that apply)**
   - ☐ **Road construction or maintenance;**
   - ☐ **General construction;**
   - ☐ **Forestland and rangeland management; or**
   - ☒ **Other:** Artificial Ground water Recharge.

4. **DESCRIPTION OF PROPOSED PROJECT: Include a description of the intended place of use as shown on the accompanying site map, the method of water diversion, the type of equipment to be used (including pump horsepower, if applicable), length and dimensions of supply ditches and pipelines:** See attached Application document

5. **PROJECT SCHEDULE: (List day, month, and year)**
Date water use will begin 11-04
Date project will be completed 11-09
Date need for water will be completed 11-09

NOTE: A completed water availability statement from the local watermaster, fees and a site map meeting the requirements of OAR 690-340-030 must accompany this request. The fee for this request is $100 for the first point of diversion plus $10 for each additional point of diversion. The license, if granted, will not be issued or replaced by a new license for a period of more than five consecutive years. The right granted will be subordinate to all other authorized uses that rely upon the same source, or water affected by the source, and may be revoked at any time it is determined the use causes injury to any other water right or minimum perennial streamflow.

REMARKS:

SIGNATURE of Applicant: [signature] **DATE:** 10-23-03
Title: Sec - Pres

I certify that I have examined the foregoing application and accompanying data, and hereby grant a Limited License to use said water as described in the application, subject to all water rights of record, and subject to any valid public interest concerns which may become evident.

This license shall be in effect beginning _____, 20___, and shall expire _____, 20___.

WITNESS my hand this _____, 20___.

Paul R. Cleary
Water Resources Department
Director

The licensee shall give notice to the Department (Watermaster) at least 15 days in advance of using the water under the Limited License and shall maintain a record of use. The record of use shall include, but need not be limited to, an estimate of the amount of water used, the period of use and the categories of beneficial use to which the water is applied. During the period of the Limited License, the record of use shall be available for review by the Department upon request.

The application was first received at the Water Resources Department at Salem, Oregon, on the _____ day of _____, 20___, at _____ o'clock, ___M.

COPY

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3 July 2003

Mr. Bob Bower
Hydrologist
Walla Walla Basin Watershed Council
PO Box 68
Milton-Freewater, Oregon 97862

Subject: Test Site Hydrogeologic Assessment
Sediment Aquifer Study
K/J 026046.10

Dear Bob:

Kennedy/Jenks Consultants is pleased to present this letter report to the Walla Walla Basin Watershed Council (WWBWC). This letter report presents the results of a hydrogeologic assessment of the proposed shallow aquifer recharge test site (the test site) adjacent to the Hudson Bay Canal southeast of the WWBWC Office. This letter report was prepared as part of our letter contract with the WWBWC dated 13 February 2003 and amended 1 April 2003.

Introduction

The WWBWC is planning to sponsor a shallow aquifer recharge field test in the Walla Walla Basin (the Basin) just west of Milton-Freewater, Oregon. This letter report presents a preliminary hydrogeologic assessment of the proposed test site and the surrounding area. The area covered by this letter report includes an approximately 30 square mile area bounded on the north by the Washington/Oregon border, on the south by the base of the Horse Heaven Hills and Blue Mountains, to the east by a north-south line approximately 1 mile east of the Walla Walla River, and to the west by a north-south line through Umapine, Oregon (Attachment 1).

The proposed test site is located on approximately 9 acres adjacent to the south side of the Hudson Bay Canal (the Canal) in the east half of section 33, T6N, R35E (Attachment 1). This site is approximately 2 miles west of Milton-Freewater, Oregon, in Umatilla County. The test site was chosen because of its proximity to the Canal which will supply water for the test and the willingness of the land owner (Mr. H. Johnson) to allow construction of test infiltration ponds on the property.

The proposed test will be done with a facility consisting of three individual infiltration ponds lined up, one after the other, adjacent to the Canal. Approximately 50 cubic feet/second (cfs) of water will be available for diversion from the Canal into the upstream (easternmost) pond via a diversion structure. Water will then cascade from one pond to the next (from east to west) until it infiltrates out of the bottom of the pond(s). Any water escaping the final pond will be directed back into the Canal via a return pipe. In-flow from, and out-flow to, the Canal will be metered.

Testing is proposed for winter and early spring months when Walla Walla River flows (ultimate source of recharge water) are at their peak.

It is anticipated that recharge testing will be conducted under an ASR Limited License granted to the WWBWC by Oregon Department of Water Resources (OWRD) under OAR 690-350-0020. One of the requirements of the Limited License Application is to provide a supplemental preliminary hydrogeologic report describing groundwater conditions at the test site (OAR 690-350-0020 (3)(a)(b)(C)). This letter report, which is based predominantly on previously written reports and publicly available information, was written to meet this requirement.

This letter report focuses on suprabasalt sediments, the target for shallow aquifer recharge, and is subdivided into sections describing regional geology and hydrogeology, test site hydrogeology, surface water in the test site area (including springs), and groundwater and surface water quality. The assessment was done under the supervision of Mr. Terry Tolan, RG. The assessment is based largely on previously prepared and readily available reports and information. Attachments to this report include:

- Location map for the project area (Attachment 1)
- Structure contour and isopach maps for selected geologic units comprising the upper part of the shallow aquifer system (Attachments 2, 3, 4, and 5)
- A table summarizing geologic interpretations, well construction information, and water pumping data taken from water supply well logs used to assess area hydrogeology (Attachment 6)
- Draft test and monitoring plan (Attachment 7)

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Mann, G.M., and Meyer, C.E., 1993, Late Cenozoic structure and correlations to seismicity along the Olympic-Wallowa Lineament, northwest United States: Geological Society of America Bulletin, v. 105, no. 7, p. 853-871.

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Overview of the Test Site Area Geologic Setting

The most recent comprehensive geologic investigation of the suprabasalt sediments in the Basin, the strata which are the focus of this assessment, is Newcomb (1965). Our review of area geology is based on Newcomb (1965), more recent insights into area geology taken from reports describing regional suprabasalt sediment geology (Smith and others, 1989; Lindsey, 1996), and our ongoing work in the area on other projects. Since the emphasis of this hydrogeologic assessment is on the suprabasalt aquifer system, this section will focus primarily on the sedimentary strata and only briefly introduces the underlying Columbia River basalt.

Generally, suprabasalt sediments found in the Walla Walla Basin include (Figure 1):

- Holocene to Pliocene (?) alluvial gravel
- Pleistocene Cataclysmic Flood deposited sand and silt (Touchet Beds)
- Pleistocene loess (Palouse Formation)
- Miocene to Pliocene (?) conglomerate, sand, silt, and clay

Newcomb (1965) also described several terrace sequences within the Basin. These are not described in this letter report because they typically do not host aquifers. The basic physical characteristics and distribution of the uppermost 200 feet of the suprabasalt sediment sequence across the study area are briefly summarized in the following sections. We focus on the uppermost 200 feet of the suprabasalt sediment sequence because this is the stratigraphic interval that hosts the upper part of the shallow aquifer system, the primary target for proposed shallow aquifer recharge projects.

Holocene to Pliocene (?) Alluvial gravel

Basaltic, uncemented and nonindurated gravelly strata immediately underlies the groundsurface across much of the study area north of the base of the Horse heaven Hills. Based on the few outcrops of this unit described in reports (e.g., Newcomb, 1965), these strata are probably moderately to well bedded, have a silty to sandy matrix, and are generally uncemented. Our interpretation of borehole logs in the study area suggests the top of these strata appear to form a gently south-to-north dipping surface (Attachment 2). The alluvial gravel varies from absent to almost 120 feet-thick beneath the study area (Attachment 3). Many of the thicker accumulations of uncemented gravel appear to form elongate, linear tracts. Thickness variation in these strata

are inferred to be the result of paleodeposition in stream channels, syndeposition folding and faulting, and post-deposition erosion and deformation.

These uncemented gravels are generally equivalent to Newcomb's (1965) younger alluvial sand and gravel and referred to in the remainder of this letter report as alluvial gravel. The alluvial gravel is interpreted to record deposition of sand and gravel in the Walla Walla Basin by streams draining off the adjacent Blue Mountains and Horse Heaven Hills. These streams were probably the recent ancestors of many of the modern streams in the Basin, including the Walla Walla River, Mill Creek, Cottonwood Creek, Dry Creek, and Pine Creek. The distribution of the alluvial gravel, in large part, probably reflects the orientation of the streams in which these strata were deposited.

The age of the alluvial gravel is not well constrained. Depending on where one is at in the Basin, the alluvial gravel unit appears to predate, be contemporaneous with, and younger than the Palouse Formation and Touchet Beds. If this is the case, the alluvial gravel may be late Pliocene to Holocene in age (e.g., greater than 2 million years to less than a few thousand or even hundreds of years old).

Pleistocene Cataclysmic Flood Deposits (Touchet Beds)

During the Pleistocene, Cataclysmic Floods (e.g., Missoula or Bretz Floods) periodically inundated the Walla Walla valley between approximately 1,000,000 and 12,000 years ago (Waitt and others, 1994). Sand and silt deposited in the Walla Walla Basin by these flood waters consist of well stratified, normally graded, interbedded felsic silt and felsic to basaltic fine to medium sand (Figure 2). Finer grained layers tend to be brown to tan colored, coarser layers brown to gray-brown colored. Individual beds (or layers) range from a few inches to less than 3 feet-thick. These strata do not commonly display significant cementing, although some pedogenic calcium carbonate (caliche or hardpan) is commonly observed in the upper parts of these deposits where they are exposed at the Earth's surface. A range of soft-sediment deformation features and cross-cutting clastic dikes are commonly found in this unit (Fecht and others, 1999).

These Cataclysmic Flood deposits, also known as Touchet Beds, form most of the small hills located across the Walla Walla valley floor and along the base of the Blue Mountains (Attachment 4) to an elevation of approximately 1100 feet above mean sea level (msl).

Pleistocene loess (Palouse Formation)

Massive to poorly stratified silt and very fine sand deposits that display evidence of pedogenic (soil forming) modification is found on the hills surrounding the Basin (Figure 3). Pedogenic calcium carbonate may also be found in these deposits which are thought to be eolian (wind-deposited) loess, also referred to as the Palouse Formation (Busacca and others, 2002). These loess deposits are thought to range from greater than 1 million years old to less than 10,000 year old, making it older than, and age-equivalent to, the Touchet Beds (Busacca and others, 2002).

The Palouse Formation may be present in the western to central parts of the study area and intercalated within Touchet Beds. However, we suspect loess is rare to absent in this area because of a lack of loess outcrops. The Palouse Formation does crop out on the highlands bordering the southern and eastern edge of the Basin. Some of the strata mapped on Attachment 4 may be part of the Palouse Formation, but it was not differentiated from the Touchet Beds because of a lack of borehole log information.

Mio-Pliocene strata

Variably indurated conglomerate, sand, silt, and clay is found in the subsurface beneath the Walla Walla Basin. Based on limited outcrop descriptions, field reconnaissance, and borehole log descriptions these indurated gravel and sand, may locally have a caliche cap, and is they predominantly are basaltic in composition (Figure 4). Based on drill cuttings collected from wells recently drilled near Milton-Freewater, Oregon, these strata may also contain some mica and quartz. These indurated gravelly strata (conglomerate) are continuous beneath the entire study area (Attachment 5), range between approximately 75 and 250 feet-thick, and are referred to as the Mio-Pliocene conglomerate. It is differentiated from younger alluvial gravel unit by its physical characteristics, including a greater degree of induration, cement, and weathering.

The Mio-Pliocene conglomerate, sand, silt, and clay are generally equivalent to Newcomb's (1965) old gravel unit and old clay units. Newcomb (1965) placed the old gravel unit stratigraphically above the old clay unit. However, review of driller's logs across the study area reveal: (1) the presence of interstratified silt and gravel lithologies throughout entire thickness of the Mio-Pliocene strata, (2) areas where strata correlative to one of the two units, old gravel and old clay, are absent, and/or (3) areas where the inferred contact between the old gravel and clay units varies greatly in depth over distances of less than one mile. Given this, it is likely that the top of the old clay unit and bottom of the old gravel unit is not a single, continuous surface as suggested by Newcomb (1965). It is more likely that these strata interfinger and that a distinctive old gravel unit and old clay unit can not always be differentiated.

The mixed conglomerate, sand, silt, and clay forming the Mio-Pliocene unit are assigned a Miocene to Pliocene age (approximately 10 to 2 million years old) based on degree of induration, evidence of greater weathering, and stratigraphic position. To our knowledge no absolute age dates are available for this unit. Mio-Pliocene deposits of the Walla Walla Basin probably record deposition by the ancestral Salmon/Clearwater/Snake and Walla Walla River systems and include river channel deposits, overbank and flood plain deposits, and lake deposits. The distribution of coarse channel deposits in this unit should reflect the orientation of the ancient streams in which these materials were deposited.

Columbia River Basalt Group

The basalt flows that crop out on the highland bordering the Basin and that underlie the sediment sequence in the Basin belong to the Miocene Columbia River Basalt Group. The top of the Columbia River basalt surface is generally found to lie at lower elevations from the south (where it crops out on the steep hillsides south and west of Milton Freewater at elevations of

850 feet and above) to the north beneath the suprabasalt sediment filling the Basin. Abrupt elevation changes in the top of basalt near the Basin edge are interpreted to reflect the presence of faults offsetting this surface. Because of the depth at which this unit is generally found within the study area, it is assumed for the purposes of this assessment that it is likely that the Columbia River basalt does not exert a significant influence over the hydrogeologic behavior of the shallow suprabasalt sediment aquifer system in the immediate area of the test site.

Structural Geology

The Walla Walla Basin is a structural basin that began to develop during Miocene time (approximately 16 million years ago) and has continued to develop to the present day (Kienle, 1980; USDOE, 1988). The Basin is bounded on the south by the Horse Heaven Hills, the east by the Blue Mountains, and to the north by the Palouse Slope. The southern and eastern edges of the Basin are fault controlled. The uppermost basalt which crops out around the edge of the Basin on the Horse Heaven Hills and Blue Mountains is down dropped at these bounding faults. The faults, and associated folds, found on the southern and eastern edge of the Basin probably extends into the subsurface beneath the Basin (Kienle, 1980; Swanson and others, 1981). The presence of these faults beneath the Basin are inferred to, in part, explain discontinuities seen in the distribution of suprabasalt sediments, especially Mio-Pliocene sedimentary strata, and the top of basalt.

Overview of the Study Area Hydrogeologic Setting

Groundwater in the Walla Walla Basin is found in two primary aquifer systems: (1) the suprabasalt sediment aquifer system which is primarily hosted by Mio-Pliocene conglomerate and to a lesser extent, the overlying alluvial gravel (2) the underlying Columbia River basalt aquifer system. The suprabasalt aquifer, which is the target for shallow aquifer recharge, is the focus of this section.

Physical properties

The majority of the suprabasalt aquifer is hosted by Mio-Pliocene conglomerate unit while the uppermost part of the aquifer is found, at least locally, in the younger alluvial gravel unit. The suprabasalt aquifer is generally characterized as unconfined, but it does, at least locally, display confined conditions. Variation between confined and unconfined conditions within the aquifer system is probably controlled by sediment lithology (e.g., facies – coarse versus fine) and induration (e.g., cementation, compaction). Groundwater movement into, and through, the suprabasalt aquifer also is inferred to be controlled by sediment lithology (e.g., facies - coarse versus fine) and induration (e.g., cementation, compaction).

Given the physical properties of the alluvial gravel (non-indurated sand and gravel) versus those of the Mio-Pliocene conglomerate (e.g., finer matrix and the presence of naturally occurring cement), Mio-Pliocene conglomerate probably has generally lower permeability and porosity than the alluvial gravel. Consequently, suprabasalt aquifer groundwater flow velocities are inferred to be less where the water table lies within the Mio-Pliocene conglomerate than where it

lies within the younger, more permeable alluvial gravel. In addition, where the alluvial gravel is saturated, this uncemented, high permeability gravel and sand could form preferred pathways for groundwater movement and areas of increased infiltration capacity in the shallow parts of the suprabasalt aquifer system.

Very little hydraulic property information is available for the suprabasalt aquifer. Newcomb (1965) reports average effective porosity of 5 percent in the old gravel (e.g., the Mio-Pliocene conglomerate and sand). Given the physical characteristics of the overlying alluvial gravel, we suspect average effective porosity in it is higher. Modeling work by Barker and MacNish (1976) report estimated hydraulic conductivity and transmissivity of 1.5×10^{-4} feet/second to 7.6×10^{-3} feet/second and 10,000 feet^2/day to 60,000 feet^2/day, respectively, for the entire shallow aquifer. As with Newcomb's (1965) effective porosity estimate, we suspect hydraulic conductivity and transmissivity would be higher in saturated alluvial gravel than in saturated Mio-Pliocene conglomerate.

Groundwater level and flow direction

In the study, groundwater flow in the suprabasalt aquifer area is generally thought to be from south to north and northwest. There probably also is a component of groundwater movement towards the Walla Walla River where the suprabasalt water table near it is higher than the river. Where this occurs, the Walla Walla River is, in part, feed by groundwater discharge. However, along the course of the Walla Walla River through the study area, the suprabasalt water table may at least locally be below the bed of the river during much of the year. This is thought to be common between Milton-Freewater and the Stateline. When and where this occurs, such reaches of the river probably lose water to the suprabasalt aquifer.

WWBWC staff are collecting suprabasalt aquifer water level data from water supply wells located within the Basin between the Walla Walla River and Umapine. Water level data reported on well logs, and the few reports written for the Basin, suggest groundwater levels near the Walla Walla River (and many of the spring creeks) historically were relatively shallow, commonly less than 5 feet deep. With increased groundwater use over the past 20 years these water levels have generally declined, at least locally. This groundwater level decline is thought to account for, at least in part, the reduction in spring creek flow reported by many land owners in the Basin. Based on WWBWC water level data, the depth to suprabasalt aquifer groundwater ranges from 30 to 40 feet near Milton-Freewater, 3 to 10 feet along the Walla Walla River north of Milton-Freewater, 1 to 10 feet along the East and West Prongs of the Little Walla Walla, and 30 to 50 feet in the Umapine Area.

Aquifer recharge

Natural recharge to the suprabasalt aquifer is described by Newcomb (1965) to be from infiltration of surface water into the ground near the edge of the Basin where streams leave the adjacent basalt highlands and flow out onto the basin floor. The majority of this recharge probably occurs in the spring when streams flowing into the Basin reach peak discharges. Precipitation on parts of the Basin floor where the alluvial gravel and older, Mio-Pliocene strata lie at, or near, the surface also provides some natural recharge. With flood control and

channelization of the Walla Walla River and smaller streams, natural recharge via infiltration from surface waters has probably decreased with continued development.

Artificial recharge of the suprabasalt aquifer has become an important component of the hydrologic system since the 1920's and 1930's. This recharge is thought to have historically contributed water to at least some shallow water wells and springs (Newcomb, 1965). Artificial recharge probably occurs through irrigation ditch leakage and infiltration past the root zone in irrigated fields. With the advent of ditch/channel lining and reduction in the practice of flood irrigation, this type of recharge has probably decreased.

Reduced natural and artificial recharge will, and probably does, at least in part account for decreased suprabasalt water table levels. These reduced levels probably account for reduced spring flows and base level discharge to the Walla Walla River. The objective of the proposed SASR project is to attempt to locally replenish groundwater in the suprabasalt aquifer and restore some spring flows and Walla Walla River baseflow.

Water Quality

The most up-to-date groundwater quality data for the study area is found in Richerson and Cole (2000), an Oregon Department of Environmental Quality (ODEQ) report prepared for the northern portion of Umatilla County between Milton-Freewater and the Stateline. Two water quality parameters presented in the ODEQ report suggest groundwater quality in the uppermost suprabasalt aquifer in the area is relatively good with regard to ODEQ standards. These parameters, total dissolved solids (TDS) and nitrate-N, range from 150 to 250 mg/l and 0.5 to 4.5 mg/l, respectively on the Oregon side of the Stateline. Concentrations of these parameters generally decrease from north to south toward where the Walla Walla River enters the valley. This trend suggests the introduction of low nitrate-N and TDS surface water into the groundwater system and supports Newcomb's (1965) conclusion that a significant amount of surface water recharge of shallow groundwater occurs where the Walla Walla River enters the Basin. The increase in TDS and nitrate-N concentrations as suprabasalt groundwater moves north into the Basin is inferred to be, at least in part, the result of the relative increase in recharge from irrigation water reaching the suprabasalt aquifer.

Test Site Hydrogeology

Geologic features control the physical characteristics of aquifer hosting materials, and therefore the distribution and movement of groundwater through an aquifer. Understanding the nature and occurrence of these features both regionally and locally provide constraints on testing, data interpretation, monitoring, mitigation, and final design. This section describes the basic hydrogeology in the immediate vicinity of the test site.

Information reviewed for this assessment report is interpreted to indicate that the uppermost 200 feet of the suprabasalt sediment sequence underlying the test site consists predominantly of gravelly strata assigned to the Mio-Pliocene conglomerate (Figure 5). Specific unit thicknesses and distribution in the immediate vicinity of the test site are as follows:

- Touchet Beds are thin to non-existent, being absent at, north, and east of the test site. A thin veneer of Touchet Beds are found northwest and south of the test site where the unit is 6 to 18 feet thick and less than 5 feet-thick, respectively. Given this distribution, the unit has no role in effecting recharge at the test site.

- The top of the alluvial gravel unit beneath the test site is essentially the ground surface. Beneath the test site these uncemented strata are interpreted to range from approximately 30 feet-thick at the east end to over 60 feet-thick at the west end (Figure 5). Based on our interpretations of well logs in the vicinity, this east to west thickening is inferred to be the result of these strata filling a depression in the top of the underlying, indurated Mio-Pliocene conglomerate.

- The origin of the low inferred to be in the top of the Mio-Pliocene conglomerate is not known. The location of the test site near the fault zone that bounds the base of the Horse Heaven Hills suggests this low could be a faulted depression formed in the top of the conglomerate. Alternatively, given the variable quality of driller's geologic descriptions we can not completely discount the possibility that this low is not present, it being the result of poor or inaccurate driller's descriptions. One of the objectives of site-specific characterization work will be to verify the presence of this feature. Mio-Pliocene conglomerate underlying the test site appears to be at least 100 feet-thick (Figure 5).

In the immediate vicinity of the test site the suprabasalt aquifer water table appears to be between 30 and 55 feet bgs. Based on our reconstruction of site-specific geology summarized in the preceding bullets and in Figure 5, this places the water table predominantly within the Mio-Pliocene conglomerate beneath the easternmost portion of the tests site. To the west, where the alluvial gravel thickens, the suprabasalt aquifer water table is interpreted to be within the alluvial gravel. In the test site area, suprabasalt aquifer groundwater flow is inferred to be from generally east to west-northwest. The degree of seasonal variability is not known

Review of first water and final water depth's reported on well logs in the immediate vicinity of the test site suggests the suprabasalt aquifer here consists of an unconfined zone overlying a deeper, semi-confined zone. The transition between these zones may lie approximately 75 feet bgs (Figure 5). The nature of the "confining" horizon(s) that causes this apparent change in aquifer character is not known, but inferred to be well cemented and/or fine grained layers within the upper 20 to 50 feet of the Mio-Pliocene conglomerate. Where the top of the Mio-Pliocene conglomerate drops into the low inferred to underlie and be situated west of the test site, this confining zone would be displaced to depths greater than 95 ft bgs and the overlying unconfined zone would be correspondingly thicker (Figure 5).

The assessment did not find any site-specific hydraulic properties data for any of the aquifers or the vadose zone underlying the Test Site. The only hydraulic properties data found are the general estimates provided in the regional discussions. These suggest porosity, hydraulic conductivity, and transmissivity of gravelly strata in the Basin of 5%, 1.5×10^{-4} to 7.0×10^{-3} ft/s, and 10,000 to 60,000 ft^2/d, respectively. A preliminary engineering report for the materials immediately below the test site (Hewes, 2003) indicates infiltration capacity in the alluvial gravel

of 1.7 to 3.0 gpm/ft^2/foot of head. If these values persist across the entire thickness of the alluvial gravel, porosity, hydraulic conductivity, and transmissivity in the alluvial gravel beneath the test site is probably considerably higher than the regional estimates. If that is the case, the regional estimates are probably more indicative of Mio-Pliocene conglomerate hydraulic properties.

Well Assessment

The OWRD GRID database lists 176 wells in sections 33 and 34, T6N, R35E. Of these, 53 are listed in section 33. Most of these wells are less than 100 feet deep and appear to be open to the shallow aquifer groundwater system which is the target of shallow aquifer recharge. Less than 30 of the wells found in section 33 are in the inferred down gradient direction from the test site.

Surface Water

Surface water found in the vicinity of the test site includes: (1) the Canal, (2) Dugger Creek, (3) Johnson Creek, and (4) Goodman Spring Branch (Attachment 1). The basic characteristics of these four water bodies are discussed below:

- The Canal is an artificial stream operated to deliver irrigation water to users west of Milton-Freewater. The Canal has a capacity of up to approximately 100 cfs and many reaches of it are suspected to leak.

- Dugger Creek appears to be a natural creek that is currently feed by water leaking from, and/or discharged from, the Canal. The head of Dugger Creek is approximately ¾ to 1 mile west of the test site.

- Johnson Creek is a natural spring creek that flows from a spring located in the SE ¼ , SE ¼ , section 29, T6N, R35E, approximately ¾ to 1 mile west-northwest of the test site.

- Goodman Spring Branch is a natural creek that has been modified by channelization. It passes within less than ½ mile north of the test site, paralleling Sunnyside Road.

All three of the natural creeks are reported to have seen reduced flow in the past few years.

Water Quality

As described in the regional hydrogeologic setting, there is little water quality data for the area except what is reported in Richerson and Cole (2000). That report shows TDS and nitrate-N concentrations in groundwater beneath the test site of approximately 125 to 150 mg/l and 2 to 2.5 mg/l, respectively. These parameter concentrations compare to those of approximately 55 mg/l and <0.25 mg/l at Milton-Freewater, where the Walla Walla River enters the Basin. If, as Newcomb (1965) surmises and others suspect, groundwater chemistry near Milton-Freewater is affected by direct recharge from the Walla Walla River, this groundwater chemistry is probably

reflective of surface water chemistry. Therefore, although not a direct measurement of surface water quality, this data is very suggestive of surface water quality and it suggests that recharge water delivered to the test site will be comparable to the water quality data reported in Richerson and Cole (2000).

Preliminary Conceptual Hydrogeologic Model and Possible Effects of Shallow Aquifer Recharge

The objective of this section is to briefly summarize a preliminary conceptual hydrogeologic model for the test site and speculate on possible effects of shallow aquifer recharge on the area surrounding the test site. One of the purpose of this is to identify data gaps to be filled by future site-specific work, including analysis of pilot test monitoring data. We anticipate that this conceptual model, and our assessment of recharge effects, will change as data is collected during subsequent characterization and monitoring activities.

Our conceptual model of how the test will work is summarized below:

1. Relatively good quality Walla Walla River water will be delivered to the test site during peak flow periods in the winter and early spring. This water will rapidly infiltrate from the ponds into the ground, moving downwards through the alluvial gravel.

2. If the alluvial gravel and Mio-Pliocene conglomerate contact is located below the water table at the site:

    a. There may be some lateral spreading of recharge water on the top of the Mio-Pliocene conglomerate,

    b. Spreading will probably be predominantly to the west, into the low spot inferred to be present in the top of the Mio-Pliocene conglomerate, and

    c. If this low turns out to be present, it may act to slow the movement of recharge water away from the test site and provide recharge pathways deeper into the Mio-Pliocene conglomerate than would be the case if the contact was flat.

3. If the water table is above the alluvial gravel and Mio-Pliocene contact, movement of groundwater offsite will be relatively rapid through a saturated alluvial gravel interval. If this is the case, the actual direction of movement can not be determined at this time.

4. Given the groundwater quality trends seen in Richerson and Cole (2000), we infer that recharge will generally improve groundwater quality in the test site area.

5. At this time we do not know what effect, if any, recharge will have on the spring creeks potentially down gradient of the test site. This is in large part due to the lack of site-specific data and information, including water levels, aquifer hydraulic properties, storage data, and ground water velocity and flow direction. These are specific targets of site characterization and pilot test monitoring data collection.

Conclusions and Recommendations

The test site is underlain by uncemented alluvial gravel which overlies indurated Mio-Pliocene conglomerate. Unfortunately, little test site-specific data is available upon which to build a detailed understanding of test site hydrogeology. For example:

- The depth of the suprabasalt aquifer water table at the test site is not well constrained, it could lie either above or below the alluvial gravel/Mio-Pliocene conglomerate contact.
- Although suprabasalt groundwater probably flows from the east to the west-northwest, suprabasalt groundwater flow direction, velocity, and seasonally variability are essentially unknown at the test site.
- A significant portion of the suprabasalt aquifer in the test site area displays at least some evidence of semi-confined conditions.
- The low in the top of the Mio-Pliocene conglomerate currently inferred to be present just west of the test site, based on very limited subsurface data. If present, it could serve to facilitate recharge to deeper parts of the suprabasalt aquifer. If it seems likely that it will, testing and monitoring will need to be designed to not only assess shallower aquifer impacts but also deeper semi-confined suprabasalt aquifer impacts.
- Suprabasalt aquifer and Walla Walla River (Hudson Bay Canal) water quality is generally good, although up-to-date water quality data, including most importantly up gradient and down gradient variations at the test site is unknown.

In addition to addressing the bullet listed above, we recommend that site-specific characterization and monitoring address the following issues:

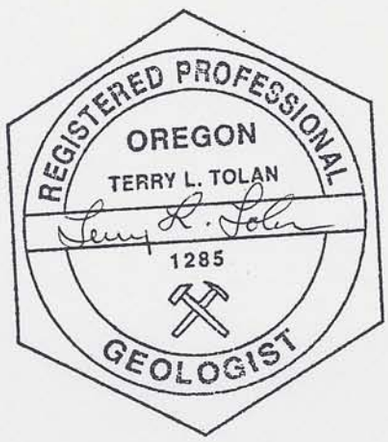
- Identify the three-dimensional extent of the alluvial gravel and Mio-Pliocene conglomerate beneath the test site. This is important to understanding how recharge water will probably move as the uncemented strata may provide for more rapid water movement, both downwards and laterally towards springs, then likely in the more cemented Mio-Pliocene conglomerate.
- Evaluate the inferred low in the top of the Mio-Pliocene conglomerate just west of the test site. If this feature is present, it could affect the amount of recharge that may reach deeper portions of the suprabasalt aquifer.
- The nature and distribution of a possible confining layer within the upper portion of the Mio-Pliocene conglomerate should be investigated in order to better define the thickness and distribution of the unconfined aquifer. If the unconfined aquifer is absent, or only present seasonally, identifying the nature and extent of the confining layer is important since it will inhibit both downward or upward movement of groundwater. Knowing the

extent of this confining layer will provide information on where recharge water may tend to collect and spread atop this layer.

If you have any questions concerning the results of this report please do not hesitate to contact Terry Tolan in our Tri-Cities office at (509) 734-9763. It has been a pleasure working with you on this and we look forward to continuing to work with you on this project.

Very truly yours,
KENNEDY/JENKS CONSULTANTS

Terry Tolan, R.G.
Hydrogeologist



Kevin Lindsey, Ph.D.
Project Manager

Enclosure

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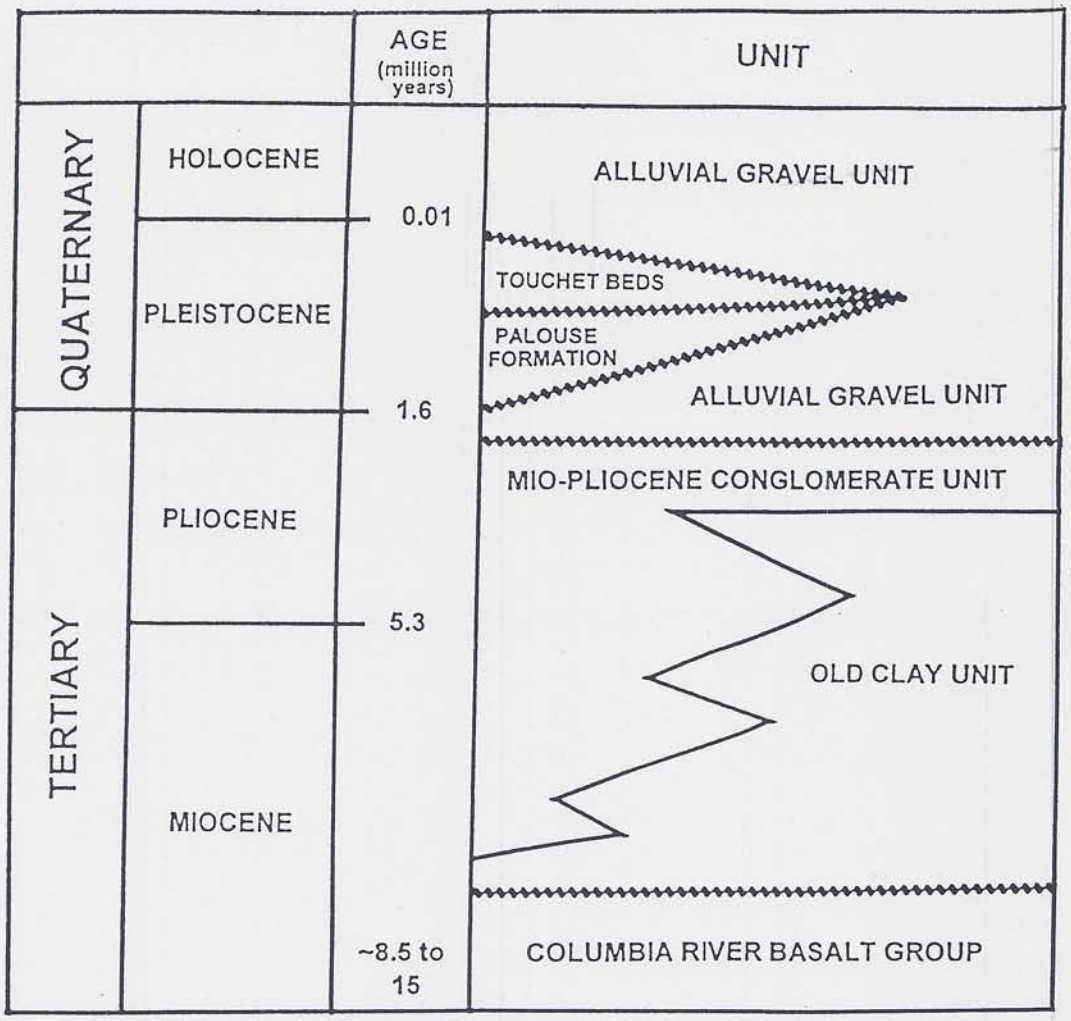

Figure 1. Stratigraphic chart for the suprabasalt sediments in the Walla Walla Basin.

Figure 2. Photograph of interbedded sand and silt typical of the Touchet Beds. Darker layers are sandy, lighter colored layers are silty.

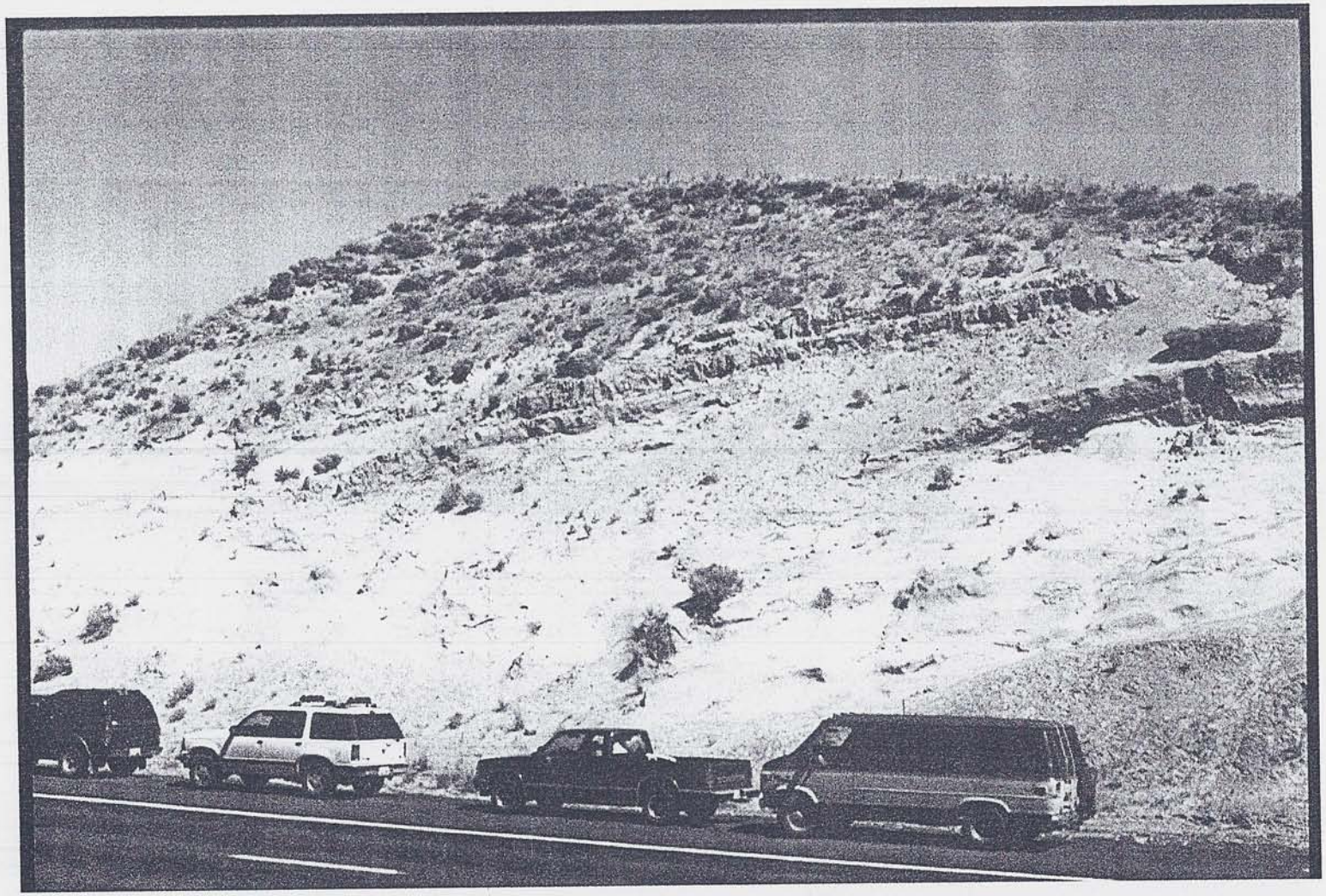

Figure 3. Photograph of massive bedded loess typical of the Palouse Formation.

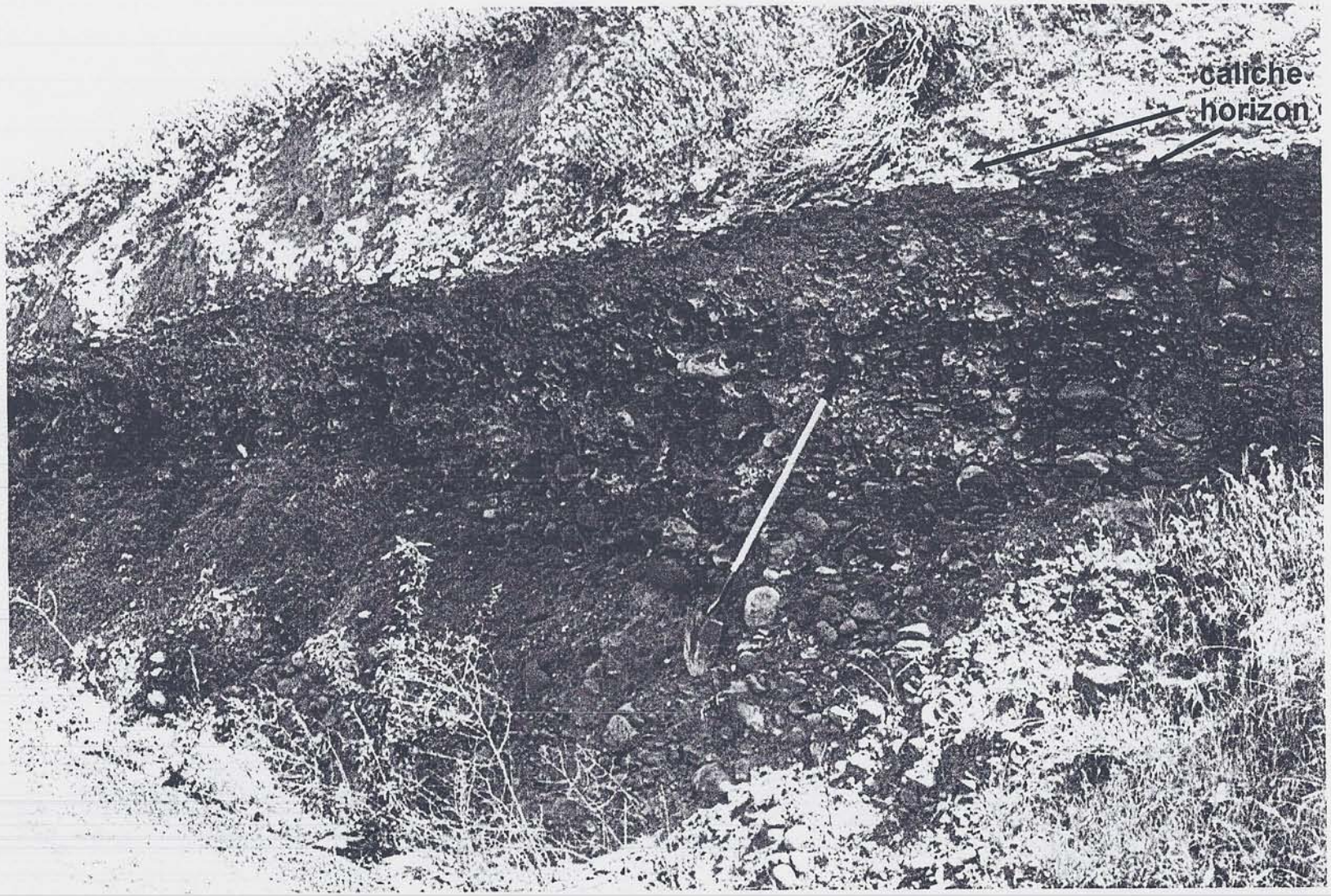

Figure 4. Photograph of indurated basaltic gravel interpreted to be the Mio-Pliocene conglomerate. Note the caliche horizon at the top of the outcrop.

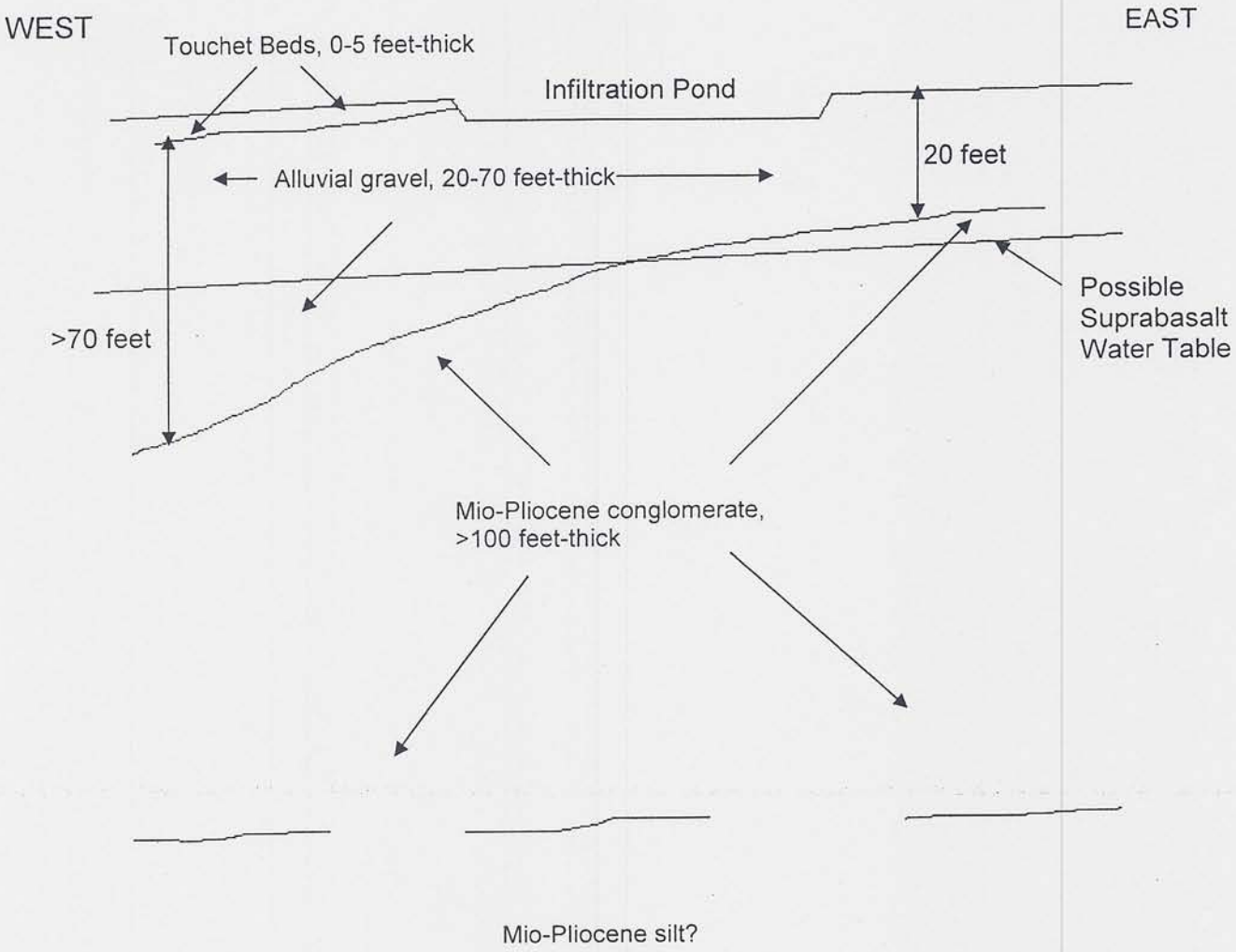

Figure 5. Schematic hydrogeologic cross-section of test site area.

Attachment 6

Well Data Table

Well ID	T/R-sec	easting	northing	year drilled	Surf elev	Touchet top	Touchet isopach	alluvial gravel top	alluvial gravel isopach	Mio-Pliocene conglomerate top	Mio-Pliocene conglomerate isopach	first water	static water
U3885	5/35-1	1850613.13455	1536246.45310		990	NP	0	990	10	NP	0		
U3899	5/35-1	1852276.92661	1536137.15289		1020	1020	12	1008	16	992	175		
U3909	5/35-1	1848682.16421	1534619.09445		1000	1000	3	NP	0	997	157		
U3914	5/35-1	1850479.54541	1536720.08734		1000	NP	0	1000	3	997	157		
U3918	5/35-2	1843472.18763	1535068.43975		961	961	6	955	24	931	40		
U3922	5/35-2	1843314.30956	1536234.30863		948	NP	0	948	48	900	22		
U3930	5/35-2	1846751.19387	1533404.64769		1000	NP	0		0	1000	43		
U3934	5/35-2	1847783.47361	1534740.53912		1000	NP	0	1000	3	997	157		
U3937	5/35-2	1843824.37719	1536683.65393		948	NP	0	948	55	893	40		
U3940	5/35-3	1843071.42021	1535384.19590		958	958	2	956	10	946	120		
U3941	5/35-3	1842500.63023	1535882.11907		939	NP	0	939	34	905			
U3950	5/35-4				909	909	10	NP	0		0		
U3951	5/35-4	1834716.02653	1535177.73996		952	952	20	NP	0	932	132		
U3955	5/35-5	1828060.85832	1535869.97461		873	873	8	NP	0	NP	0		
U3962	5/35-12	1850503.83434	1529931.32998		1066	NP	0	1066	28	1038	42		
U3963	5/35-12	1852094.75959	1529554.85148		1068	NP	0	1068	21	1047	27		
U3965	5/35-12	1851961.17045	1527186.68031		1115	NP	0	NP	0	1115	41		
U4187	6/35-13	1852517.79188	1553631.25840	1987	808	808	9	NP	0	799	>141	14	17
U4195	6/35-13	1848225.17240	1554922.84501		810	810	34	NP	0	776	>162	39	29
U4202	6/35-13	1849184.58533	1555870.11348		813	813	44	769	36	740			
U4204	6/35-13	1850161.76518	1553825.56988	1961	818	818	37	NP	0	781	>85		40
U4206	6/35-13	1853319.32674	1553133.33523		817	?	?	?	?	?	?		
U4217	6/35-14	1844678.98787	1553441.21997	1985	800	NP	0	800	32	768	>68	92	24
U4219	6/35-14	1847508.64881	1553161.89721	1983	820	820	9	811	0	811	>114	23	7.5
U4224	6/35-14	1844934.02169	1554582.79992	1975	789	789	18	771	33	738	>74	24	34
U4249	6/35-15	1841686.37895	1555266.71729		768	NP	0	768	10	758			
U4256	6/35-16	1836304.48646	1554187.46077		762	762	14	748	4	744			
U4258	6/35-16	1837283.01236	1552921.13313	1967	800	800	46	NP	0	754	>104	62	62
U4273	6/35-17	1830490.89136	1552906.74304	1960	730	730	3.5	NP	0	726.5	>196		42
U4275	6/35-17	1828677.74041	1553223.32495	1959	725	725	25	700	15	685	>217		40
U4279	6/35-17	1831857.94961	1554316.97155	1954	730	730	9	NP	0	721	355		
U4282	6/35-18	1821842.44915	1553352.83573	1972	665	665	21	NP	0	644	>82	46	38
U4289	6/35-19	1826461.66703	1547568.02081	1984	723	723	46	NP	0	677	91	46	13
U4293	6/35-19	1824605.34583	1550330.91749	1977	698	698	3	695	57	638	>97	28	30
U4304	6/35-19	1825785.33295	1548632.88724	1957	710	710	12	NP	0	698	>88		18
U4305	6/35-19	1825137.77904	1549510.68254	1958	705	705	18	687	62	625	>120		50
U4317	6/35-20	1830318.21032	1547683.14151	1988	761	761	20	741	21	720	>64	80	38
U4319	6/35-21	1835570.59202	1550489.20845	1987	770	NP	0	770	22	748	>103	51	46
U4327	6/35-21	1832850.86561	1549194.10063	1968	761	761	6	NP	0	755	>104		31
U4329	6/35-21	1833455.24925	1549150.93037		767	767	17	NP	0	750	108		

Well ID	T/R-sec	easting	northing	year drilled	Surf elev	Touchet top	Touchet isopach	alluvial gravel top	alluvial gravel isopach	Mio-Pliocene conglomerate top	Mio-Pliocene conglomerate isopach	first water	static water
U4332	6/35-21	1837527.64384	1552244.79904	1965	780	780	22	758	43	715	>98		32.5
U4345	6/35-21	1835081.32907	1547467.29020		797	797	9	788	5	783	354		
U4347	6/35-21	1833210.61778	1547668.75142	1951	785	785	20	NP	0	765	>169		22
U4348	6/35-21	1837412.52314	1550618.71923	1943	782	782	3	779	15	764	>153	40	44
U4367	6/35-22	1839168.11374	1549021.41958	1974	819	819	12	NP	0	807	330	21	26
U4369	6/35-22	1842636.12468	1552546.99087	1969	810	810	27	783	9	774	>82	47?	54
U4370	6/35-22	1840952.48451	1549194.10063		840	840	47	NP	0	793	37		
U4381	6/35-22	1841038.82504	1549597.02306		840	840	7	833	31	802	240		
U4404	6/35-23	1843360.86335	1549077.08306		840	840	35	805	15	790			
U4406	6/35-23	1847210.65956	1552125.34442	1979	815	815	4	811	36	775	>80	75	20
U4412	6/35-23	1843482.30802	1548154.10353	1975	840	840	9	831	36	795	>87	12	30
U4416	6/35-23	1845206.82242	1548105.52566		850	850	8	842	25	817	226		
U4452	6/35-23	1847635.71593	1547692.61376	1946	850	850	8	NP	0	842	144	NR	NR
U4461	6/35-24	1850683.97728	1550728.73065		846	846	65	NP	0	781			
U4462	6/35-24	1848631.56226	1549660.01751	1987	840	840	18	822	17	805	>111	65	29
U4464	6/35-24	1848340.09504	1548700.60457	1985	850	850	5	845	7	838	>100	5	16
U4469	6/35-24	1849748.85328	1548239.11480	1982	856	856	5	851	18	833	>82	15	10
U4471	6/35-24	1852663.52549	1552526.11185		813	813	34	NP	0	779			
U4478	6/35-24	1850356.07666	1549380.69475	1977	845	845	39	806	>61			39	32
U4479	6/35-24	1851291.20066	1551117.35361	1977	840	840	28	812	52	760	>25	28	27
U4482	6/35-24	1851145.46705	1552441.10058	1977	839	839	25	814	>80			43	29
U4506	6/35-24	1848908.86094	1552726.49556		843	843	49	NP	0	794			
U4538	6/35-25	1852420.63614	1544535.05220	1979	890	NP	0	890	100	790	90	65	27
U4590	6/35-25	1851764.83489	1547291.84634	1934	859	NP	0	859	27	832	63	NR	NR
U4599	6/35-25	1852967.13718	1543818.52862	1926	892	892	6	NP	0	886	>26	NR	6
U4610	6/35-25	1852262.75806	1546490.31148	pre-1917	870	870	20	NP	0	850	>155	NR	NR
U4642	6/35-26	1848157.92803	1542482.63719	1981	917	NP	0	917	7	910	>98	65	34
U4643	6/35-26	1843652.33057	1545324.44259	1977	865	NP	0	865	35	830	>67	38	28
U4644	6/35-26	1845000.36647	1542919.83802	1977	905	NP	0	905	24	881	>81	45	33
U4648	6/35-26	1845886.91260	1542519.07059	1974	908	NP	0	908	12	896	>103	61	49
U4653	6/35-26	1844077.38693	1542931.98249	1968	895	NP	0	895	20	875	>130	NR	54
U4690	6/35-26	1844878.92179	1545579.47641	1925	870	870	8	862	24	838	>68	NR	NR
U4691	6/35-26	1845291.83369	1546332.43340		863	863	10	NP	0	853			
U4707	6/35-27	1839687.61171	1545304.42671	1988	845	NP	0	845	42	803	>78	70	16
U4712	6/35-27	1840999.21421	1544041.40209	1982	865	NP	0	865	12	853	>138	49	34
U4714	6/35-27	1838133.11986	1545231.55991	1981	830	830	11	819	31	788	>113	44	32
U4715	6/35-27	1839204.86913	1547028.94110	1981	830	830	12	818	18	800	>125	45	20
U4718	6/35-27	1842760.16200	1542292.59876	1977	893	NP	0	893	41	852	>159	80	50
U4730	6/35-27	1841242.10356	1542183.29855		882	882	50	NP	0	832	330		
U4731	6/35-27	1842663.00626	1546518.87347		850	850	30	NP	0	820			

Well ID	T/R-sec	easting	northing	year drilled	Surf elev	Touchet top	Touchet isopach	alluvial gravel top	alluvial gravel isopach	Mio-Pliocene conglomerate top	Mio-Pliocene conglomerate isopach	[illegible] water	static water
U4759	6/35-28	1834534.50577	1543941.71892	1981	910	NP	0	910	46	864	>79	NR	14
U4762	6/35-28			1978	800	800	14	NP	0	786	>301	180	93
U4763	6/35-28	1836563.50802	1544344.64135	1978	830	830	5	NP	0	830	>118	35	23
U4764	6/35-28			1977	805	805	12	793	43	750	>51	24	12
U4774	6/35-28	1837498.86367	1545006.58535	1971	832	832	14	NP	0	818	>90	34?	23
U4775	6/35-28	1837426.91323	1542358.80936		846	846	12	NP	0	834	130		
U4785	6/35-34	1843119.99808	1538335.30152	1908	930	930	2	NP	0	928	>98	NR	20
U4797	6/35-29	1829138.22319	1545193.65648	1988	750	NP	0	750	10	740	>330	70	67
U4799	6/35-29	1827598.48390	1542258.07875	1978	750	750	11	739	83	656	>67	90	62
U4801	6/35-29	1828893.59172	1544934.63491	1976	750	NP	0	NP	0	750	>110	43	31
U4806	6/35-29	1828461.88911	1545222.43665	1954	745	NP	0	NP	0	745	>109	NR	20
U4808	6/35-29	1827497.75329	1546301.69317		731	731	11	720	46	674			
U4819	6/35-30	1823900.23157	1543941.71892	1985	710	710	6	704	11	693	>83	60	39
U4824	6/35-30	1821971.95993	1543812.20814	1977	692	NP	0	692	77	615	>28	31	26
U4828	6/35-30	1822418.05262	1545064.14569	1971	690	690	3	687	15	672	>90	NR	32
U4839	6/35-30	1821871.22932	1545121.70604	1955	685	NP	0	685	36	649	>101	NR	40
U4840	6/35-30	1823813.89105	1546431.20395	1955	702	702	5	697	30	667	>205	35(?)	14
U4848	6/35-31	1825166.55922	1541236.38259	1966	761	761	15	746	30	716	>60	NR	30
U4853	6/35-32	1830635.48544	1537181.57710		856	856	12	NP	0	NP	0		
U4856	6/35-32	1827656.04425	1541610.52485	1981	762	762	16	746	17	729	>87	16	16
U4857	6/35-32	1829190.29380	1539853.35996		833	833	8	825	4	NP	0		
U4858	6/35-32	1830963.38606	1538845.36916	1979	840	840	12	828	23(?)	805?	>146	29	20
U4859	6/35-32	1832445.01110	1538918.23596	1970	815	815	6	NP	0	809	>132	30?	19
U4864	6/35-32				833	833	32	NP	0	801	193		
U4873	6/35-33	1837314.94259	1537655.21134	3/82	876	876	3	873	31	842	>171	110	67
U4876	6/35-34	1841771.96218	1540314.84973	1908	903	NP	0	903	44	859	>56	NR	42
U4879	6/35-33	1834594.58186	1538602.47981	3/80	837	837	2	835	8	827	265	125	70
U4880	6/35-33	1832462.33326	1541912.71667	12/79	804	804	18	NP	0	786	>112	65	16
U4881	6/35-33	1832566.45578	1539270.42552	10/79	817	817	3	814	38	776	>95	60	32
U4882	6/35-33	1835815.22350	1541092.48172	8/79	842	NP	0	842	35	807	>150	173	60
U4888	6/35-33	1833138.66734	1540991.75111	12/71	815	815	6	809	2	807	>97	24	24
U4897	6/35-33	1837266.36472	1538578.19087	4/53	870	870	3	867	29	838	>118		52
U4898	6/35-33	1833793.04700	1538371.73492	-/16	834	834	3	NP	0	831	>87		35
U4903	6/35-33	1835153.22736	1540630.60589	-/26	834	834	10	824	>65				
U4906	6/35-33	1832894.35640	1539270.42552	-/22	819	819	3	NP	0	816	>47		6
U4907	6/35-33	1833800.61134	1540991.75111	<-/20	821	821	10	811	>30				20
U4912	6/35-33	1833793.04700	1538031.68983	1916	835	NP	0	835	3	832	>137		
U4914	6/35-33	1837825.01022	1537400.17752	-/15	882	882	2	880	28	852	>60		20
U4917	6/35-33	1835201.80523	1539306.85892	1910	835	NP	0	835	95	740	>21		32
U4924	6/35-34	1839585.95802	1539233.99212	1988	893	NP	0	893	18	875	72	50	111

Well ID	T/R-sec	easting	northing	year drilled	Surf elev	Touchet top	Touchet isopach	alluvial gravel top	alluvial gravel isopach	Mio-Pliocene conglomerate top	Mio-Pliocene conglomerate isopach	first water	static water
U4929	6/35-34	1842889.25319	1537448.75539	1982	925	NP	0	925	38	887	>214	148	110
U4936	6/35-34	1842743.51958	1538906.09149	1978	924	NP	0	924	120	804	>42	45	15
U4938	6/35-34	1843083.56467	1538019.54536	1977	932	NP	0	932	41	891	>101	35	36
U4939	6/35-34	1841152.59433	1537132.99923	1977	922	NP	0	922	70	852	>50	80	47
U4946	6/35-34	1839950.29205	1539768.34869	1973	891	NP	0	NP	0	891	>125	117	45
U4948	6/35-34	1842415.61896	1539962.66017	1971	895	NP	0	895	40(?)	855?	>88	61(?)	41
U4954	6/35-34	1840011.01438	1537157.28817		912	NP	0	912	20	892	169		
U4970	6/35-34	1842294.17428	1538311.01258	1960	923	NP	0	923	22	901	141	NR	40
U4971	6/35-34	1839646.68036	1537339.45518	1959	905	NP	0	905	20	885	>92	40	35
U4973	6/35-34	1842901.39766	1540144.82718	1959	915	NP	0	NP	0	915	>121	NR	23
U4975	6/35-34	1839525.23568	1536938.68775	1956	905	NP	0	905	26	879	>84	10	19
U5	6/35-30	1821986.35002	1546632.66516	1987	681	681	4	677	6	671	>111	40	39
U50011	6/35-13	1848856.68471	1553599.09805	1995	810	810	44	NP	0	766	>146	181	
U50016	6/35-33	1833222.25702	1537278.73284	11/95	865	865	29	836	10	826	>202	41	100
U50068	6/35-31	1822668.71473	1539671.19295	1996	738	738	42	696	>126?			90	60
U50069	5/35-12	1853357.78422	1531534.39969		1163	1163	11	NP	0	1152	115		
U5021	6/35-34	1838626.54508	1537436.61092	<1900	890	NP	0	890	1.5	888	>91		20
U5025	6/35-34	1838165.05532	1539404.01466	?	875	NP	0	875	3	872	>42		30
U50250	6/36-18	1854145.15053	1555865.84042		835	835	63	NP	0	772	144		
U5027	6/35-35	1843397.29675	1541183.17916		909	909	18	891	6		0		
U5039	6/35-35	1845063.11288	1537582.34453	1983	952	NP	0	952	98	854	>92	103	86
U5042	6/35-35	1845718.91413	1540132.68272	1982	933	NP	0	NP	0	933	226	80	70
U5043	6/35-35	1847625.59554	1537618.77793	1982	970	NP	0	970	34	936	>119	46	34
U5044	6/35-35	1845243.25582	1541462.50191	1982	918	NP	0	918	17	901	>85	75	60
U50473	6/35-36	1851706.13663	1539707.62635	1997	952	NP	0	952	18	934	>87	NR	38
U50478	6/35-34	1837837.15469	1539112.54744		875	NP	0	875	27	848	216		
U5048	6/35-35	1843970.11080	1536975.12115		947	NP	0	NP	0	947			
U5049	6/35-35	1845731.05860	1538869.65809	1981	947	NP	0	947	152 ?			114	50
U5050	6/35-35	1846069.07961	1541243.90150		922	NP	0	922	12	910			
U50516	5/35-4	1834752.45994	1536550.06479		921	921	55	NP	0	866	71		
U5052	6/35-35	1846567.00278	1541644.66893	1981	920	NP	0	920	30	890	>247	50	34
U5053	6/35-35	1843761.63078	1541608.23552	1979	908	NP	0	908	80	828	>20	80	45
U5057	6/35-35	1845158.24455	1541729.68020	1977	915	NP	0	915	30	885	>132	46	36
U50577	6/35-32	1831194.13094	1539100.40297		820	820	12	808	17	791	385		
U5058	6/35-35	1845706.76966	1537618.77793		958	NP	0	958	26	932	119		
U5059	6/35-35	1846629.74920	1540557.73908	1977	935	NP	0	935	27	908	>98	45	34
U50804	6/35-34			1997	930	NP	0	930	86(?)	844?	>96?	46	43
U5091	6/35-35			1960	944	NP	0	944	>167?			NR	60
U50953	6/35-34	1841529.07283	1538772.50235		905	NP	0	905	30	875	220		
U51035	6/35-13	1851655.53468	1554359.92645	1998	802	802	13	789	25	764	>120	14	5.5

Well ID	T/R-sec	easting	northing	year drilled	Surf elev	Touchet top	Touchet isopach	alluvial gravel top	alluvial gravel isopach	Mio-Pliocene conglomerate top	Mio-Pliocene conglomerate isopach	[illegible] water	static water
U51045	6/35-21	1834951.81829	1551438.95418		761	NP	0	NP	0	761			
U5121	6/35-36	1849908.75543	1540436.29440	1987	944	NP	0	944	40	904	>80	35	50
U5126	6/35-36	1848801.58481	1541365.34617	1985	931	NP	0	931	60	870	>41	55	34
U5128	6/35-36	1848789.44034	1541790.40254	1985	924	NP	0	924	55	869	>47	78	36
U5132	6/35-36	1849495.84354	1537460.89986		981	NP	0	981	10	971			
U5148	6/35-36	1851086.76879	1537485.18879	1961	980	NP	0	980	20	960	>115	NR	30
U51581	5/35-3				954	954	2	952	83	869	15		
U5172	6/36-19	1855505.33090	1550813.74192		843	843	28		0	815			
U51921	6/35-22	1839499.08574	1547884.60272	1998	820	820	48	NP	0	772	>110	52	69'
U5200	6/36-30	1853962.98352	1544486.47433	1978	900	NP	0	900	47	853	118	85	28
U5211	6/36-30	1855651.06451	1545846.65470		889	889	6	NP	0	883	145		
U5227	6/36-31	1856466.76791	1539792.63762		970	970	26	NP	0	944	233		
U5230	6/36-31	1854147.17461	1537983.11196		974		0	NP	0	974	467		
U5238	6/36-31	1856187.44516	1539780.49316		968	968	20	NP	0	948	180		
U52581	6/35-15	1842434.66346	1555827.93068	1998	770	770	5	765	19	746	>91	24	30
U5268	6/35-28	1835757.66315	1546963.63716	1989	810	810	9	801	34	767	>77	98	26
U5316	6/35-35	1845075.25735	1540569.88355	1989	930	NP	0	930	36	894	>149	60	43
U53413	6/35-15	1840707.85304	1553424.78617		781	NP	0	NP	0	781			
U53462	6/35-34			1999	905	NP	0	905	71(?)	834	>122?	41	33
U53471	6/35-17	1828720.91067	1555108.42633	1999	695	695	8	687	18	669	>123	55	43
U5358	6/35-36	1850613.13455	1537898.10069	1990	980	NP	0	980	38	942	>65	80	35
U53647	6/35-36	1851861.99063	1541875.41381	1999	920	920	5	915	60	855	>55	46	34
U53762	6/35-36	1853078.46146	1537788.80048	2000	980	980	5	975	68	907	>60	45	19
U53769	6/35-34	1839828.84737	1539962.66017	2000	890	890	2	888	66	822	>182	NR	49
U53863	6/36-19	1854764.51838	1547814.05844		859	859	6		0	853			
U53932	6/35-30	1822475.61297	1546647.05525	2000	685	NP	0	685	25(?)	660	>101	75	47
U53996	6/35-27	1842335.10564	1544405.73611	2000	870	NP	0	870	65	805	>60	40	34
U54050	6/35-36	1848487.85273	1537995.25643		964	964	2	NP	0	962			
U54063	6/35-26	1845413.27836	1547255.41293		859	859	10	849	66	783			
U5408	5/35-12	1851779.00344	1529907.04104		1063	NP	0	1063	26	1037	8		
U54134	6/35-26	1847149.93722	1545713.06555		879	879	4	NP	0	875	260		
U54145	6/35-36	1849046.49824	1538553.90193	2001	965	NP	0	965	51	914	>71	NR	47
U54341	6/35-34	1838506.16975	1541337.11320		863	NP	0	863	2	861	349		
U54464	6/35-35	1843277.87615	1539999.09357		918	NP	0	918	37	881	202		
U5464	6/35-28	1834361.82473	1542056.61754		822	822	9	NP	0	813	295		
U5477	6/35-35			1990	951	NP	0	951	95	856	>77	35	30
U5496	6/35-28	1835685.71272	1544272.69092		820	820	9	NP	0	811	387		
U5512	6/35-34	1838520.55983	1541135.65198	7/90	865	NP	0	865	34	831	>146	NR	42
U5530	5/35-3	1839391.64654	1534813.40593		920	920	18	NP	0	902	90		
U5625	6/35-14	1843173.07390	1554145.59909		781	781	5	776	36	740			

Well ID	T/R-sec	easting	northing	year drilled	Surf elev	Touchet top	Touchet isopach	alluvial gravel top	alluvial gravel isopach	Mio-Pliocene conglomerate top	Mio-Pliocene conglomerate isopach	first water	static water
U5657	6/35-27	1841035.64761	1545365.14905	1992	852	852	4	848	11	837	>289	55	34
U5670	6/35-34				909	NP	0	909	8	901	187		
U5743	6/35-30	1826101.91486	1546287.30308	1992	723	723	12	711	25	686	>148	55	52
U5841	6/35-21	1834635.23638	1550618.71923	1995	765	765	3	762	65	697	>147	42	36
U5958	6/35-25	1849202.35224	1544280.01838		899	NP	0	899	24	875			
U5965	6/35-36	1848548.57507	1540812.77290	1993	938	NP	0	938	23	915	>82	NR	34
U6017	6/35-13	1852505.64741	1554444.93772		813	813	44	NP	0	769			
U6053	6/35-34	1838225.77765	1538881.80256		879	NP	0	879	9	870	260		
U6192	6/35-20	1831512.58753	1552417.48009	1978	738	738	16	722	10	712	324	16	13
U6194	6/35-20	1829109.44302	1551913.82705	1955	745	745	67	NP	0	678	>208		68
U6196	6/35-20	1831095.27501	1549942.38514	1976	770	770	46	NP	0	724	>79	68	42
U6208	6/35-21	1837513.25375	1548733.61785	1978	797	979	7	790	63	727	>80	50	59
U6217	6/35-33	1832991.51214	1539853.35996	8/94	816	NP	0	816	16	800	>186	68	50
U6281	6/35-26	1843202.98527	1543964.26223	1994	878	NP	0	878	16	862	>94	55	40
U6342	6/35-15	1839945.17843	1554504.04268	1995	765	NP	0	765	35	730	>67		30
U6355	6/35-34	1838614.40062	1538651.05768		886	NP	0	NP	0	886	243		
U6377	6/35-33	1835138.88942	1541293.94293	6/95	835	835	12	823	28	795	>52	55	32
U6405	6/35-29	1831253.56596	1546272.91299	1995	768	768	10	758	54(?)	704?	>59?	25	55
U6441	6/35-26	1846117.65748	1545275.86472	1981	878	NP	0	878	15	863	>85	65	36
U6443	6/35-27	1840379.84636	1542183.29855	1981	865	NP	0	865	30	835	>140	60	36
U6445	6/35-29	1830505.28145	1545193.65648	1981	765	NP	0	765	27	738	>116	47	43
U6447	6/35-30	1823727.55053	1544949.02500	1982	703	NP	0	703	24	679	>96	60	18
U6449	6/35-30	1823612.42983	1546186.57247	1986	698	698	2	696	33	663	>67	NR	54
U6466	6/35-35	1838772.27869	1537120.85476		938	938	3	935	27	908			
U6468	6/35-35	1843581.48784	1537643.06687	1966	951	NP	0	NP	0	951	69	NR	73
U6475	6/35-36	1851026.04645	1540399.86100		939	939	23	NP	0	916	141		
U6509	5/35-1	1850030.20011	1534971.28401		1004	NP	0	1004	33	971	62		

Attachment 7

Test and Monitoring Plan

PRELIMINARY CHARACTERIZATION, MONITORING, AND TESTING PLAN, HUDSON BAY DITCH SHALLOW AQUIFER RECHARGE PROJECT

Introduction

Surface water and shallow groundwater in the Walla Walla Basin (the Basin) form an interconnected system. In some areas, especially upstream areas where streams leave the mountains and highlands surrounding the Basin to flow out onto the Basin floor, streams historically probably branched out onto the Basin floor and some of the water they carried seeped into the ground, recharging the shallow groundwater system. This shallow groundwater, recharged near the edge of the Basin, formed the main source of clean, cool groundwater found further down basin where it returned to the surface via springs and base flow to the Walla Walla River. Over the past 100 or more years this system has been modified both as a result of efforts to increase water supply for human use and to control flooding.

Shallow aquifer recharge is being explored in the Basin in large part to restore some fraction of the natural historical shallow aquifer recharge that has been lost, in part, because of modifications to surface water drainages in the Basin. These modifications have benefited the economic and social values of the Basin, but at some cost to natural habitat. It is hoped that shallow aquifer recharge projects, by mimicking natural historical shallow aquifer recharge that occurred in the Basin, will directly benefit habitat in streams that were in part maintained by natural spring and groundwater discharge.

The Walla Walla Basin Watershed Council (WWBWC), in cooperation with the Hudson Bay Improvement District (HBID), has proposed to test shallow aquifer recharge at a site located adjacent to the Hudson Bay Canal in section 33, T6N, R35E. At the test site a series of three infiltration ponds will be built. Water will be supplied to these ponds via a diversion from the canal. Recharge activities are proposed for winter and spring months when the Walla Walla River (the source of water for the canal) displays peak annual flows. The proposed shallow aquifer recharge testing will be done under an ASR Testing Limited License granted by Oregon Water Resources Department (OWRD) (OAR 690-350-0020).

The Limited License Application requires several supporting documents be attached (690-350-0020 (3)(b)), including (but not limited to) those describing proposed testing, groundwater conditions (including hydrogeologic conditions and groundwater quality), and source water quality. Some of this information is reported in the 3 July 2003 hydrogeologic assessment report. Information not included in the assessment report, but still needed for the Application, will be collected during proposed site-specific hydrogeologic characterization, monitoring, and testing. Preliminary characterization, monitoring, and testing plans are described here. These, especially the monitoring and testing plans, will be modified as information is collected.

Preliminary Test Site Specific Hydrogeologic Characterization

Site-specific hydrogeologic characterization is designed to identify and define local conditions which provide a technical basis for designing the monitoring which will be used to evaluate testing. For this project a number of characterization needs are outlined in the 3 July 2003 hydrogeologic assessment letter report. These needs include determining the physical properties of the geologic units underlying the test site, investigating the presence of a possible semi-confined aquifer in the upper part of the suprabasalt aquifer system, identifying aquifer

hydraulic properties, and establishing suprabasalt aquifer baseline conditions, including seasonal variation, for groundwater depth, flow direction, and quality. These, and other site characterization issues, will be addressed using test site-specific hydrogeologic characterization data collected predominantly using:

1. Test pits, boreholes, and wells constructed for the direct observation of subsurface conditions,

2. Infiltration tests (constant and falling head) designed to evaluate spatial variability at a site both laterally and vertically (note, the water source for this activity may require a temporary permit),

3. Aquifer testing and water level measurements to evaluate baseline aquifer physical conditions before testing,

4. Surface and ground water quality data collected to evaluate the affect (if any) of test site operation on area groundwater quality,

5. Well and canal records describing water use in the project area, and

6. Water flow metering at the test site that indicates surface water in-flow and out-flow during testing.

At this time, geophysical investigations are not being considered because of the lack of subsurface control and ground truth data that could be used to constrain geophysical interpretations. The following sections describe proposed soils, geologic, hydrogeologic, surface water, and water quality characterization for this project.

Soils

The nature and extent of surface soils effect how fast water can infiltrate into the ground. However, the infiltration ponds proposed at the test site will be excavated through the surface soil layer. Therefore, surface soil conditions and properties are largely irrelevant to the project except in as far as the amount of soil at the site controls the amount of excavation needed for the infiltration ponds. The proposed characterization work will simply look at surface soils to the extent necessary to determine how much soil will probably need to be removed for infiltration pond construction.

Geology

Geologic features control the physical characteristics of aquifer hosting materials, and therefore the distribution and movement of groundwater through an aquifer. Understanding the nature and occurrence of these features, both regionally and locally, provide constraints on testing, data interpretation, monitoring, mitigation, and final design. The objective of geologic characterization is to develop a three dimensional physical framework that describes the materials hosting the vadose zone and groundwater at the test site. Within this framework, or conceptual model, the nature and distribution of those factors thought to control groundwater movement and distribution will be evaluated.

Site-specific geologic characterization will be accomplished largely through the analysis of data collected during the drilling of several proposed boreholes at the site and comparison of that

data to information collected during the preparation of the hydrogeologic assessment report. A minimum of three boreholes are proposed for the immediate vicinity of the test site. One of these boreholes will be located on the inferred up-gradient side of the test site, two will be located on the inferred down-gradient side. In the assessment report we also recommend that at least one more down gradient well be placed near the test site. In addition, we recommend the placement of several additional boreholes located more distally from the test site in both the inferred up- and down-gradient directions. Subsurface hydrogeologic conditions will be interpreted via drilling cuttings and spilt-spoon sample logging.

The project hydrogeologic assessment identified work needed to complete site-specific hydrogeologic characterization. Hydrogeologic characterization targets, and the rational for them, are described below.

- It is likely that the uppermost, unconfined part of the shallow aquifer system, is hosted by predominantly uncemented alluvial gravel beneath the test site. However, it is not clear from the available data how deep the alluvial gravels extend and what their properties are beneath the test site. Identifying the three-dimensional extent of these strata is critical to the proposed testing because water probably will move more rapidly through these uncemented strata, both downwards and laterally, then in the deeper, more cemented Mio-Pliocene conglomerate that comprises the majority of the shallow aquifer system in the area.

- Area data indicates that, if present, the unconfined part of the shallow aquifer system at the site may be relatively thin and underlain by a semi-confined zone at depths of less than 75 feet bgs. Characterization will identify if this semi-confined zone is actually present, and if found, the nature of the confining layer separating it from the overlying unconfined zone and the basic hydrologic properties of the semi-confined zone. Knowing the nature and extent of the confined aquifer underlying the site is critical in evaluating if the proposed recharge will affect this deeper aquifer. If data collected indicates that the project could potentially affect this deeper aquifer, monitoring will need to be designed to not only assess shallower unconfined aquifer impacts but deeper confined aquifer impacts as well.

- The nature and distribution of the confining layer atop the confined aquifer should be identified in order to support evaluation of the thickness and distribution of the unconfined aquifer (if present). If the unconfined aquifer is absent, or only present seasonally, we will still need to identify the nature and extent of the confining layer because, just as it inhibits upward movement of groundwater, it will restrict the downward movement of recharge water. Knowing where the confining layer is will provide information on where recharge water collecting on top of it will spread to.

- Mapping for the assessment identified a potential depression in the top of the older Mio-Pliocene conglomerate below the western end, and west of, the test site. The depth, shape, and orientation of this feature will need to be evaluated because it will effect how the aquifer(s) underlying the test site respond to the testing. If an unconfined aquifer indeed underlies the site, this depression may act as a "reservoir" for water introduced into this aquifer. Alternatively, it may serve as a recharge pathway, hydrologically connecting the upper, unconfined part of the suprabasalt aquifer system with deeper, confined parts of the aquifer system.

The assessment did not provide any site-specific geologic properties data for any of the geologic units hosting the vadose zone and upper part of the suprabasalt aquifer underlying the test site.

Hydrogeology

Piezometers (observation wells) will be constructed in at least three of the borings drilled for geologic characterization. If additional geologic characterization boreholes are drilled (either close to or more distal from the test site) we also recommend that at least three of these be converted to observation wells. All but one of the boreholes converted to monitoring wells should be completed as 2-inch observation wells that fully penetrate the unconfined aquifer (if present) or above the confining layer (if unconfined aquifer not present). At least one of the geologic characterization boreholes should be of sufficient size to accommodate a 4-inch diameter well which will be used for aquifer testing.

Test site-specific hydrogeologic work would be done, in large part, concurrently with the site-specific geology work. The hydrogeologic assessment concluded that the following information must be collected for the uppermost part of the suprabasalt system at the test site:

- Depth, thickness, and lateral and vertical extent of the vadose zone and the uppermost aquifer(s) underlying a site.
- Nature and effect of perching layers (if any) in the vadose zone.
- Aquifer and vadose zone physical and hydrologic properties - including, grain size, matrix content, induration, hydraulic conductivity, transmissivity, porosity
- Groundwater flow direction and velocity, including both spatial and temporal variation
- Anthropomorphic effects, primarily changes in groundwater pumping, surface water (including canals), and irrigation activities.

Ideally, several months to several years of baseline hydrogeologic data should be collected prior to testing so that an adequate site background condition can be established against which test data can be compared to evaluate test success. Water level data will be collected periodically, with the sampling frequency initially being small, later decreasing as testing progresses and more is learned about water level variation in the target aquifer.

For characterization it is important to build monitoring wells in such a way as to provide means for accurately measuring the target aquifer. Well construction considerations are listed below:

- Most project wells will probably be 2 inch-diameter piezometer type installations. These should be built to ensure that they are monitoring the anticipated aquifer targets, and we recommend building to well construction standards and avoiding cost cutting measures designed to get more/cheaper wells (these commonly result in poorly built wells unsuitable for collection of the high quality data we feel is necessary to support the project).
- For aquifer testing, a 4 inch-diameter well is the minimum recommended diameter and at least one should be built.

- The minimum number of wells at the test site is 3, one up gradient and 2 down gradient. We do not recommend this. At a minimum we recommend 4 wells, one up and three down gradient, with more eventually being built as the test progresses and potentially unanticipated changes in the groundwater system are identified. Most, if not all, of these wells would be built in geotechnical borings drilled for geologic characterization.

- In addition to the wells built near the test site, it seems likely that wells will eventually need to be built more distant from the site. The purpose of these wells would be to more accurately trace the down gradient migration of recharge water away from the test site. A minimum of 4 wells, 1 well up gradient and 3 wells down gradient is again recommended. These might include at least some previously built groundwater supply wells that would be available for use. However, these should only be used if construction details can be verified and if they are not being used as water supply wells. Access to offsite well drilling locations will need to be acquired from willing land owners. Many offsite wells used in characterization may be unused water supply wells from which data is collected upon which to base decisions for building new monitoring wells.

- Aquifer testing designed to collect aquifer hydraulic property data will be part of site characterization. During aquifer testing, the 2-inch observation wells will be monitored to observe the effects of testing on the surrounding aquifer. Aquifer testing would include an 8 hour step drawdown test to establish probable sustainable yields in the suprabasalt aquifer, followed by a 24 to 72 hour constant discharge test. Water level data collected during aquifer testing will be analyzed using standard analysis techniques.

Combining the interpretations developed in the completed hydrogeologic assessment with the drilling and testing data collected during site specific characterization, a conceptual model of Test Site hydrogeologic conditions will be prepared.

Surface Water

One of the main objectives of the project is to increase surface water quantity and improve its quality. To document that, surface water bodies that the project might influence need to be identified and monitoring points on them established and characterized (includes collection of baseline data). These locations will be used as monitoring locations during subsequent testing.

The hydrogeologic assessment identified three spring-feed streams that are those most likely to be effected by shallow aquifer recharge, Goodman Spring Branch, Johnson Creek, and Dugger Creek. During test-site specific characterization these streams will be examined and monitoring points identified. At these points stream conditions will be photographed and stream conditions documented prior to the initiation of testing. Documentation of pre-test background conditions will include the following parameters:

- Flow volume and discharge
- Water temperature
- Water quality
- Hydrophilic plants and habitat quality

Sampling frequency will be designed to collect enough data to demonstrate the range of conditions likely at the monitoring points so that site background conditions can be documented enough to provide an adequate baseline to measure test results against.

Water Quality

Both surface and groundwater quality at the test site, and at likely down-gradient discharge points, needs to be documented. There are several reasons for this, including:

- We do not want to introduce contaminated water into the shallow aquifer via recharge activities and violate antidegradation rules. We need to establish background water quality parameter concentrations and monitor source-water quality periodically during testing and operations.
- Certain source-water conditions (e.g., turbidity) have the potential to degrade or even "plug" the recharge system. From an operational standpoint, one would monitor for those conditions and halt test operations when the source-water exceeded those conditions.
- Up-gradient groundwater quality needs to be monitored so that the effects of recharge on water quality can be differentiated from those water quality conditions caused by recharge activities, including leaching of vadose zone constituents by recharge water.

Sampling Quality Assurance and Quality Control (QA/QC) protocols will need to be established and followed for characterization and later monitoring. The sampling QA/QC protocol will need to describe:

- Sampling equipment
- Measurement techniques for field parameters
- Decontamination procedures
- Well purging guidance for groundwater samples
- Sampling methods
- Chain of custody and sample handling procedures
- Record keeping
- QA/QC guidelines

Parameters to be tested for include TDS, pH, temp, nitrate-N, chloride, TKN, ...

Conclusion to Characterization

With the completion of site-specific characterization, final monitoring and test plans will be prepared. This monitoring and test plans will be based on the results of the characterization effort which includes the generation of a site conceptual groundwater flow model that describes

probable aquifer conditions, suprabasalt aquifer water level(s) and groundwater flow direction(s) (including seasonal variations), and discharge points for recharge water.

Preliminary Site-Specific Surface Water and Groundwater Monitoring Plan

Monitoring for the proposed testing is designed to meet four basic objectives. These are to identify: (1) changes in the natural system caused by factors other than those related to testing, (2) changes in the natural system caused by the testing (track the test performance), (3) potential problems caused by the testing that may require termination of the test and/or mitigation actions, and (4) events that effect test operations, such as a freezing event. To meet these objectives, the results of site-specific characterization will be used to identify monitoring locations to track:

- Source water quality and volume coming onto the test site
- Up-gradient groundwater water quality
- Groundwater level changes migrating into the test area in order to provide the information needed to differentiate the effects of testing from other effects on the test site.
- Down-gradient groundwater quality and levels, both near and distal to the test site
- Surface water discharge and quality changes

Monitoring data collected at these points during testing will be evaluated against the established baseline to identify testing effects on the surrounding environment, differentiate those effects from others in the environment, and identify when changes in test operations appear necessary.

Four basic types of monitoring points are currently proposed, source water, test site groundwater, distal groundwater, and surface water (e.g., springs). Considerations for each are summarized below:

- Source water monitoring will be at the point of diversion onto the site. Sampling frequency will be periodic. For water quality, sampling frequency will be based on an analysis of characterization data that identifies when contaminants (if any) are likely to be present in the source water. The results of source water quality monitoring will be used to determine if modifications to test operations are warranted. The volume of water delivered to the test site and leaving the test site (via a return line to the Canal) also will be monitored to keep track of the volume of water that infiltrated into the ground via the ponds. During testing different sampling frequencies may be tried to identify those that are most effective.
- Site groundwater monitoring, consisting of water quality and level data, will be at monitoring wells established immediately adjacent to the test site to identify immediate quantity and quality impacts from testing. Up-gradient monitoring will be a part of this so that site impacts can be differentiated from offsite events. Sampling frequency will be determined from characterization data and modified as more is learned during testing.

- Distal groundwater monitoring, consisting of water quality and level data, will be at monitoring wells more distal from the test site. This monitoring will be used to identify longer term quantity and quality impacts from testing. This includes the formation and migration of a groundwater mound and recharge water plume at, and away from, the test site, towards intended and unintended receptors. Up-gradient monitoring will be a part of this so that testing effects can be differentiated from offsite events. Sampling frequency will be determined from characterization data and modified as more is learned during testing.

- Surface water monitoring, most likely in spring creeks, will be done to identify the effects of recharge on spring flow. This monitoring will include the collection of both water quality and flow parameters. As with groundwater monitoring, surface water monitoring will need up-gradient monitoring information so that effects unrelated to test site operations/testing can be differentiated from those due to testing. This monitoring will likely include a combination of flow volume and water quality.

Four basic elements are needed for the monitoring plan. These are summarized below and will be developed in greater detail following the collection of site-specific characterization data. The four basic monitoring plan elements are:

1. Identification of monitoring points and sampling frequency
2. Description of sampling procedures, including:
    a. Equipment to be used
    b. Water level measuring techniques
    c. Stream gauging techniques
    d. Sampling equipment decontamination
    e. Well Purging
    f. Field parameters to be collected at both surface and groundwater sites
    g. Sample collection methods at both surface and groundwater sites
    h. Chain of custody tracking
    i. Sample handling protocols
    j. Field record keeping
    k. QA/QC
3. Sampling point maintenance
4. Data Reporting and Analysis, including:
    a. Record keeping

b. Annual reporting, including review of previously collected data, reporting of unusual events, and guidelines for recommending changes to test operations as a result of data analysis

This monitoring plan outline will be expanded upon following the collection of site-specific hydrogeologic characterization data.

Preliminary Test Site Operation Plan

In addition to the monitoring plan, a test plan will need to be developed. The test plan should describe how the test site will be operated during testing. Elements included in the test plan will include: (1) site construction, (2) test operations, (3) mitigation activities, and (4) reporting. The test plan will be developed prior to the start of actual testing. However, completion of the plan is contingent on funding. Assuming funding for the project can be procured, construction planning elements would be completed in the Autumn of 2003.

The contents of each test plan element are outlined below:

1. Site construction information describes the site layout. Site construction planning will include:

    a. Test Site survey and layout

    b. Specifications for pits/basins/ponds used for infiltration

    c. Water supply design (including diversion from canals if appropriate)

    d. Monitoring points (both on and off site)

    e. Site access controls (fences, etc.)

2. Test Operations will describe how the site will be used during the test. The operations plan will also describe provisions for changing the test operation plan as new data and information is collected during the test. The test operation plan will include:

    a. Test timing, including timing of recharge and monitoring frequencies

    b. Quantities of water used

    c. Outside influences that effect test, including weather (probably freezing), river flooding, trip wires for identifying potential offsite impacts before they occur so they can be mitigated and or testing suspended to prevent worsening conditions

    d. Responsible parties for diversion and delivery of water, operation of test, monitoring, and data review

    e. Permissions required to access offsite monitoring points

3. Mitigation - As stated above, one of the objectives of monitoring is to identify likely unintended consequences of recharge before they occur. If the precursors to these

consequences, such as changing water quality detrimental to aquatic habitat or groundwater levels rising to close to the surface in areas where shallow groundwater is not desired, can be detected soon enough via monitoring, recharge activities will be modified and/or terminated to mitigate against these effects. The mitigation plan will describe what the undesirable consequences of the test are, how they will be detected, and how the testing will have to modified to mitigate against these undesirable effects.

4. Reporting - Data and observations collected during testing, including monitoring data, will be compiled into reports. The basic objective of these reports will be to describe what was done during the test, what was observed at the monitoring points, interpret the data collected, and recommend changes to testing, monitoring, and mitigation plans. We anticipate that these reports will be produced annually. However, in cases where monitoring reveals the presence of an undesired effect from testing, the operator will need to immediately report the monitoring information to WRD and implement any required mitigation actions. At the conclusion of testing a final report will be prepared that describes the project, data colleted during operation and monitoring, interpretations of who well the recharge project worked in achieving project goals, and recommendations for future operations.

Oregon
Theodore R. Kulongoski, Governor

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October 30, 2008

Mr. Robert Bower
810 S. Main Street
Milton-Freewater, Oregon 97862

UIC Registration for: Infiltration recharge galleries at 84140 Prunedale Road, in Milton-Freewater.

Dear Mr. Bower:

Thank you for submitting a registration form for the Underground Injection Control (UIC) systems at your site. The following table shows your UIC identification number, combined with the injection system information you submitted. Generally, each facility is issued one UIC number; the various injection systems for that facility are then identified sequentially -1, -2, -3, etc. Please reference this number in future correspondence, and retain this letter, or a copy of it, on site, should your UIC systems be inspected.

UIC #	*Type Code*	*Status*	*Location*
13233-1	5R21	New infiltration gallery, natural backfill	southern
13233-2	5R21	New infiltration gallery, clean gravel backfill	south-central
13233-3	5R21	New infiltration gallery, Atlantis Rain Tank	north-central
13233-4	5R21	New infiltration gallery, Stormtech chambers	northern

Please note that you are required to do the following:

- Update registration information whenever a change of ownership, change of land use, modification, abandonment or closure of your injection system takes place. If ownership for your UIC systems changes, notify the next owner and DEQ about the registered injection system.
- Maintain and operate each injection system to protect groundwater resources.
- This authorization is for Walla Walla River recharge water only. It does not include runoff or leakage from a dumpster, loading dock, waste or material storage areas or from construction activities, wash water, process water, fueling areas or waste water discharges.
- Rule authorization will be revoked and a permit required if this site is found to be inside the delineated 2-year time of travel for a municipal well.

In the event a substance is spilled which may contaminate groundwater, contact the DEQ Eastern Region office (541) 388-6146, and call Oregon Emergency Management at (503) 378-6377 or (800) 452-0311.

Based on the information you have sent to DEQ, your injection system has qualified as rule authorized under OAR 340-44. Please check with your local government to see if they have additional requirements.

If you have any questions about this letter, please contact me at (503) 229-6371, or toll free inside Oregon at 1-800-452-4011.

Sincerely,

David Cole

David Cole, UIC Hydrogeologist
Water Quality Division

Cc: Eric Nigg, DEQ-ER
Phil Richerson, DEQ-ER

www.wwbwc.org
Walla Walla Basin Watershed Council
541-938-2170 or 7086 P.O.Box 68, Milton-Freewater, OR 97862

WWBWC-HBDIC's Infiltration Gallery Testing Project

In support of

UIC Permit Application to ODEQ

9/9/2008

Bob Bower
Hydrologist *MS-Eng.*

Table of Contents

Table of Contents 2
Introduction 3
Overview of HBDIC Recharge Project: Five years of Operations 5
HBDIC Recharge Site Water Quality Monitoring (2004-2008) 6
2004-2008 HBDIC Recharge Water Quality Results 7
Infiltration Gallery Study Plan 8
Research Objectives 9
Operations and Additional Monitoring 9
Summary 10

Introduction

The Walla Walla Basin Watershed Council (WWBWC) along with its project partners the Hudson Bay District Improvement Company (HBDIC) currently operate a shallow aquifer recharge site in the Walla Walla basin located in Umatilla County, Oregon (Figure 1). The site has been in operations since 2004 utilizing an Oregon Water Resources Department (OWRD) limited testing license[1] (Final Order #758). The site currently utilizes a series of spreading basins to recharge non-irrigation season water from the Walla Walla River into the shallow aquifer system (Figure 2). This project has been shown to effectively recharge the shallow aquifer to offset declining storage as well as help restore springs that feed streams in the Little Walla Walla River system. During the first five seasons of operation, water quality for this site has been tested by way of a monitoring program approved by ODEQ[2] during the original limited license application process (WWBWC, 2003). Results from this program has shown that source water quality recharged-at the sites has been of acceptable quality; meeting the standards established for this project by ODEQ staff.

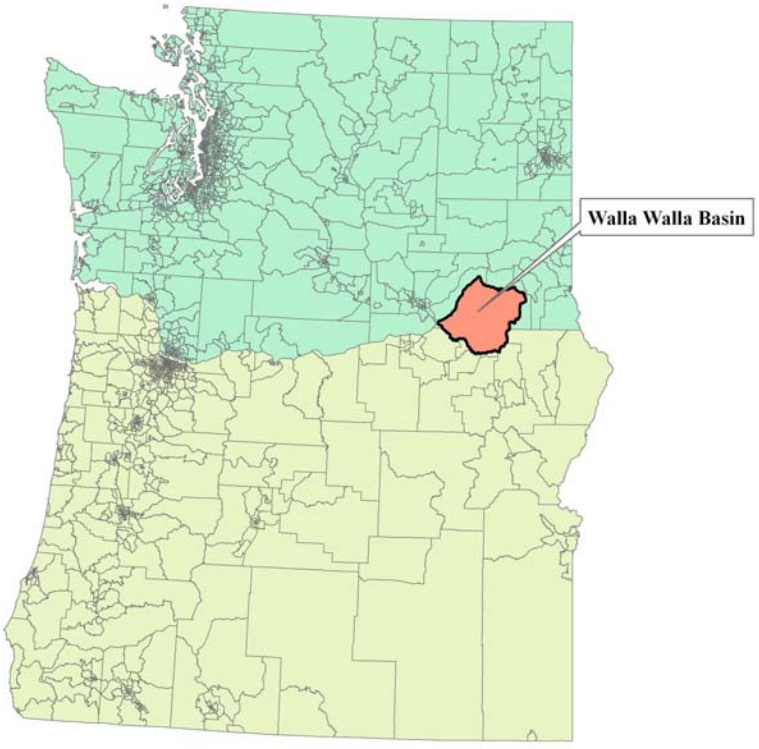

Figure 1. Walla Walla basin locater map, HBDIC Recharge site in Umatilla County.

[1] OAR 690-350-0020
[2] Phil Richerson, ODEQ, Pendleton Office. Phil.Richerson@state.or.us, 541-278-4604

Figure 2. Spring 2008 Photo of HBDIC Recharge Project spreading basins.

While spreading or infiltration basins are well established recharge method, they are not always the best solution for varying field and conservation project conditions. One such example of their limitations would be in the steeply rising land costs associated with the Walla Walla wine industry. The cost of fallow-agriculture ground that could be purchased and transformed into a spreading basin site for recharge has skyrocketed in recent years, making sites like the HBDIC location difficult to secure. Walla Walla basin water managers are therefore looking to develop aquifer recharge capabilities that can be used in and along right-of-way of ditch easements or small corner locations that are often owned by the district or its irrigator patrons.

Ideally, infiltration galleries coupled with a lined/piped deliver system could provide conservation during the times of scarcity (irrigation season) and aquifer recharge and storage during the times of water abundance (fall-winter-spring) without requiring large open tracks of land for infiltration basins. With careful water quality monitoring in place, the WWBWC-HBDIC recharge team would like to test various infiltration gallery designs in order to further develop this tool for our basin. The following study plan outlines the objectives and research outline for the testing of an infiltration gallery system at the HBDIC site. It is intended as supporting information to the WWBWC-HBDIC Underground Injection Control (UIC) permit application.

Overview of HBDIC Recharge Project: Five years of Operations

The Hudson Bay Aquifer Recharge project was designed to test aquifer recharge as a tool to stabilize and restore declining aquifer levels and spring-creek flows in the Walla Walla River valley. Funding, technical-support and permitting has been provided by the Oregon Watershed Enhancement Board (OWEB), Walla Walla Watershed Alliance (NRCS funds), Oregon Water Resources Department (OWRD), Oregon Department of Environmental Quality (ODEQ), Oregon State University Extension, HBDIC and the WWBWC.

The Hudson Bay Aquifer Recharge Project has been operated successfully for five consecutive recharge seasons starting in 2004 through 2008. The current test project is operated under a Limited License Request (#758) from Oregon Water Resources Department. The conditions and limitation of the permit state:

"The use of water from the Walla Walla River shall be limited to 50 cfs for the purpose of testing artificial ground water recharge during a testing season of November 1 through May 15. Water may only be diverted when there is adequate flow in the Walla Walla River to honor all existing water rights. When water is diverted under this limited license, the use is further limited to times when there is, at a minimum, the following stream flows in the Tum a lum reach of the Walla Walla River, between the Little Walla Walla River diversion and Nursery Bridge Dam and flowing past Nursery Bridge Dam: November – 64 cfs, December and January – 95 cfs, February to May 15 – 150 cfs."

The project currently consists of a series of four spreading basins (Figure 1) that utilize water delivered from the Walla Walla River via the HBDIC's ditch system to operate the site. The current total infiltration area of the basins is 1.25 acres with an estimated on-site infiltration rate of between 13-18 cfs. In the 2006-2007 recharge seasons, the best to date, the project recharged approximately 3,300 acre-feet in 132 days of operation.

The project also has an extensive surface and groundwater monitoring system associated with in that measure onsite conditions (Figure 3) as well as more distal downgradient and surrounding locations (Figure 4). Water level monitoring, geology, surface flow and spring discharge and a battery of water quality samples are taken to monitor and assess the HBDIC recharge project. There are four on-site dedicated observation wells where water quality and groundwater levels are monitored (OBS 1, 2, 3 and 4). Well logs for observation well #3 (closest to new infiltration gallery) and Observation well #1 (water quality monitoring well, 4" casing) can be found in Attachment 2. Water levels in these wells range seasonally depending on local groundwater use and when the HBDIC site is in operations. Well OBS #3 ranges from 25 feet below ground surface (bgs) during recharge operations to 60 feet bgs (WWBWC data).

Several reports review the monitoring system at the HBDIC project including:

- *Hudson Bay Aquifer Recharge Project: An application for ASR Testing Limited License to Oregon Water Resources Department (OWRD) (OAR 690-350-0020), and attachments*. October, 2003. Bower, ET. al. WWBWC
- *Hudson Bay Aquifer Recharge Testing Project: 2004 Annual Report*. November 2004. Bower. WWBWC
- *Hudson Bay Aquifer Recharge Testing* Project: 2004-5 Annual Report. November 2005. Bower. WWBWC
- *Hudson Bay Aquifer Recharge Testing Project*: 2004-2008 Review Report, November 2008. Bower, et. al., WWBWC.

As the compilation report is still being completed (due November 2008) a review of all the project data and analysis is not available at this time. However, in support of this application for a HBDIC infiltration gallery UIC permit, the next section will review what is the most relevant to support the WWBWC UIC permit application: the water quality monitoring we have done during the first five recharge seasons. This will provide the ODEQ UIC review staff with the pertinent information by which to assess the attached application.

HBDIC Recharge Site Water Quality Monitoring (2004-2008)

As the HBDIC Recharge Project represented the first of its kind in the State of Oregon, water quality sampling has been a priority monitoring focus since the conception. DEQ and WWBWC staff developed the parameters and testing protocols for this project during the original application process in 2003-4 (*Hudson Bay Aquifer Recharge Project: An application for ASR Testing Limited License to Oregon Water Resources Department (OWRD) (OAR 690-350-0020), and attachments*).

To summarize the program and the results from the past water quality monitoring it is best to separated sampling into two categories and list of constituents.

- **Baseline:**
  - nitrate
  - total kjeldahl nitrogen (TKN)
  - total dissolved solids (TDS)
  - chemical oxygen demand (COD)
  - chloride
  - orthophosphate
  - fecal coliform bacteria

- **Soluble Organic Compounds – Pesticides**

(Common/Trade names, EPA Drinking Water Method)

  - 2,4 D acid, Dacamine, 515.1
  - Dimethoate, Cygon, 525.2

- Metalaxyl, Ridomil, 525.2
- Napropamide, Devrinol, 525.2
- Simazine, Princep, Aquazine, 525.2
- 1-Naphthaleneacetamide, Amid-thin 525.2
- Diazinon, Diazinon, 525.2
- Fenarimol, Rubigan, 525.2
- Lindane, Lindane, 525.2
- Methidathinon, Supracide, 525.2
- Mevinphos, Phosdrin, 525.2
- Myclobutanil, Systhane, Rally 525.2
- Triflumizole, Procure, 525.2
- Azinphos-methyl, Guthion, 525.2
- Carbaryl, Sevin, 531.1
- Chlorpyrifos, Dursban, Lorsban, 525.2
- DDD (TDE) Rhotane, DDD, 525.2
- DDE degradation product, 525.2
- DDT Anofex, Gesarol, 525.2
- Dicofol, Kelthane, 525.2
- Malathion, Cythion, 525.2
- Methyl Parathion, Penncap, 525.2
- Phosmet, Imidan, 525.2
- Propargite, Omite, Comit, 525.2
- Triadimefon Dimethoate, Bayleton, 525.2
- Oxamyl, Vydate, 531.1
- Hexazinone DPX 3674, Pronone, and Velpar, 525.2
- Parathion-Ethyl, Niran, Phoskil (56), 525.2

These Soluble Organic Compounds (SOCs) were determined through a collaborative assessment process that involved the WWBWC, Oregon State Extension and the ODEQ to be the focus of the HBDIC recharge monitoring project. In additional to the SOC analytes listed above, there were additional compounds tested as reported by the standard EPA drinking water standard testing 508.1, 515.1, 525.2, and 531.1, a list of these compounds can be found in Attachment 1.

2004-2008 HBDIC Recharge Water Quality Results

The HBDIC Recharge project monitoring team and ODEQ have developed the monitoring program as an iterative process. More than 85 different SOC analytes have been tested at the site's source (surface) and groundwater monitoring locations during the five years of operations. The baseline chemistry results for site groundwater and source water are summarized in Table 1.

Table 1. HBDIC Baseline Chemistry Results (2004-2008)

Water Sample Sites: Ground/Surface	Analyte	Minimum	Maximum	Average	Units
Groundwater	Chloride	ND	0.8	0.6	mg/L
Groundwater	Chemical Oxygen Demand	ND	55.0	24.1	mg/L
Groundwater	Nitrate as Nitrate as Nitrogen	0.1	0.6	0.2	mg/L
Groundwater	Orthophosphate as P	ND	0.5	0.3	mg/L
Groundwater	TKN as Nitrogen	ND	1.6	ND	mg/L
Groundwater	Total Dissolved Solids	ND	84.0	61.2	mg/L
Surface	Chloride	ND	1.0	0.8	mg/L
Surface	Chemical Oxygen Demand	ND	21.0	ND	mg/L
Surface	Nitrate as Nitrogen	ND	0.5	0.2	mg/L
Surface	Orthophosphate as P	0.1	0.6	0.3	mg/L
Surface	TKN as Nitrogen	ND	ND	ND	mg/L
Surface	Total Dissolved Solids	ND	76.0	57.4	mg/L

ND - No Detection

**Data source: WWBWC, 2008.*

Fecal Coliforms were detected in both the source and groundwater monitoring sites. Additional monitoring was conducted at the HBDIC site as well as in other, more distal locations. The results indicated that low level fecal coliform detections were prevalent in many area surface and groundwater locations leading the monitoring team to determine fecal contamination to be a prevalent background condition (Table 2.)

Table 2. Surface and Groundwater Monitoring Fecal Coliform Results

	Surface			Groundwater			
Recharge Sampling Year	Minimum	Maximum	Average	Minimum	Maximum	Average	Units
2004	1.0	130.0	39.8	0.0	14.8	3.8	MPN/100 ML
2004-5	0.0	62.0	9.4	0.0	12.0	2.0	MPN/100 ML
2005-6	14.0	20.0	17.0	0.0	3.0	1.0	MPN/100 ML
2006-7	7.0	23.0	15.3	0.0	3.0	1.0	MPN/100 ML
2007-8	11.0	14.0	12.5	0.0	1.0	0.5	MPN/100 ML

**Data source: WWBWC, 2008.*

Pesticide or Soluble Organic Compounds sampling resulted in only **a single detection** in the 5 years of monitoring. On April 13, 2004 at the HBDIC Observation well #1, Di(ethylhexyl)-phthalate was detected at 2.2 ug/L. The Maximum Contaminant Level MCL for this compound is 6.0 ug/L according to EPA standards (2004). ODEQ staff concluded that this was likely a low-level detection arising from the newly installed PVC observation-well casing. The compound was not detected in subsequent monitoring of the recharge project's surface or observation sites.

Infiltration Gallery Study Plan

The WWBWC has been collaborating with other national and international recharge programs that are also seeking to improve designs for infiltration galleries for aquifer recharge purposes. After reviewing the available literature and discussing the main issues with our collaborative partners, we put together an infiltration gallery testing project for the

HBDIC site. The project will include four infiltration galleries each with different types of gallery materials. Each of these galleries will also include flow meters (to determine flow rate into each), and inspection ports where each can be checked for sediment accumulation and cleaned and maintained. The project will generally be run the same as the rest of the HBDIC recharge site between November 1sth and May 15th. A turbidity meter will also be installed and operated during the testing of the galleries to provide background information as to better understanding any clogging that may occur. The objectives of the study are as follows:

Research Objectives

- Determine most effective infiltration gallery design and materials in recharging water subsurface in the Walla Walla basin.
- Determine rates of infiltration and any potential clogging of each of the four test infiltration gallery designs.
- Test varies methods to clean infiltration galleries if clogging to decreases performance.
- Monitor surface and groundwater for quality and quantity changes related to operation of infiltration galleries.

Project Designs

Site designs for the infiltration galleries testing project (Upper Recharge Project) and site plans are included in Attachment 2 (Plates 1 through 7).

- **Plate 1** covers the original survey of the HBDIC recharge site before any of the spreading basins were build and the basic geologic information provided by the test pits (2003).
- **Plate 2** provides an overview of the entire HBDIC recharge site with four existing spreading basins and the new infiltration gallery testing project.
- **Plate 3** provides miscellaneous details as to the White Ditch inlet structure as well as inspection port and flow meter placements.
- **Plate 4** provides information for two of the four infiltration gallery designs. The designs outline the piping and the location of inspection ports and flow meters.
- **Plate 5** provides the layout and design information for the Atlantis Rain Tank (style of piping) and the Stormtech Chamber designs.
- **Plate 6** provides the design information for the check and screen structure that will divert the water from the ditch into the project.
- **Plate 7** provides general construction details for the check structure construction.

Operations and Additional Monitoring

The HBDIC Infiltration Gallery Testing Project will be operated by the instructions outlined in our OWRD/ODEQ-approved Limited Testing License. Water will be diverted to the infiltration galleries at the volumes and dates outlined in our current permit. The project has been designed to operate at approximately four cfs: one cfs for each of the four infiltration

gallery designs. All water quality monitoring will be conducted as instructed in our current license. However the WWBWC will conduct the following additional testing in order to gather information relative to our four project objectives:

- **YSI Continuous Turbidity Meter Model # 6920 V2**[3] will be installed in the check structure piping that delivers the water to the four infiltration galleries.
- **Water Quality Samples: Total Suspended Solids (TSS)** will be collected weekly during recharge operations and sent to Edge Analytical[4] in order to establish a TSS-Turbidity regression relationship. This will be used with flow information to determine any correlation between source water turbidity with infiltration gallery performance (clogging).
- **Water Quality Samples: Total Organic Carbons** (**TOC**). Studies at the Orange County Aquifer Recharge Program[5] have shown biological clogging decrease infiltration-gallery performance. While the fall-winter-spring water temperatures at HBDIC make this issue unlikely, we will collect TOC and TSS to confirm biological clogging will not have an effect.
- **1.5 Meter PVC piezometers** will be installed at each of the infiltration galleries at the midpoint at horizontal spacing of 0.5 and 1.5 meters. These capped piezometers will provide us with water-level mounding information in the close vicinity of the galleries. Water level measurements will be collected using an etape.
- **Aqua Master Model 900R (Jennings Inc.) or McCrometer Model EO3000 Propeller Style flow meters** will be installed to measure flow capacity of each of the four infiltration gallery designs. Four of the same type of recorder will be purchased.
- **Site groundwater level and water quality monitoring** will continue to be monitored at the HBDIC Observation wells #1, #2, #3 and #4 at the White Ditch check and intake structures.

Summary

The HBDIC Infiltration Gallery Testing Project will be subject to the site's current water quality monitoring program with additional monitoring of the four different recharge gallery designs. Monitoring over the first five years has shown that the source water at the HBDIC recharge project is acceptable for a UIC permit for operations. The testing of the project will cover at a minimum of two full recharge seasons, November 1st 2008 through May 15th, 2009 and November 1st 2009 through May 15th, 2010 in order to establish enough data to address the main research objectives for the project. Any further monitoring and/or design ideas that ODEQ or OWRD considers essential for the safe operations and testing of these galleries can be incorporated into this application.

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[3] https://www.ysi.com/ysi/Products/Product_Family/Product?productID=EMS_SEN02_6136

[4] http://www.edgeanalytical.com/

[5] Verbal communications with Adam Hutchinson, director of Orange County (CA) Aquifer Recharge Program. http://www.ocwd.com/Groundwater-Recharge/ca-34.aspx

Attachment 1: Additional SOC compounds tested 2004-2008

DOH#	Compounds	Results	Units	SRL	Trigger	MCL	Comments
	Carbamates in drinking water						
146	Carbofuran		ug/L	1.8	1.8	40.0	EPA Regulated
148	Oxymal		ug/L	4.0	4.0	200.0	EPA Regulated
141	3-Hydroxycarbofuran		ug/L	2.0	2.0		EPA Unregulated
142	Aldicarb		ug/L	1.0	1.0		EPA Unregulated
143	Aldicarb Sulfone		ug/L	1.6	1.6		EPA Unregulated
144	Aldicarb Sulfoxide		ug/L	1.0	1.0		EPA Unregulated
145	Carbaryl		ug/L	2.0	2.0		EPA Unregulated
147	Methomyl		ug/L	1.0	4.0		EPA Unregulated
326	Propoxur(Baygon)		ug/L	1.0			State Unregulated
327	Methiocarb		ug/L	4.0			State Unregulated
	Synthetic Organic Compounds						
33	Endrin		ug/L	0.02	0.02	2.0	EPA Regulated
34	Lindane (BHC-Gamma)		ug/L	0.04	0.04	0.2	EPA Regulated
35	Methoxychlor		ug/L	0.20	0.20	40.0	EPA Regulated
117	Alachlor		ug/L	0.40	0.40	2.0	EPA Regulated
119	Atrazine		ug/L	0.20	0.20	3.0	EPA Regulated
120	Benzo(a)pyrene		ug/L	0.04	0.04	0.2	EPA Regulated
122	Chlordane Technical		ug/L	0.40	0.40	2.0	EPA Regulated
124	Di(ethylhexyl)-Adipate		ug/L	1.30	1.30	400.0	EPA Regulated
125	Di(ethylhexyl)-phthalate		ug/L	1.30	1.30	6.0	EPA Regulated
126	Heptachlor		ug/L	0.08	0.08	0.4	EPA Regulated
127	Heptachlor epoxide (A & B)		ug/L	0.04	0.04	0.2	EPA Regulated
128	Hexachlorobenzene		ug/L	0.20	0.20	1.0	EPA Regulated
129	Hexachlorocyclo-Pentadiene		ug/L	0.20	0.20	50.0	EPA Regulated
133	Simazine		ug/L	0.15	0.15	4.0	EPA Regulated
118	Aldrin		ug/L	0.20	0.20		EPA Unregulated
121	Butachlor		ug/L	0.40	0.40		EPA Unregulated
123	Dieldrin		ug/L	0.20	0.20		EPA Unregulated
130	Metolachlor		ug/L	1.00	1.00		EPA Unregulated
131	Metribuzin		ug/L	0.20	0.20		EPA Unregulated
132	Propachlor		ug/L	0.20	0.20		EPA Unregulated
179	Bromacil		ug/L	0.20	0.20		State Unregulated
183	Prometon		ug/L	0.20	0.20		State Unregulated
190	Terbacil		ug/L	0.20	0.20		State Unregulated
202	Diazinon		ug/L	0.20	0.20		State Unregulated
208	EPTC		ug/L	0.30	0.30		State Unregulated
232	4,4-DDD		ug/L	0.20	0.20		State Unregulated
233	4,4-DDE		ug/L	0.20	0.20		State Unregulated
234	4,4_DDT		ug/L	0.20	0.20		State Unregulated
236	Cyanazine		ug/L	0.20	0.20		State Unregulated

Attachment 1: Additional SOC compounds tested 2004-2008 (Continued)

DOH#	Compounds	Results	Units	SRL	Trigger	MCL	Comments
	Synthetic Organic Compounds						
239	Malathion		ug/L	0.20	0.20		State Unregulated
240	Parathion		ug/L	0.20	0.20		State Unregulated
243	Trifluralin		ug/L	0.20	0.20		State Unregulated
96	Napthalene		ug/L	0.10	0.10		PAHs
154	Fluorene		ug/L	0.20	0.20		PAHs
244	Acenaphthylene		ug/L	0.20	0.20		PAHs
245	Acenaphthene		ug/L	0.20	0.20		PAHs
246	Anthracene		ug/L	0.20	0.20		PAHs
247	Benz(a)anthracene		ug/L	0.10	0.10		PAHs
248	Benzo(b)fluoranthene		ug/L	0.20	0.20		PAHs
249	Benzo(g,h,i)perylene		ug/L	0.20	0.20		PAHs
250	Benzo(k)fluoranthene		ug/L	0.20	0.20		PAHs
251	Chrysene		ug/L	0.20	0.20		PAHs
252	Dibenzo(A,H)anthracene		ug/L	0.20	0.20		PAHs
253	Fluoranthene		ug/L	0.20	0.20		PAHs
255	Indeno(1,2,3-CD)Pyrene		ug/L	0.20	0.20		PAHs
256	Phenanthrene		ug/L	0.20	0.20		PAHs
257	Pyrene		ug/L	0.20	0.20		PAHs
258	Benzyl Butyl Phthalate		ug/L	0.60	0.60		Phthalates
259	Di-N-Butyl Phthalate		ug/L	0.60	0.60		Phthalates
260	Diethyl Phthalate		ug/L	0.60	0.60		Phthalates
261	Dimethyl Phthalate		ug/L	0.60	0.60		Phthalates
36	Toxaphene		ug/L	2.0	2.0	3.0	PCBs/Toxaphene
173	Aroclor 1221		ug/L	20.0	20.0		PCBs/Toxaphene
174	Aroclor 1232		ug/L	0.5	0.5		PCBs/Toxaphene
175	Aroclor 1242		ug/L	0.5	0.3		PCBs/Toxaphene
176	Aroclor 1248		ug/L	0.1	0.1		PCBs/Toxaphene
177	Aroclor 1254		ug/L	0.1	0.1		PCBs/Toxaphene
178	Aroclor 1260		ug/L	0.2	0.2		PCBs/Toxaphene
180	Aroclor 1016		ug/L	0.1	0.1		PCBs/Toxaphene
	Herbicides in Drinking Water						
37	2,4-D		ug/L	0.2	0.2	70.0	EPA Regulated
38	2,4,5-TP (Silvex)		ug/L	0.4	0.4	50.0	EPA Regulated
134	Pentachlorophenol		ug/L	0.1	0.1	1.0	EPA Regulated
137	Dalapon		ug/L	2.0	2.0	200.0	EPA Regulated
139	Dinoseb		ug/L	0.4	0.4	7.0	EPA Regulated
140	Picloram		ug/L	0.2	0.2	500.0	EPA Regulated
138	Dicamba		ug/L	0.2	0.2		EPA Unregulated
135	2,4 DB		ug/L	1.0	1.0		State Unregulated
136	2,4,5 T		ug/L	0.4	0.4		State Unregulated

Attachment 1: Additional SOC compounds tested 2004-2008 (Continued)

DOH#	Compounds	Results	Units	SRL	Trigger	MCL	Comments
	Herbicides in Drinking Water						
220	Bentazon		ug/L	0.5	0.5		State Unregulated
221	Dichloroprop		ug/L	0.5	0.5		State Unregulated
223	Actiflorfin		ug/L	2.0	2.0		State Unregulated
225	Dacthal (DCPA)		ug/L	0.1	0.1		State Unregulated
226	3,5-Dichlorobenzoic Acid		ug/L	0.5	0.5		State Unregulated

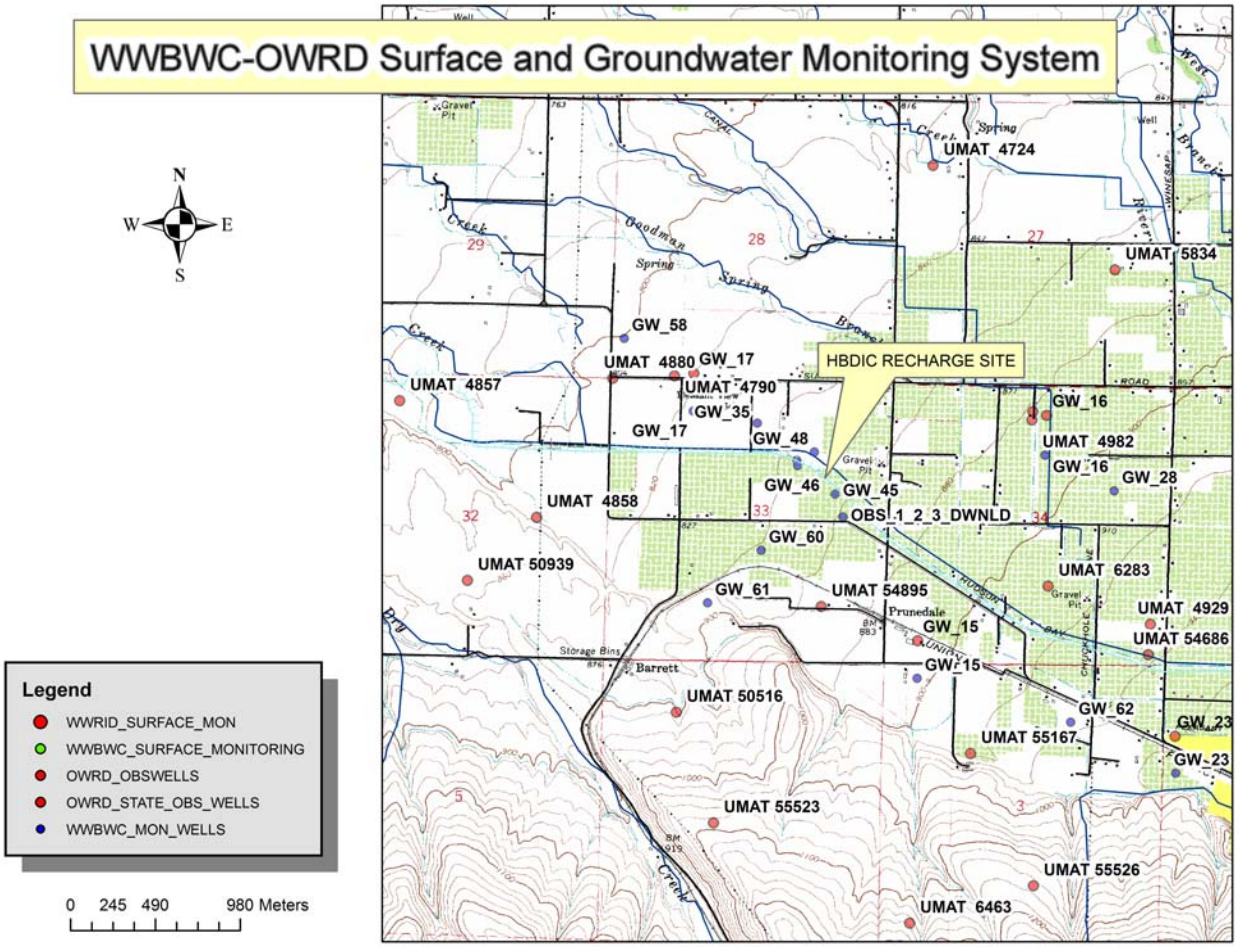
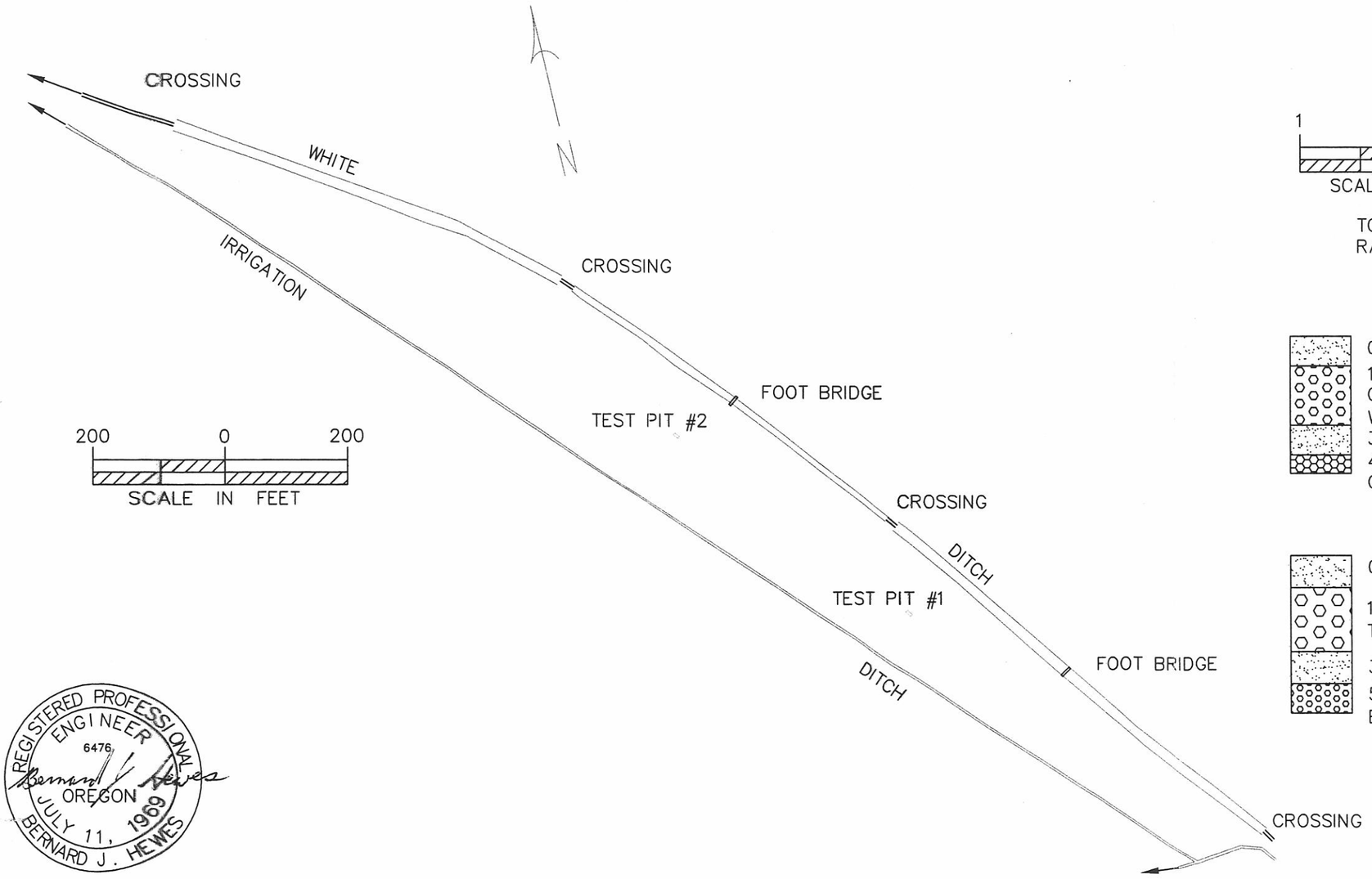
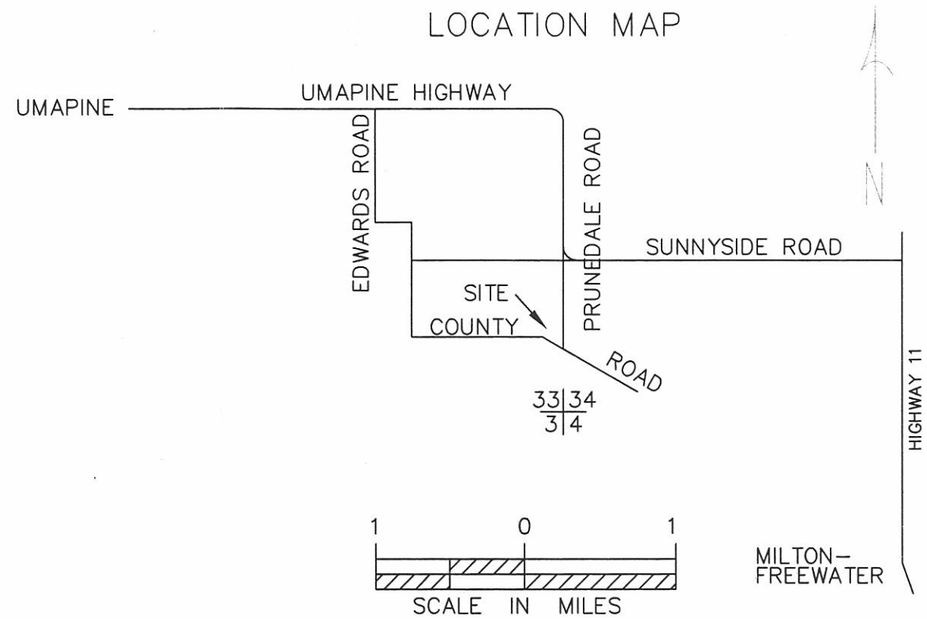


Figure 4. Map showing surface and groundwater monitoring locations relative to HBDIC Recharge Site.

SITE PLAN VIEW



LOCATION MAP



TOWNSHIP 6N
RANGE 35E

TEST PIT #1

0–12" SANDY LOAM

12"–36" GRAVELY SANDY LOAM, APPROX. 50% OF THE VOLUME IS GRAVEL SIZE PARTICLES WITH AN ESTIMATED D_{50} SIZE OF ABOUT 0.75".

36"–48" SANDY LOAM

48"–? GRAVELY SANDY LOAM APPROX. 20% OF THE VOLUME IS GRAVEL SIZE PARTICLES.

TEST PIT #2

0–13" GRAVELY SANDY LOAM

13"–39" COBBLY SANDY LOAM, THE D_{50} OF THE GRAVEL IS APPROXIMATELY 1"

39"–52" GRAVELY SANDY LOAM

52"–? SAND GRAVEL MIX D_{50} ESTIMATED TO BE ABOUT 0.25".

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

B. Hewes1/26/2007 11:35 AMwhitereloc.dwg

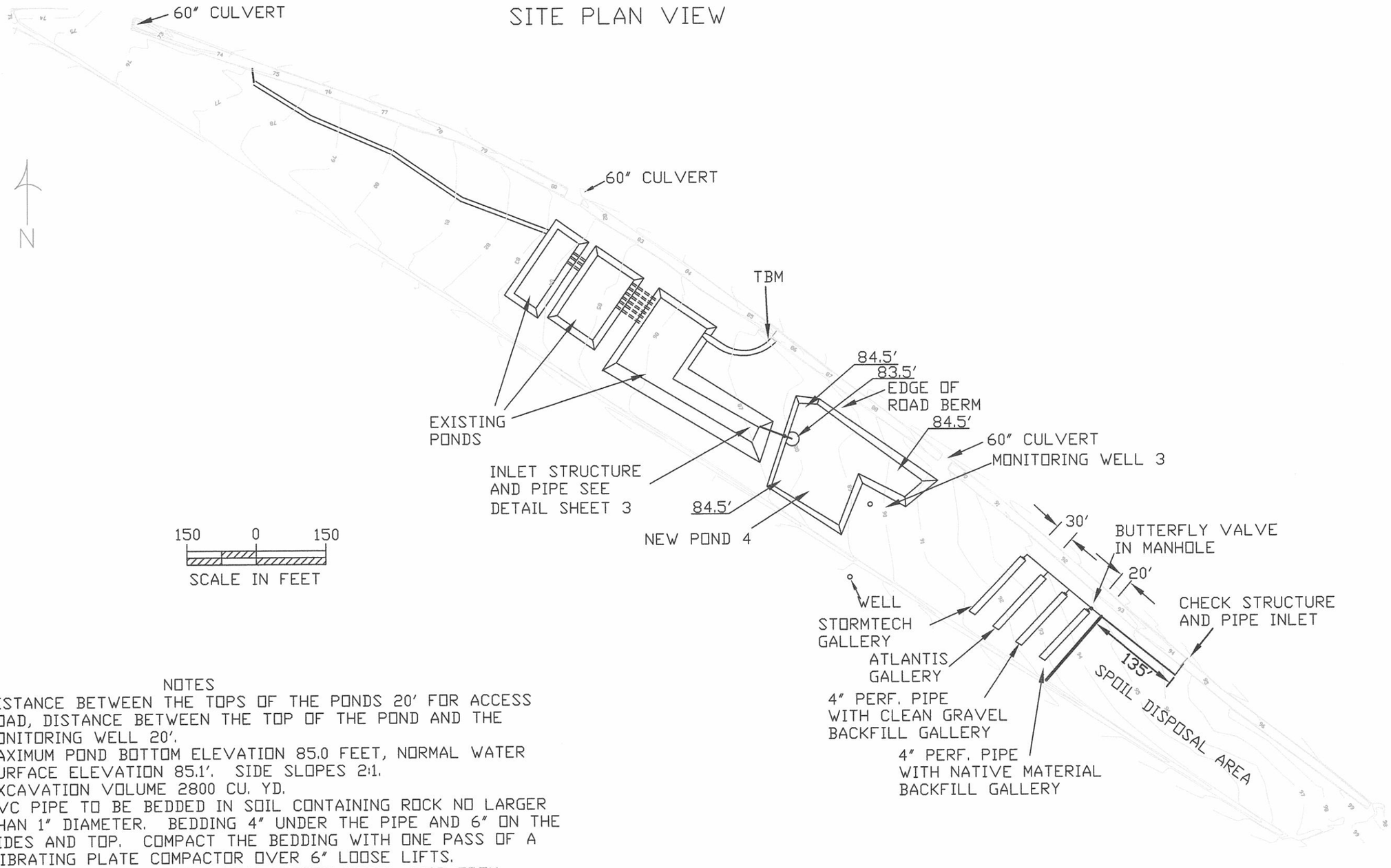
DATE
DESIGNED B.HEWES 4/03
PLOTTED
APPROVED

WWBWC/HBDIC UPPER RECHARGE PROJECT
SITE PLAN & LOCATION MAP
UMATILLA COUNTY, OREGON

CADFILE
whitereloc

SHEET 1
OF 7

SITE PLAN VIEW



NOTES

DISTANCE BETWEEN THE TOPS OF THE PONDS 20' FOR ACCESS ROAD, DISTANCE BETWEEN THE TOP OF THE POND AND THE MONITORING WELL 20'.
MAXIMUM POND BOTTOM ELEVATION 85.0 FEET, NORMAL WATER SURFACE ELEVATION 85.1'. SIDE SLOPES 2:1.
EXCAVATION VOLUME 2800 CU. YD.
PVC PIPE TO BE BEDDED IN SOIL CONTAINING ROCK NO LARGER THAN 1" DIAMETER. BEDDING 4" UNDER THE PIPE AND 6" ON THE SIDES AND TOP. COMPACT THE BEDDING WITH ONE PASS OF A VIBRATING PLATE COMPACTOR OVER 6" LOOSE LIFTS.
CONSIDER FLOW METERS: AQUA MASTER MODEL 900R FROM JENNINGS INC.
McCROMETER MODEL E0300 PROPELLER STYLE METER.
CHECK FOR COMPATIBILITY WITH YOUR EXISTING RECORDING AND CONTROL EQUIPMENT.
SPACE THE DIFFERENT KIND OF GALLERIES 30'.
TBM IS AT THE TOP OF THE RIGHT SIDE WALL, DOWNSTREAM END OF THE FLUME. ELEVATION 88.7 FEET.

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

B. Hewes 8/21/2008 11:59 AM whiteex-tpln2.dwg

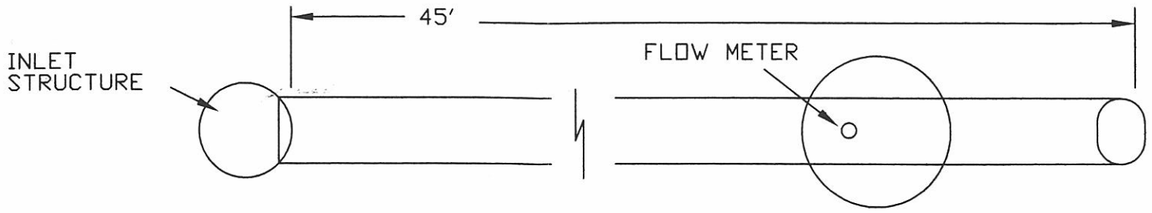
DATE
DESIGNED B. HEWES 11/07
PLOTTED
APPROVED

WWBWC/HBDIC UPPER RECHARGE PROJECT
SITE PLAN
UMATILLA COUNTY, OREGON

CADFILE
whitextpln2

SHEET 2
OF 7

SUPPLY PIPE TO POND 4 PLAN VIEW



NOTES

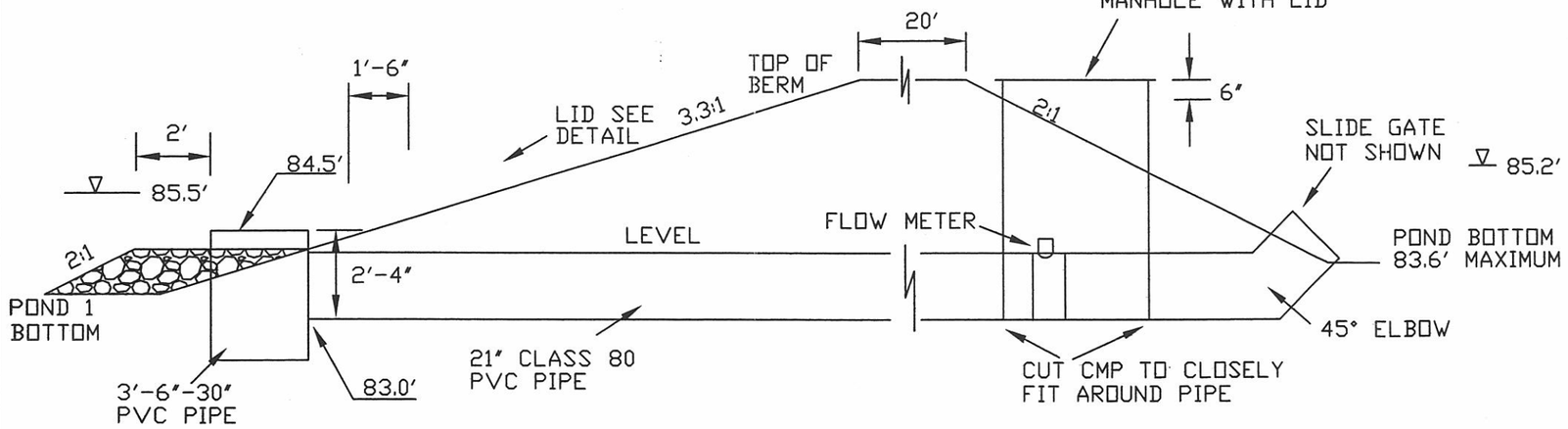
CUT THE HOLE IN THE INLET STRUCTURE TO CLOSELY FIT AROUND THE SUPPLY PIPE. FILL THE SPACE BETWEEN THE STRUCTURE AND PIPES WITH CAULKING ON BOTH SIDES.

THE BOTTOM LIP OF THE 45° ELBOW CAN BE NO LESS THAN 0.2' BELOW THE TOP OF THE 21" PIPE.

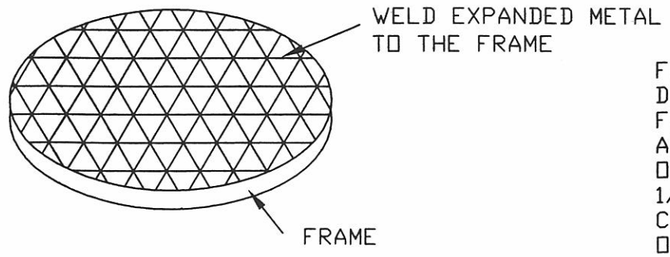
LID FOR THE CMP MANHOLE TO BE GALVANIZED $\frac{1}{8}$" THICK STEEL.

SLIDE GATE TO BE A WATERMAN C-8-4 OR EQUIVALENT. INSTALL A CATWALK FOR ACCESS TO THE SLIDE GATE.

SIDE ELEVATION VIEW TYPICAL

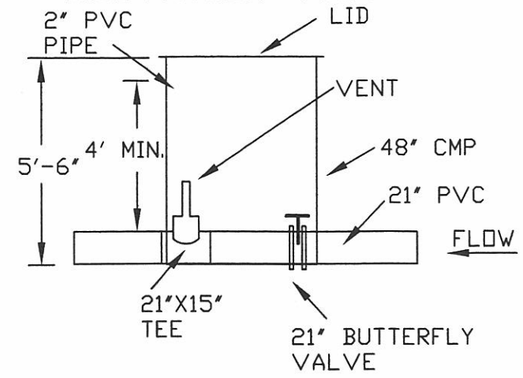


INLET STRUCTURE TRASH RACK DETAIL PERSPECTIVE VIEW

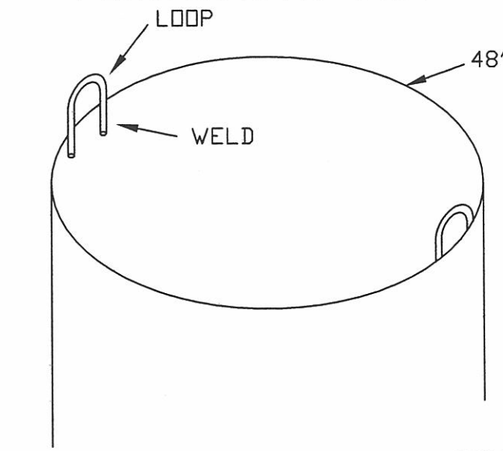


FRAME IS $\frac{1}{8}$" X 3" STEEL, INSIDE DIAMETER 32". COVER TO BE FLATTENED EXPANDED METAL APPROXIMATELY 0.120" THICK; OPENINGS APPROXIMATELY 1/2" X 1 5/8 ". CLEAN AND PAINT WITH 2 COATS OF HIGH ZINC COLD GALVANIZING PAINT.

GALLERY SUPPLY PIPE VALVE DETAILS ELEVATION VIEW



MANHOLE LID HOLD DOWN PERSPECTIVE VIEW



USE 1/2" DIAMETER ROD TO MAKE LOOPS. DIAMETER OF THE LOOP 2"

EXPIRES 6/30/2009

B. Hewes 12/11/2007 10:31 AM whitemisc.dwg

DESIGNED B. HEWES DATE 11/07

CHECKED

APPROVED

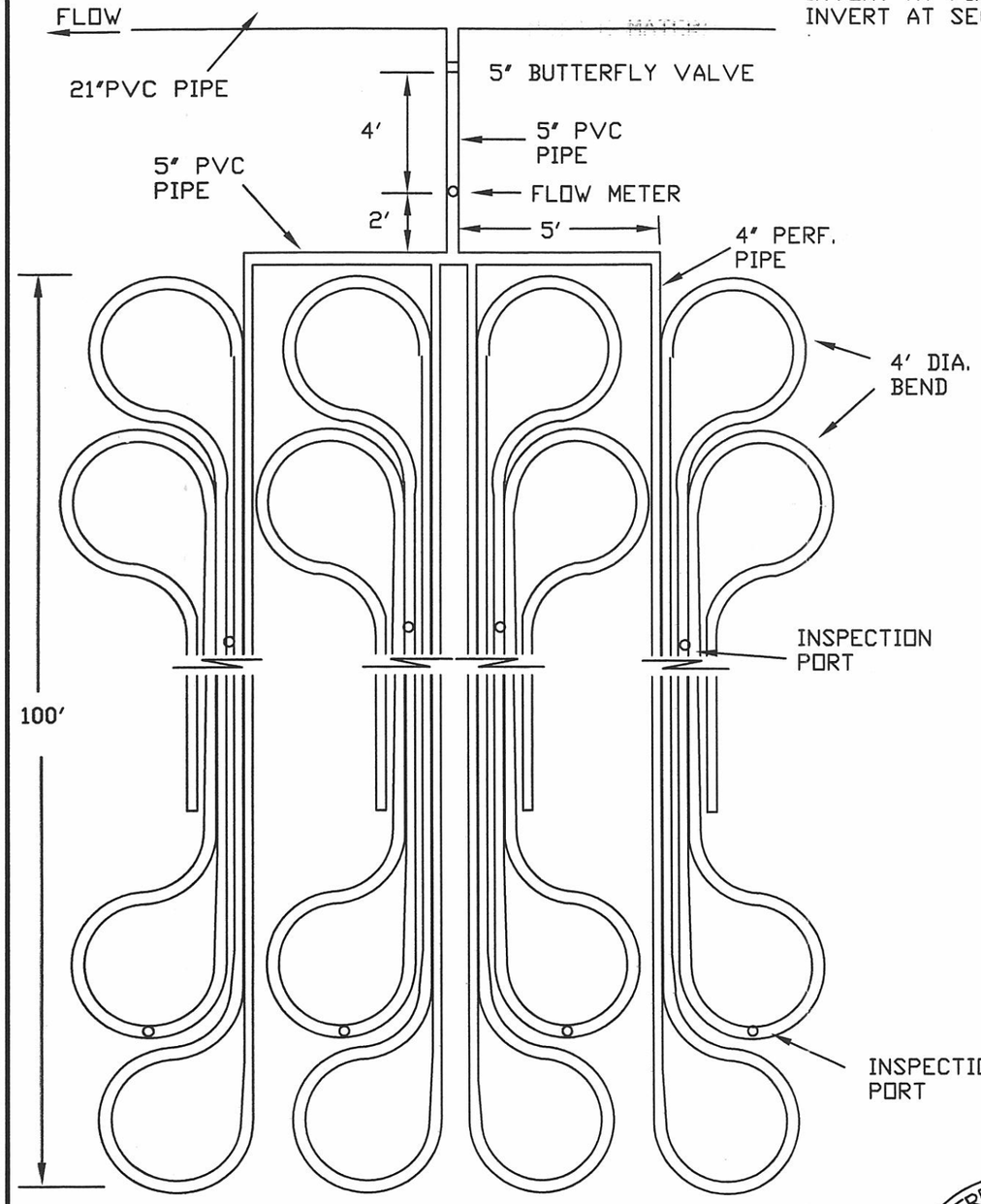
WWBWC/HBDIC UPPER RECHARGE PROJECT
MISCELLANEOUS DETAILS
UMATILLA COUNTY, OREGON

B H ENGINEERING

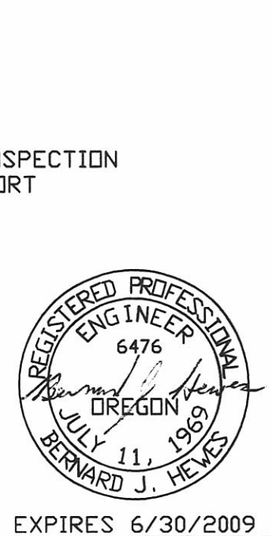
CAD FILE whitemisc

SHEET 3 OF 7

TYPICAL 4" PERFORATED PIPE GALLERY
PLAN VIEW

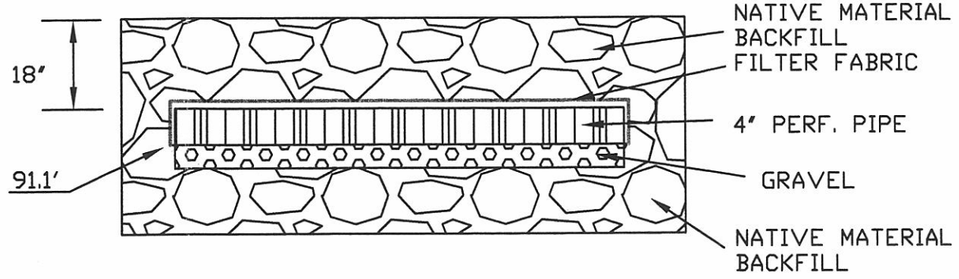


NOTE: ON THIS SIDE THE PERF. PIPE CHANGED TO SMOOTH DRAIN FIELD PIPE WITH A TEE FOR EACH PIPE ROW, 20 ROWS.



EXPIRES 6/30/2009

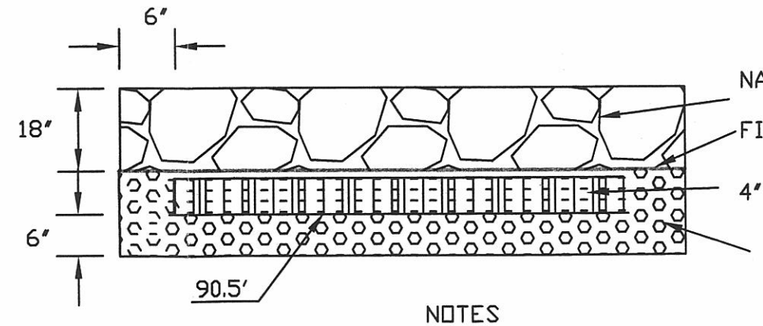
4" PERFORATED PIPE WITH NATIVE MATERIAL BACKFILL
ELEVATION VIEW



NOTES

NEED 2000' OF ADS 4" SINGLE WALL, PERFORATED, CORRUGATED POLYETHYLENE PIPE OR EQUIVALENT. CONNECT THE 4" TO THE 5" PIPE USING A MAR-MAC POLYSEAL PIPE COUPLER OR EQUIVALENT.
USE ONLY ENOUGH GRAVEL BEDDING TO PROVIDE A SMOOTH SURFACE TO LAY THE PIPE ON OR REMOVE ALL ROCK GREATER THAN 2" IN DIAMETER FROM CONTACTING THE PIPE.
THE INSPECTION PORT TO BE INSTALLED WHERE THE TWO PIPE ROLLS CONNECT AND NEAR THE END AS SHOWN. CONNECT THE ROLLS WITH A 4" TEE, USE 2' OF VERTICAL 4" PERF. PIPE WRAPPED WITH FILTER FABRIC FOR AN INSPECTION PORT. INSTALL A 4" CAP ON THE END OF THE PIPE AND INSPECTION PORT.
THE FILTER FABRIC TO BE ADS 4000 NONWOVEN OR EQUIVALENT. ABOUT 75 SQ. YD. NEEDED.

4" DRAIN FIELD PIPE WITH GRAVEL BEDDING
ELEVATION VIEW



NOTES

NEED 2000' OF 4" PVC DRAIN FIELD PIPE. CONNECT THE 4" TO THE 5" PIPE USING A MAR-MAC POLYSEAL PIPE COUPLER OR EQUIVALENT.
THE INSPECTION PORTS TO BE INSTALLED NEAR THE MIDDLE OF ONE OF THE ROWS AND NEAR THE END. USE 2' OF VERTICAL 4" PIPE WRAPPED WITH FILTER FABRIC FOR AN INSPECTION PORT. INSTALL A 4" CAP ON THE END OF THE PIPE AND INSPECTION PORT.
THE FILTER FABRIC TO BE ADS 4000 NONWOVEN OR EQUIVALENT. ABOUT 75 SQ. YD. NEEDED.
GRAVEL TO BE ANGULAR CRUSHED ROCK WITH THE MAJORITY BEING $\frac{3}{4}$"-2", ABOUT 60 CU. YD. NEEDED.

B. Hewes8/21/2008 12:13 PMwhiteperf.dwg

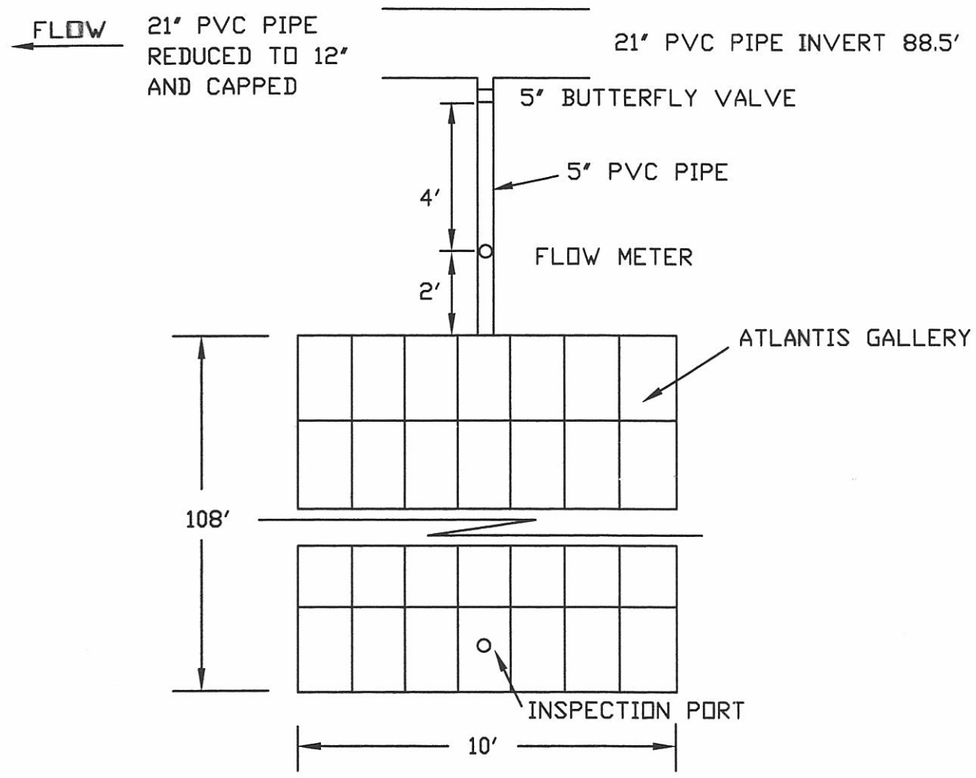
DATE 12/07
DESIGNED B. HEWES
CHECKED
APPRIVED

WWBWC/HBDIC UPPER RECHARGE PROJECT
4" PERF. & DRAIN FIELD PIPE DETAILS
UMATILLA COUNTY, OREGON
B H ENGINEERING

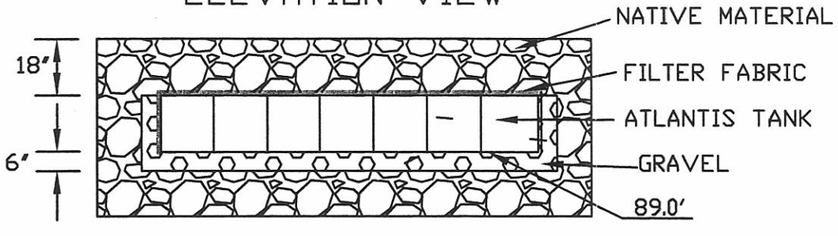
CAD FILE whiteperf

SHEET 4 OF 7

ATLANTIS RAIN TANK DETAIL
PLAN VIEW



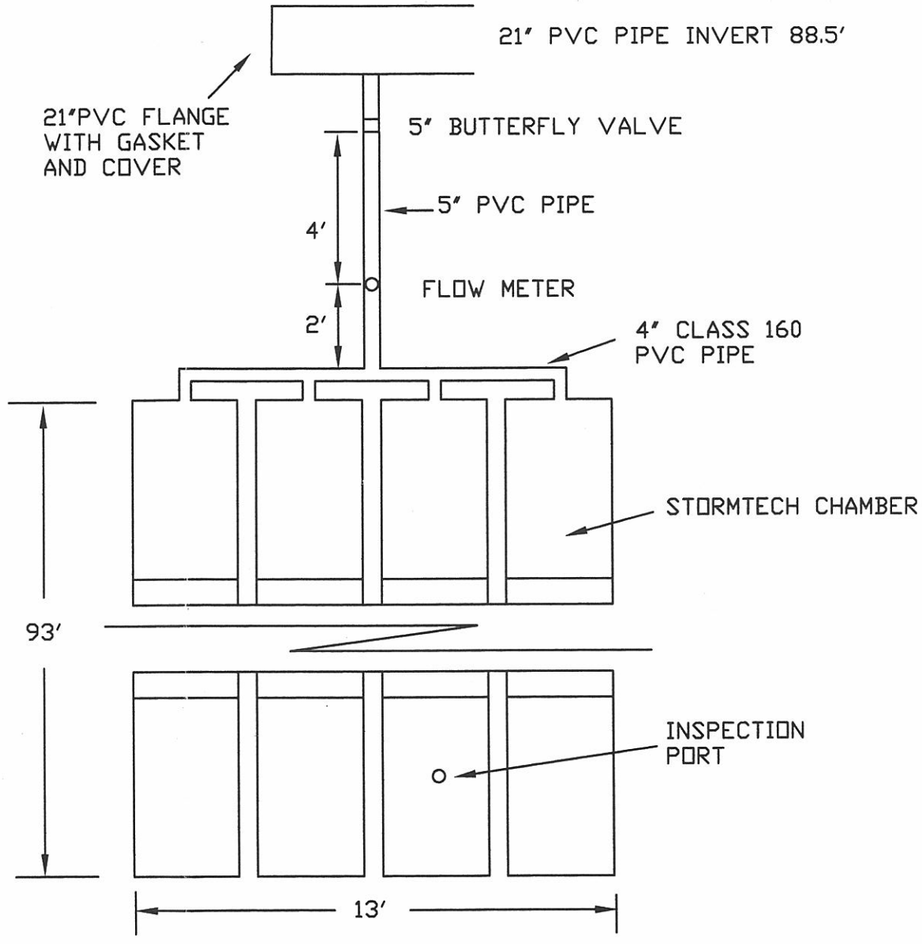
ELEVATION VIEW



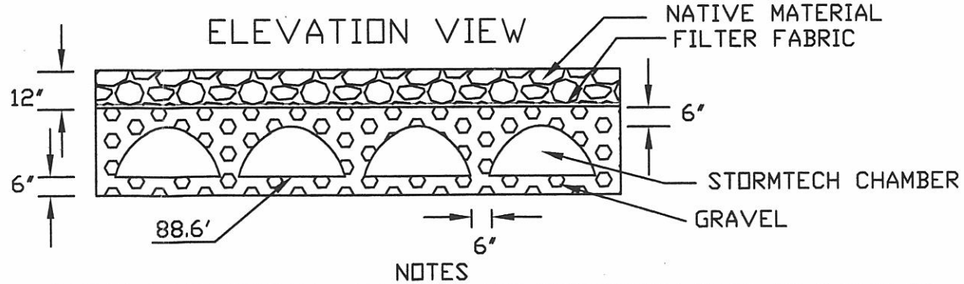
NOTES

ASSEMBLE AND INSTALL RAIN TANKS AND INSPECTION PORT AS DESCRIBED IN THE MANUFACTURERS LITERATURE. TANKS ARE 16" WIDE, 27" LONG AND 17¾" HIGH, NEED 336 TANKS FOR H-10 LOADING. USE 4" PVC PIPE FOR THE PORT, EXTEND 1' ABOVE GROUND AND PROTECT WITH A FENCE POST AND END CAP.
FILTER FABRIC TO BE ADS 4000 OR EQUIVALENT, NEED 160 SQ. YD.
FOLD AND TAPE THE CORNERS AS SHOWN IN THE LITERATURE.
GRAVEL TO BE ANGULAR CRUSHED ROCK WITH THE MAJORITY OF PARTICLES BETWEEN ¾"-2", NEED ABOUT 25 CU. YD.

STORMTECH CHAMBER
PLAN VIEW



ELEVATION VIEW



NOTES

ASSEMBLE AND INSTALL CHAMBERS AND INSPECTION PORT AS SHOWN IN THE MANUFACTURERS LITERATURE. TANKS ARE 34" WIDE, 7'-2" LONG AND 16" HIGH, NEED 50 CHAMBERS. IN LIEU OF THE SUBSURFACE PORT SHOWN IN THE LITERATURE EXTEND THE PORT 1' ABOVE GROUND AND PROTECT WITH A FENCE POST AND END CAP.
FILTER FABRIC TO BE ADS 4000 OR EQUIVALENT, NEED 190 SQ. YD.
GRAVEL TO BE ANGULAR CRUSHED ROCK WITH THE MAJORITY OF PARTICLES BETWEEN ¾"-2", NEED ABOUT 115 CU. YD.

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

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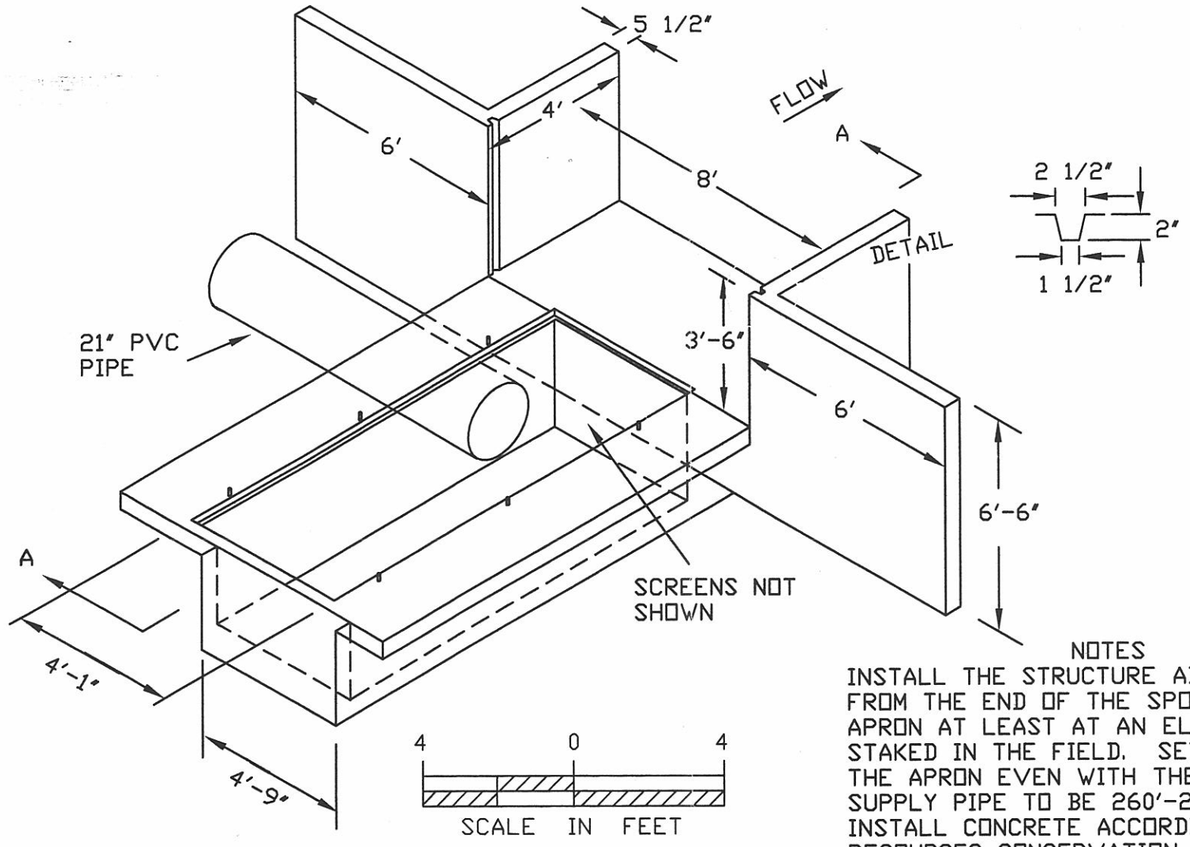
DATE 12/07
DESIGNED B. HEWES
CHECKED

WWBWC/HBDIC UPPER RECHARGE PROJECT
ATLANTIS & STORMTECH CHAMBERS DETAILS
UMATILLA COUNTY, OREGON

CAD FIL
whiteatlar

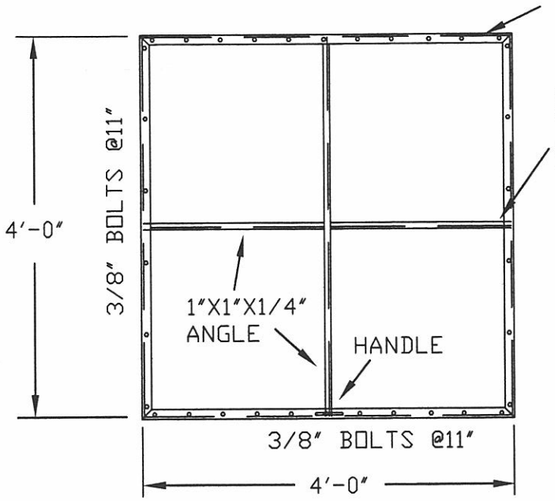
SHEET 5
OF 7

STRUCTURE PERSPECTIVE VIEW

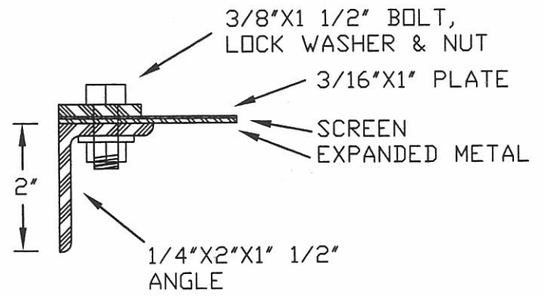


SCREEN FRAME DETAIL

3 NEEDED



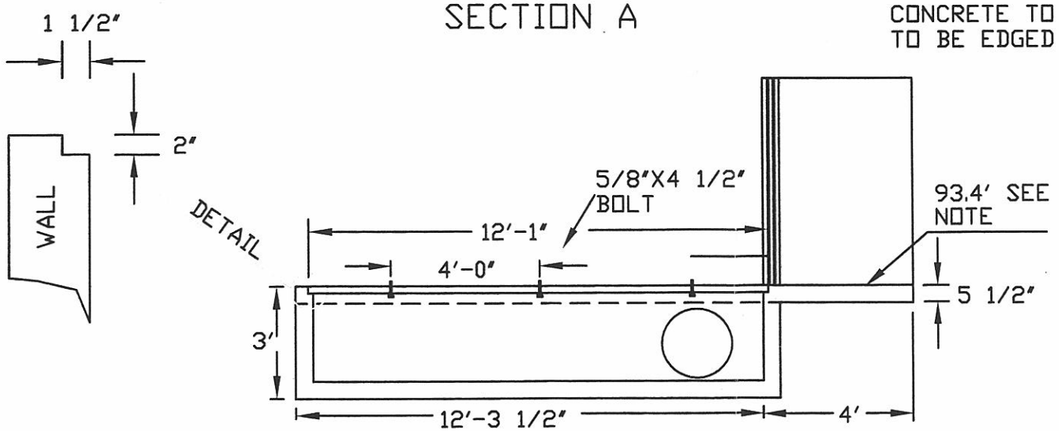
SCREEN FRAME DETAIL ELEVATION VIEW



NOTES

INSTALL THE STRUCTURE ABOUT 135' UPSTREAM FROM THE END OF THE SPOIL PILE WITH THE APRON AT LEAST AT AN ELEVATION OF 93.4' AS STAKED IN THE FIELD. SET THE ELEVATION OF THE APRON EVEN WITH THE CHANNEL BOTTOM.
SUPPLY PIPE TO BE 260'-21" CLASS 100 PVC.
INSTALL CONCRETE ACCORDING TO NATURAL RESOURCES CONSERVATION SERVICE SPECIFICATION 42, REINFORCED CONCRETE FOR MINOR STRUCTURES.
USE 4000 PSI STRENGTH CONCRETE, NEED 5.4 CU. YD.
CONCRETE TO BE VIBRATED, ALL EXPOSED EDGES TO BE EDGED WITH AN EDGING TOOL.

SECTION A



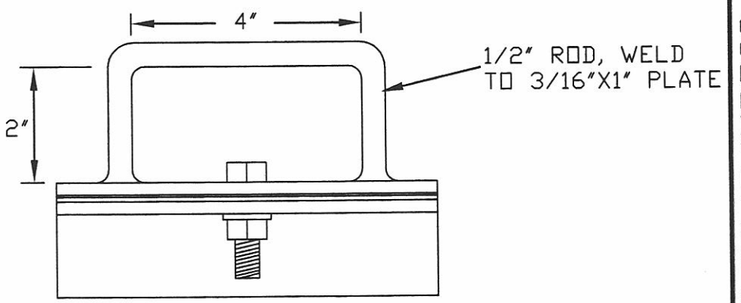
NOTE

NOTCH IS ON ALL 4 SIDES OF THE BOX.
BOLTS ARE TO HOLD DOWN THE SCREEN, USE A 1"X4"X¼"BAR WITH A 3/4" DIAMETER HOLE 1" FROM ONE END.

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

FRAME HANDLE DETAIL ELEVATION VIEW



NOTES

EXPANDED METAL TO BE CARBON STEEL, FLATTENED, 13 GAGE, 3/4" SHORT OPENING WIDTH.
SCREEN TO BE TYPE 304 STAINLESS STEEL, 20 GAGE MINIMUM WITH 3/32" HOLES SPACED 5/32" STAGGERED.

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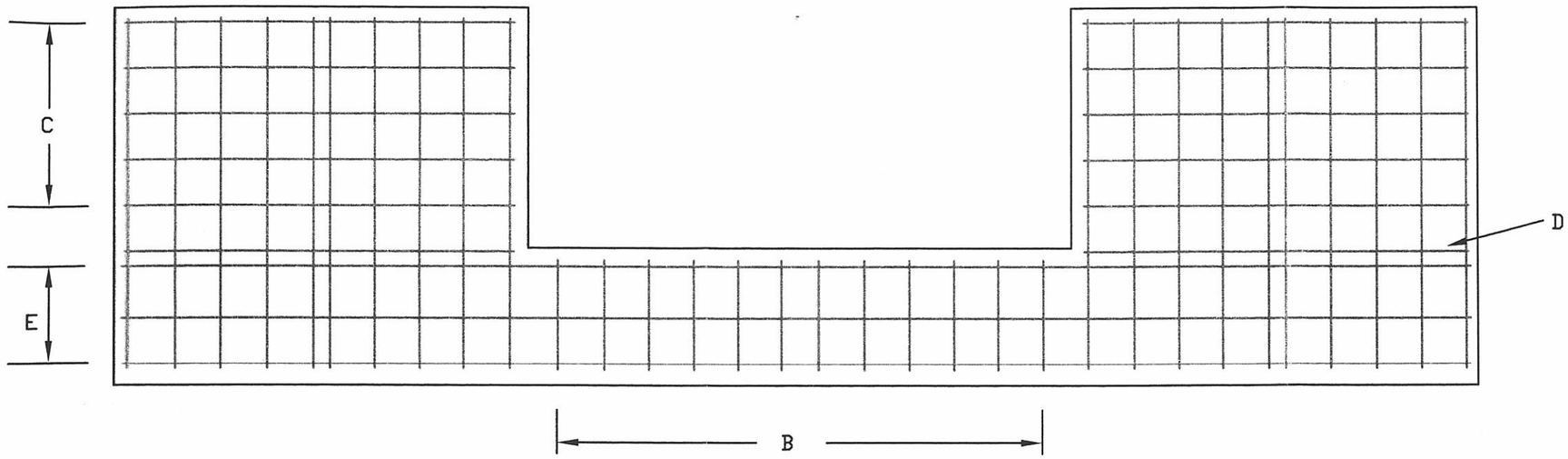
W/WBWC/HBDIC UPPER RECHARGE PROJECT
CHECK & SCREEN STRUCTURE
UMATILLA COUNTY, OREGON
R H ENGINEERING

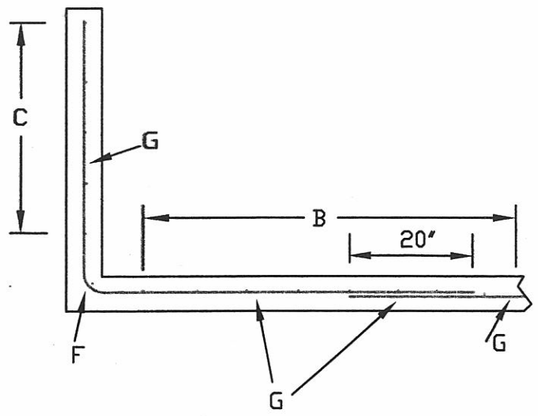
CAD FILE whitescreen

SHEET 6 OF 7

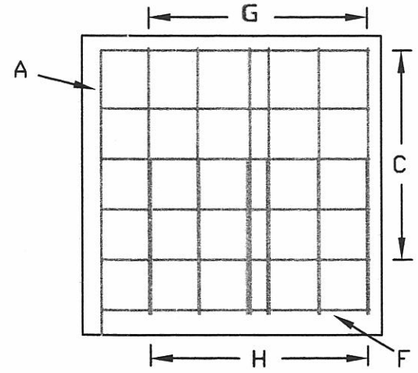
HEADWALL LOOKING DOWNSTREAM
ELEVATION VIEW



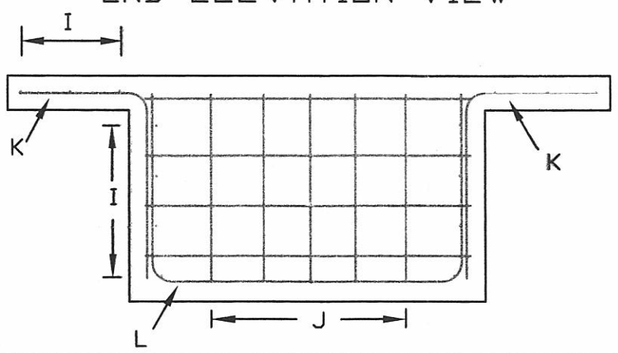
DOWNSTREAM SIDE WALL AND APRON
END ELEVATION VIEW



SIDE ELEVATION VIEW



SCREEN BOX
END ELEVATION VIEW



REINFORCING STEEL SCHEDULE

ALL NUMBER 4 BARS, 8" NOMINAL SPACING

BAR	NO.	SHAPE	A	B	C
A	20	STRAIGHT	6'-1"	--	--
B	12	A B	2'-7"	3'-7"	--
C	10	A B	5'-7"	3'-9"	--
D	2	STRAIGHT	5'-8"	--	--
E	3	STRAIGHT	19'-8"	--	--
F	2	STRAIGHT	3'-7"	--	--
G	12	A B	3'-7"	5'-1"	--
H	12	A B	2'-0"	2'-0"	--
I	14	STRAIGHT	12'-0"	--	--
J	5	A B	2'-6"	3'-8"	--
K	38	A B	1'-9"	2'-6"	--
L	19	A B C	2'-6"	4'-3"	2'-6"

1080 FEET NEEDED WITHOUT ANY WASTE

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

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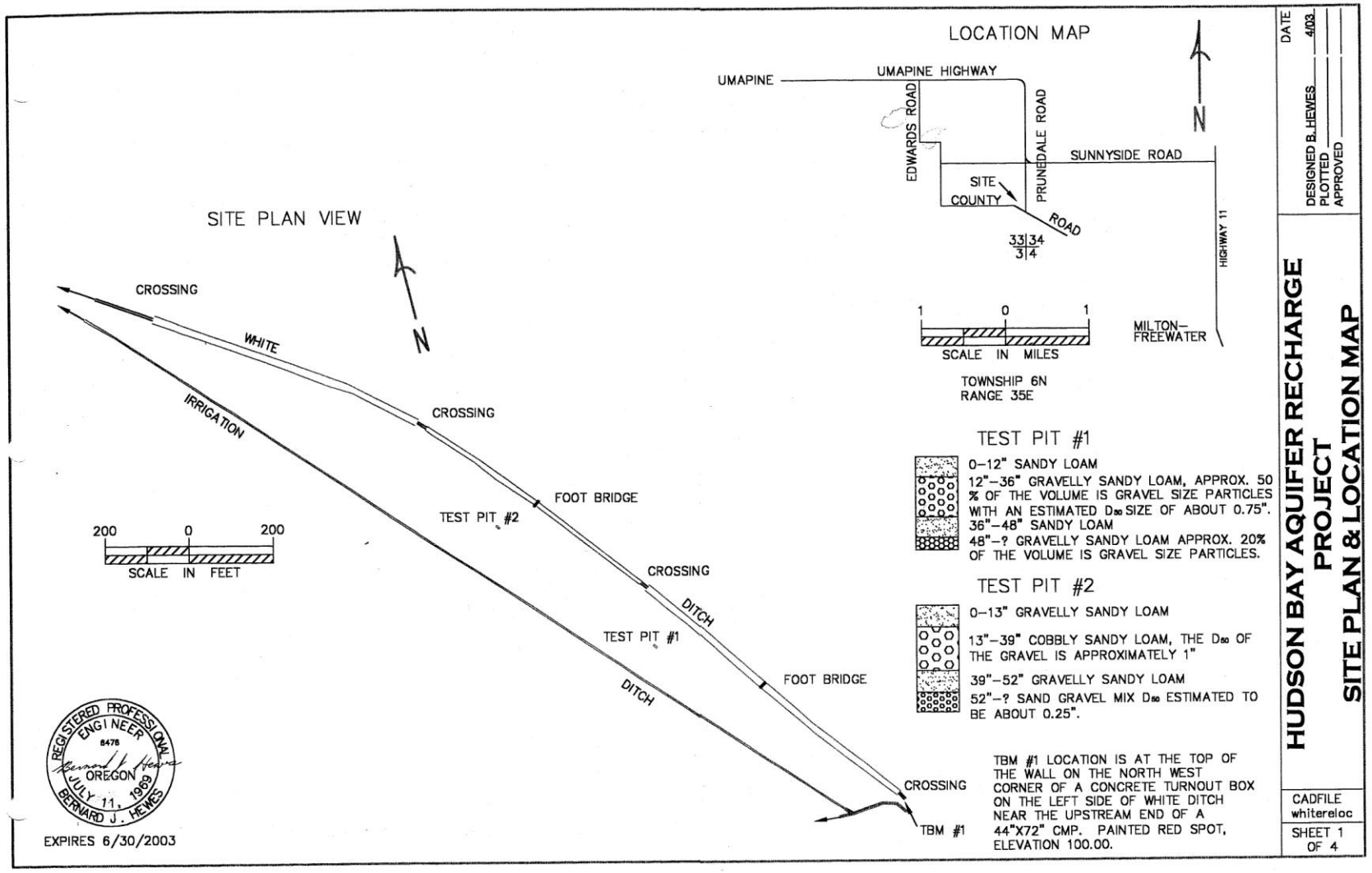
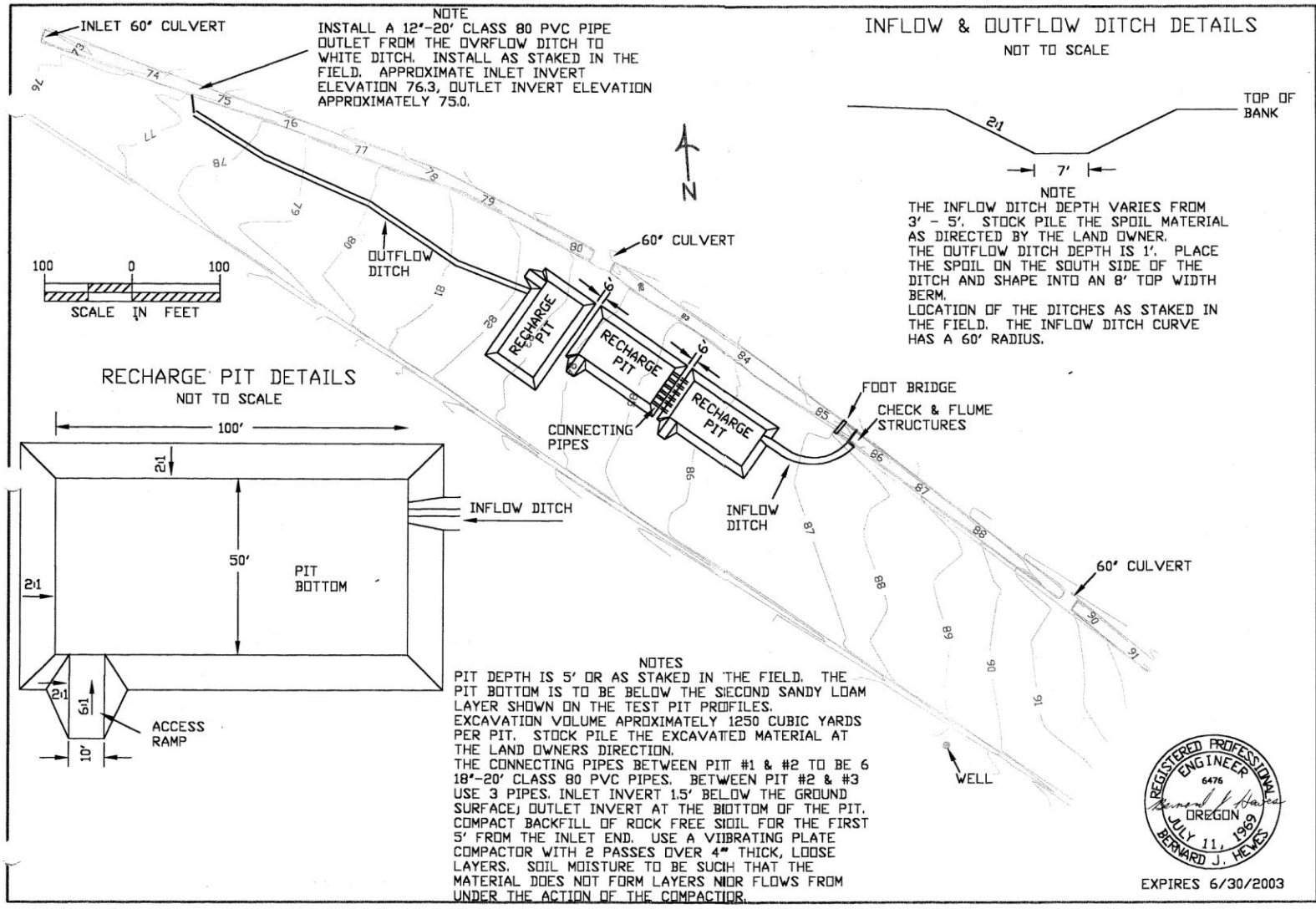
DESIGNED B. HEWES DATE 12/07
CHECKED
APPROVED

WWBWC/HBDIC UPPER RECHARGE PROJECT
REINFORCING STEEL DETAILS
UMATILLA COUNTY, OREGON
B H ENGINEERING

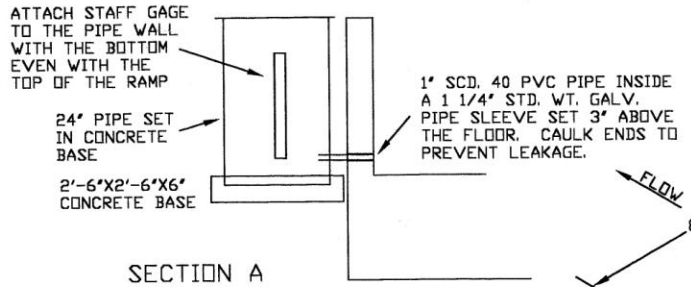
CAD FILE whiterebar

SHEET 7 OF 7

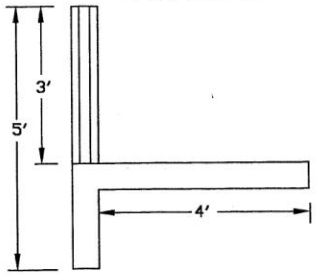

LOCATION MAP
UMAPINE
UMAPINE HIGHWAY
EDWARDS ROAD
PRUNEDALE ROAD
SUNNYSIDE ROAD
SITE
COUNTY
ROAD
33|34
3|4
HIGHWAY 11
MILTON–FREEWATER
1 0 1
SCALE IN MILES
TOWNSHIP 6N
RANGE 35E
SITE PLAN VIEW
CROSSING
WHITE
IRRIGATION
CROSSING
FOOT BRIDGE
TEST PIT #2
CROSSING
DITCH
TEST PIT #1
FOOT BRIDGE
DITCH
CROSSING
TBM #1
200 0 200
SCALE IN FEET
TEST PIT #1
0–12" SANDY LOAM
12"–36" GRAVELLY SANDY LOAM, APPROX. 50 % OF THE VOLUME IS GRAVEL SIZE PARTICLES WITH AN ESTIMATED D∞ SIZE OF ABOUT 0.75".
36"–48" SANDY LOAM
48"–? GRAVELLY SANDY LOAM APPROX. 20% OF THE VOLUME IS GRAVEL SIZE PARTICLES.
TEST PIT #2
0–13" GRAVELLY SANDY LOAM
13"–39" COBBLY SANDY LOAM, THE D∞ OF THE GRAVEL IS APPROXIMATELY 1"
39"–52" GRAVELLY SANDY LOAM
52"–? SAND GRAVEL MIX D∞ ESTIMATED TO BE ABOUT 0.25".
TBM #1 LOCATION IS AT THE TOP OF THE WALL ON THE NORTH WEST CORNER OF A CONCRETE TURNOUT BOX ON THE LEFT SIDE OF WHITE DITCH NEAR THE UPSTREAM END OF A 44"X72" CMP. PAINTED RED SPOT, ELEVATION 100.00.
REGISTERED PROFESSIONAL ENGINEER
8478
OREGON
JULY 11, 1969
BERNARD J. HEWES
EXPIRES 6/30/2003
DATE 4/03
DESIGNED B. HEWES
PLOTTED
APPROVED
HUDSON BAY AQUIFER RECHARGE PROJECT
SITE PLAN & LOCATION MAP
CADFILE whiteeloc
SHEET 1 OF 4

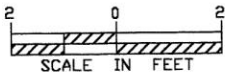

INLET 60" CULVERT
NOTE
INSTALL A 12'-20' CLASS 80 PVC PIPE OUTLET FROM THE OVRFLOW DITCH TO WHITE DITCH. INSTALL AS STAKED IN THE FIELD. APPROXIMATE INLET INVERT ELEVATION 76.3, OUTLET INVERT ELEVATION APPROXIMATELY 75.0.
INFLOW & OUTFLOW DITCH DETAILS
NOT TO SCALE
TOP OF BANK
2:1
7'
NOTE
THE INFLOW DITCH DEPTH VARIES FROM 3' - 5'. STOCK PILE THE SPOIL MATERIAL AS DIRECTED BY THE LAND OWNER.
THE OUTFLOW DITCH DEPTH IS 1'. PLACE THE SPOIL ON THE SOUTH SIDE OF THE DITCH AND SHAPE INTO AN 8' TOP WIDTH BERM.
LOCATION OF THE DITCHES AS STAKED IN THE FIELD. THE INFLOW DITCH CURVE HAS A 60' RADIUS.
N
OUTFLOW DITCH
60" CULVERT
100 0 100
SCALE IN FEET
RECHARGE PIT
RECHARGE PIT
RECHARGE PIT
6'
6'
CONNECTING PIPES
FOOT BRIDGE
CHECK & FLUME STRUCTURES
INFLOW DITCH
INFLOW DITCH
60" CULVERT
WELL
RECHARGE PIT DETAILS
NOT TO SCALE
100'
2:1
50'
PIT BOTTOM
2:1
2:1
6:1
ACCESS RAMP
10'
NOTES
PIT DEPTH IS 5' OR AS STAKED IN THE FIELD. THE PIT BOTTOM IS TO BE BELOW THE SECOND SANDY LOAM LAYER SHOWN ON THE TEST PIT PROFILES.
EXCAVATION VOLUME APROXIMATELY 1250 CUBIC YARDS PER PIT. STOCK PILE THE EXCAVATED MATERIAL AT THE LAND OWNERS DIRECTION.
THE CONNECTING PIPES BETWEEN PIT #1 & #2 TO BE 6 18'-20' CLASS 80 PVC PIPES. BETWEEN PIT #2 & #3 USE 3 PIPES. INLET INVERT 1.5' BELOW THE GROUND SURFACE; OUTLET INVERT AT THE BOTTOM OF THE PIT. COMPACT BACKFILL OF ROCK FREE SOIL FOR THE FIRST 5' FROM THE INLET END. USE A VIBRATING PLATE COMPACTOR WITH 2 PASSES OVER 4" THICK, LOOSE LAYERS. SOIL MOISTURE TO BE SUCH THAT THE MATERIAL DOES NOT FORM LAYERS NOR FLOWS FROM UNDER THE ACTION OF THE COMPACTOR.
REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES
EXPIRES 6/30/2003
DATE 4/03
DESIGNED B.HEWES
PLOTTED
APPROVED
HUDSON BAY AQUIFER RECHARGE PROJECT
SITE PLAN
CADFILE whiteplan
SHEET 2 OF 4

STILLING WELL DETAIL



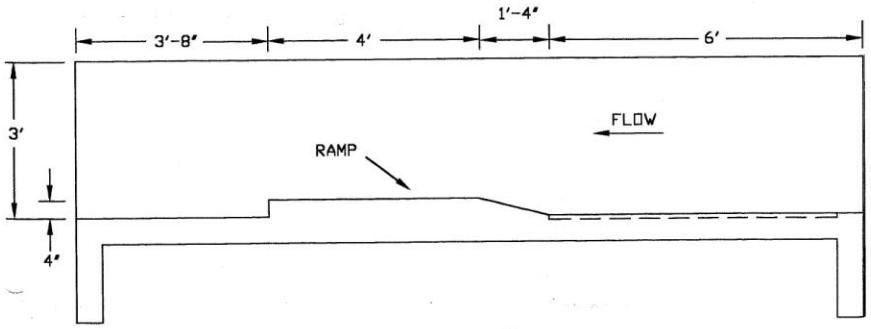
SECTION A



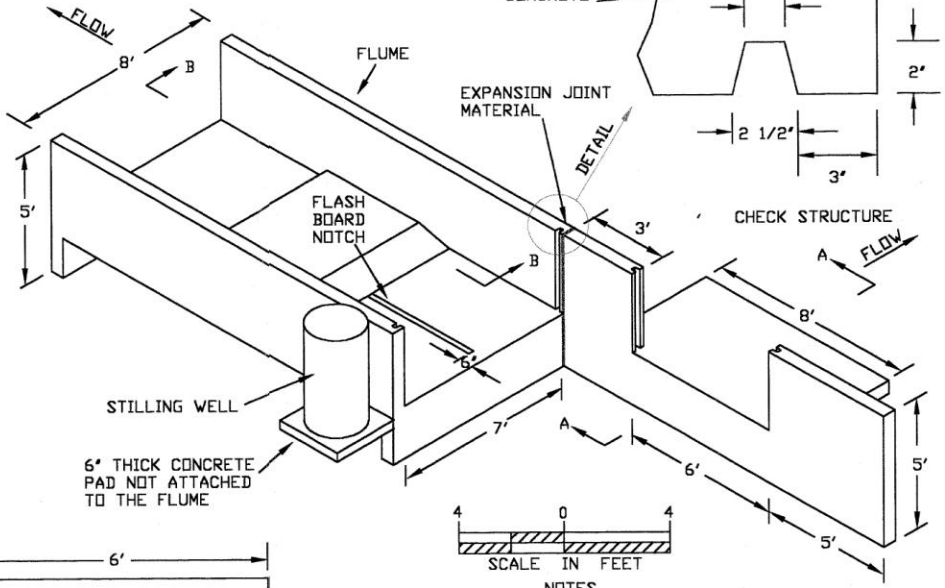


EXPIRES 6/30/2003

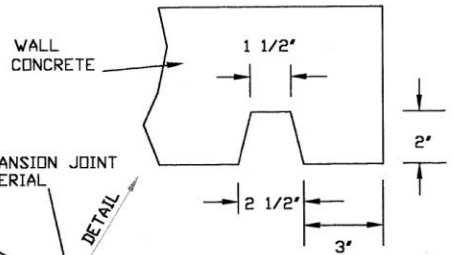
SECTION B



CHECK STRUCTURE & FLUME STRUCTURE PERSPECTIVE VIEW



FLASH BOARD NOTCH DETAIL



NOTES

INSTALL THE CONCRETE IN ACCORDANCE WITH CONSTRUCTION SPECIFICATION 42, ATTACHED.
ALL WALLS AND FLOORS TO BE 6" THICK.
USE 4000 PSI STRENGTH CONCRETE. 1.6 CUBIC YARDS NEEDED FOR THE CHECK STRUCTURE AND 4.9 CUBIC YARDS NEEDED FOR THE FLUME.
SEPARATE THE TWO STRUCTURES USING A 6"X 1/2"X 5' STRIP OF ASPHALT EXPANSION JOINT FILLER.
THE STILLING WELL PIPE MAY BE CORRUGATED METAL OR CLASS 80, MINIMUM, PVC PIPE.
THE FLASH BOARD NOTCH IN THE BOTTOM OF THE FLUME IS TO HOLD THE BOTTOM OF A SPLITTER WALL. USE 2 PIECES OF 3/4" MARINE PLYWOOD. HOLD THE TOP AT THE DOWNSTREAM END WITH A 2"X8"X8' WITH 2-2"X4"X8' CLEATS. AT THE UPSTREAM END USE 2-2"X12"X8' WITH 2-2"X4"X24' CLEATS.

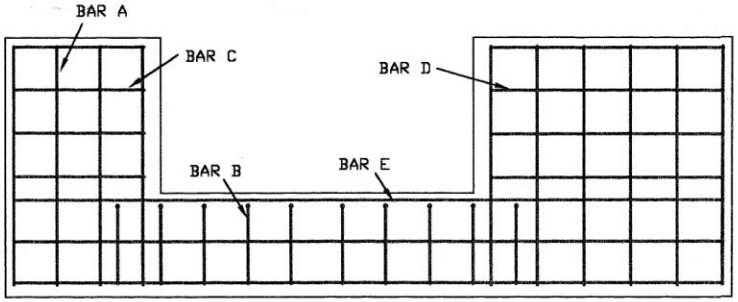
DATE 4/03
DESIGNED B. HEWES
PLOTTED
APPROVED

HUDSON BAY AQUIFER RECHARGE PROJECT
STRUCTURE DETAILS

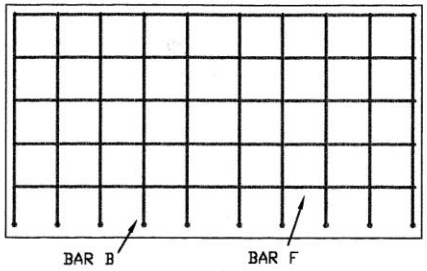
CADFILE whiteck

SHEET 3 OF 4

CHECK STRUCTURE ELEVATION VIEW



APRON PLAN VIEW



REINFORCING STEEL SCHEDULE

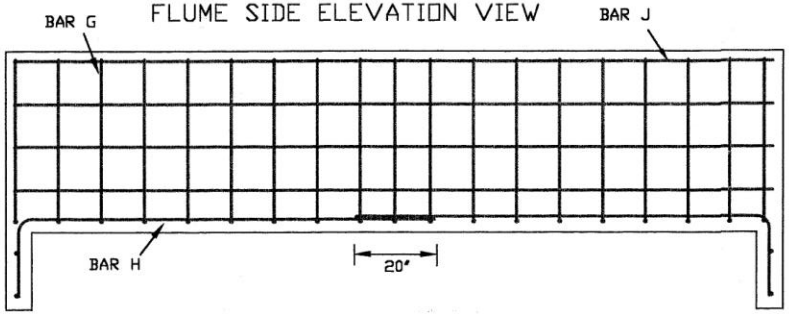
BAR	NO.	SHAPE	A	B	C
		CHECK			
A	10	STRAIGHT	4′-7″	–	–
B	10	AL B	1′-7″	4′-1″	–
C	4	STRAIGHT	2′-6″	–	–
D	4	STRAIGHT	4′-6″	–	–
E	3	STRAIGHT	13′-8″	–	–
F	5	STRAIGHT	7′-8″	–	–
		FLUME			
G	19	AL B C	3′-1″	7′-6″	3′-1″
H	20	AL B	1′-6″	8′-1″	–
I	4	STRAIGHT	7′-6″	–	–
J	8	STRAIGHT	14′-6″	–	–

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

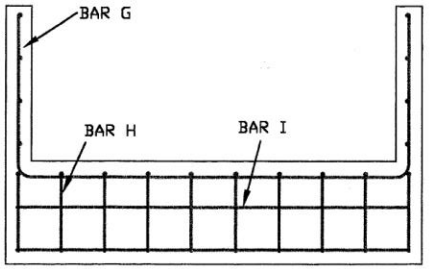
EXPIRES 6/30/2003

NOTES
ALL BARS TO BE NUMBER 4.
BARS TO BE PLACED IN THE CENTER OF THE WALLS AND FLOOR.
NEED 820 LINEAL FEET OF REINFORCING BARS WITHOUT ANY WASTE.

FLUME SIDE ELEVATION VIEW



FLUME END WALL ELEVATION VIEW

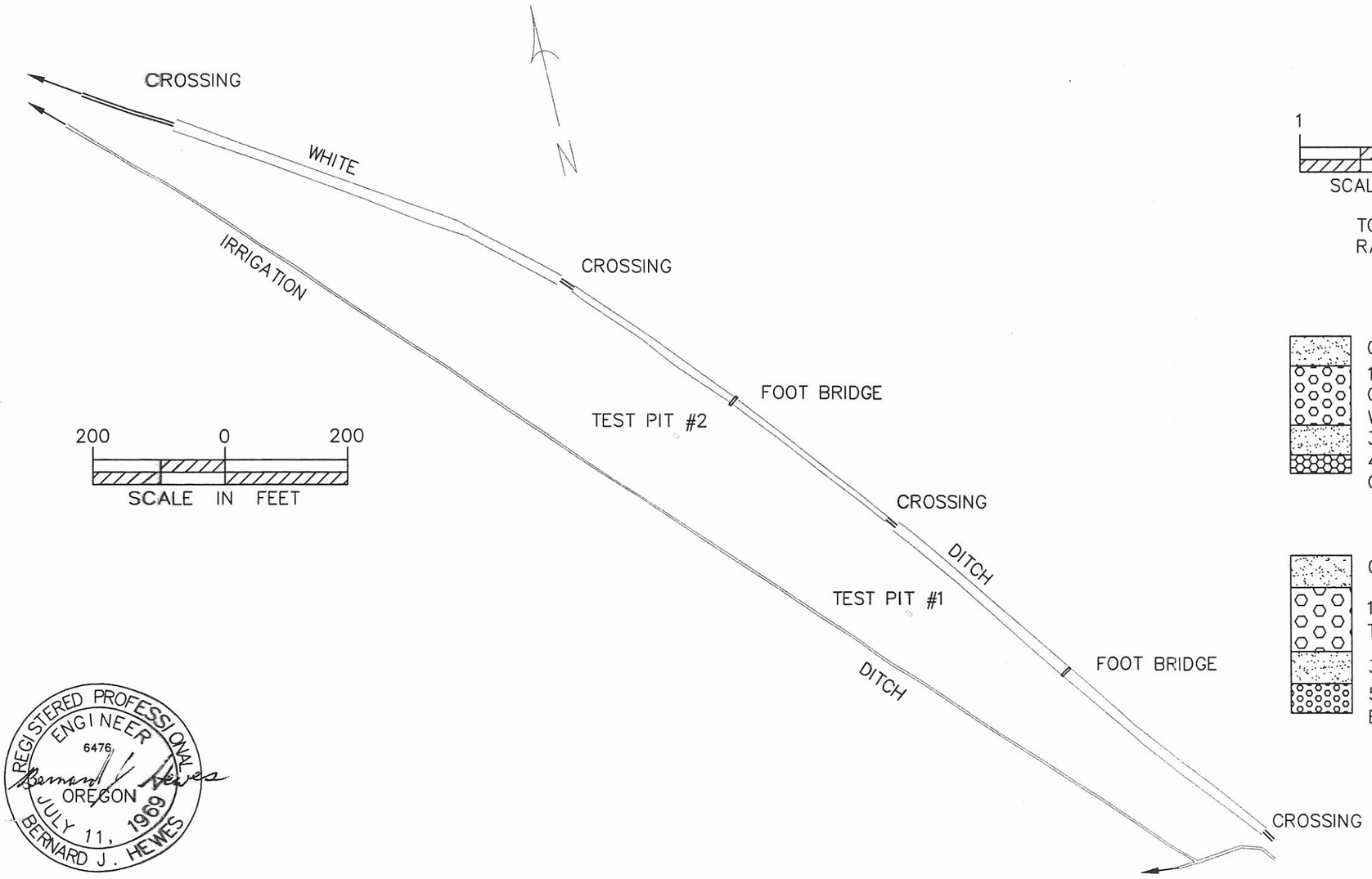


DATE 4/03
DESIGNED B.HEWES
PLOTTED
APPROVED

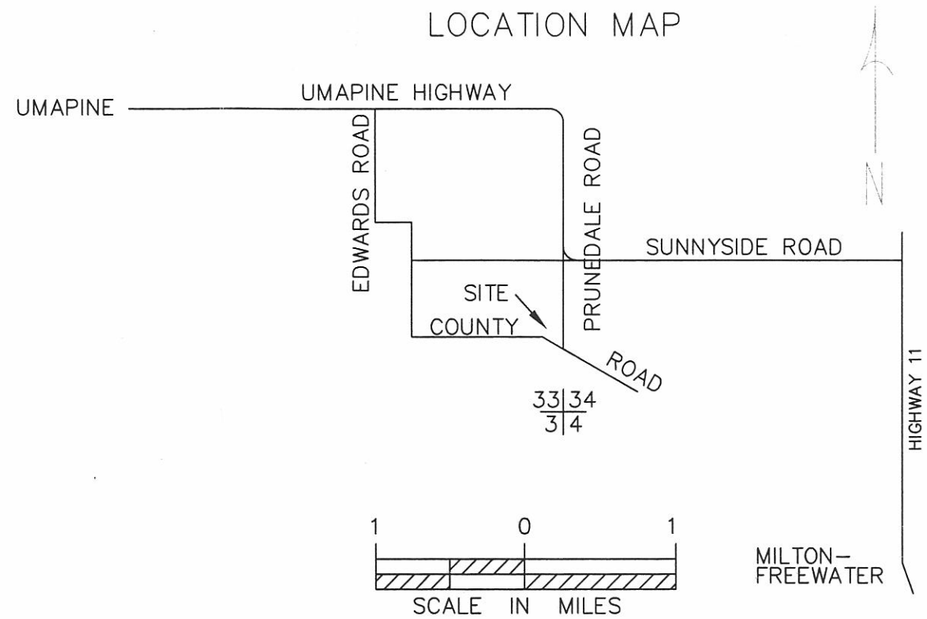
HUDSON BAY AQUIFER RECHARGE PROJECT
STRUCTURE REINFORCING STEEL

CADFILE whiteckst

SITE PLAN VIEW



LOCATION MAP



TOWNSHIP 6N
RANGE 35E

TEST PIT #1

0–12" SANDY LOAM

12"–36" GRAVELY SANDY LOAM, APPROX. 50% OF THE VOLUME IS GRAVEL SIZE PARTICLES WITH AN ESTIMATED D_{50} SIZE OF ABOUT 0.75".

36"–48" SANDY LOAM

48"–? GRAVELY SANDY LOAM APPROX. 20% OF THE VOLUME IS GRAVEL SIZE PARTICLES.

TEST PIT #2

0–13" GRAVELY SANDY LOAM

13"–39" COBBLY SANDY LOAM, THE D_{50} OF THE GRAVEL IS APPROXIMATELY 1"

39"–52" GRAVELY SANDY LOAM

52"–? SAND GRAVEL MIX D_{50} ESTIMATED TO BE ABOUT 0.25".

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

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DATE
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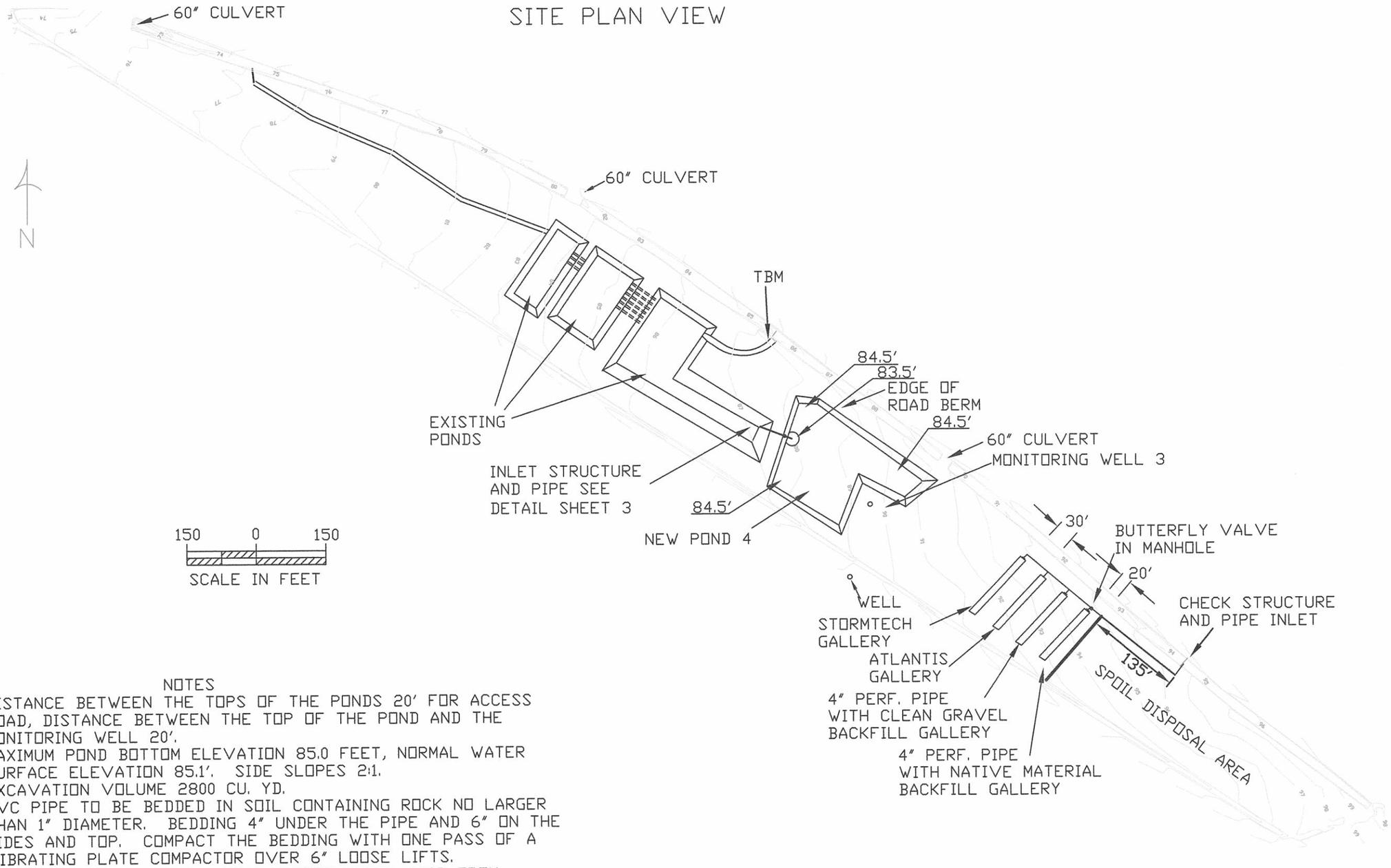
APPROVED

WWBWC/HBDIC UPPER RECHARGE PROJECT
SITE PLAN & LOCATION MAP
UMATILLA COUNTY, OREGON

CADFILE
whitereloc

SHEET 1
OF 7

SITE PLAN VIEW



NOTES

DISTANCE BETWEEN THE TOPS OF THE PONDS 20' FOR ACCESS ROAD, DISTANCE BETWEEN THE TOP OF THE POND AND THE MONITORING WELL 20'.
MAXIMUM POND BOTTOM ELEVATION 85.0 FEET, NORMAL WATER SURFACE ELEVATION 85.1'. SIDE SLOPES 2:1.
EXCAVATION VOLUME 2800 CU. YD.
PVC PIPE TO BE BEDDED IN SOIL CONTAINING ROCK NO LARGER THAN 1" DIAMETER. BEDDING 4" UNDER THE PIPE AND 6" ON THE SIDES AND TOP. COMPACT THE BEDDING WITH ONE PASS OF A VIBRATING PLATE COMPACTOR OVER 6" LOOSE LIFTS.
CONSIDER FLOW METERS: AQUA MASTER MODEL 900R FROM JENNINGS INC.
McCROMETER MODEL E0300 PROPELLER STYLE METER.
CHECK FOR COMPATIBILITY WITH YOUR EXISTING RECORDING AND CONTROL EQUIPMENT.
SPACE THE DIFFERENT KIND OF GALLERIES 30'.
TBM IS AT THE TOP OF THE RIGHT SIDE WALL, DOWNSTREAM END OF THE FLUME. ELEVATION 88.7 FEET.

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2009

B. Hewes 8/21/2008 11:59 AM whiteex-tpln2.dwg

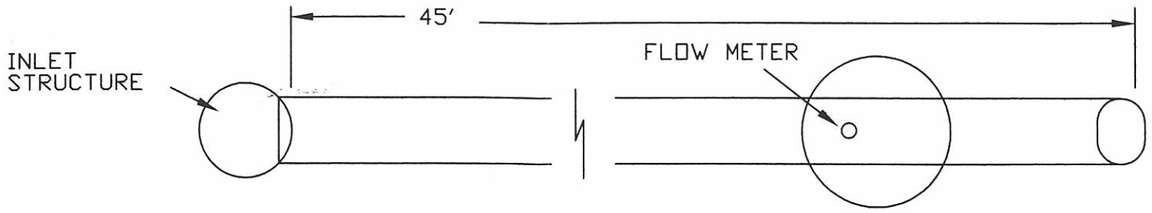
DATE
DESIGNED B. HEWES 11/07
PLOTTED
APPROVED

WWBWC/HBDIC UPPER RECHARGE PROJECT
SITE PLAN
UMATILLA COUNTY, OREGON

CADFILE
whitextpln2

SHEET 2
OF 7

SUPPLY PIPE TO POND 4 PLAN VIEW



NOTES

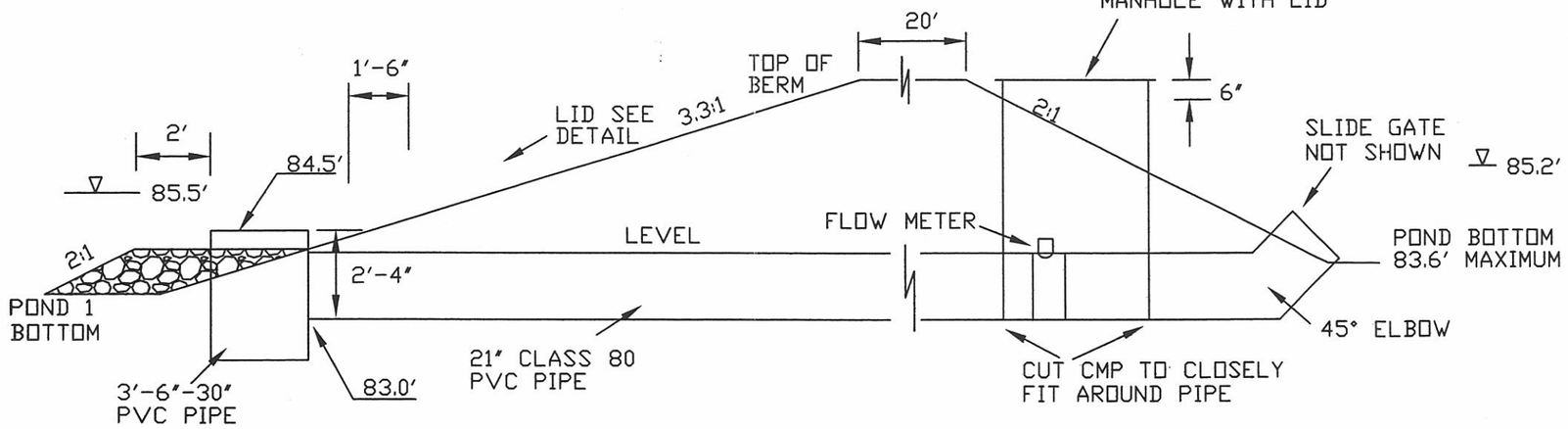
CUT THE HOLE IN THE INLET STRUCTURE TO CLOSELY FIT AROUND THE SUPPLY PIPE. FILL THE SPACE BETWEEN THE STRUCTURE AND PIPES WITH CAULKING ON BOTH SIDES.

THE BOTTOM LIP OF THE 45° ELBOW CAN BE NO LESS THAN 0.2' BELOW THE TOP OF THE 21" PIPE.

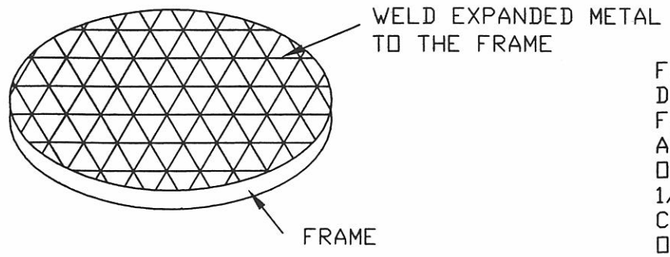
LID FOR THE CMP MANHOLE TO BE GALVANIZED $\frac{1}{8}$" THICK STEEL.

SLIDE GATE TO BE A WATERMAN C-8-4 OR EQUIVALENT. INSTALL A CATWALK FOR ACCESS TO THE SLIDE GATE.

SIDE ELEVATION VIEW TYPICAL

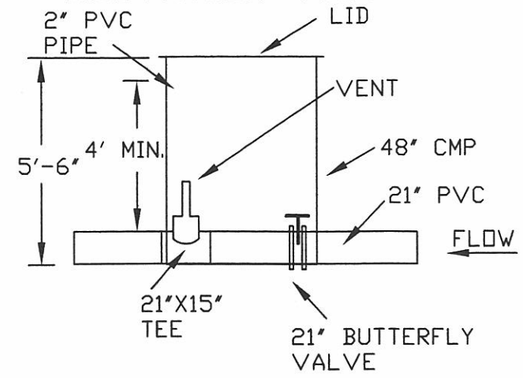


INLET STRUCTURE TRASH RACK DETAIL PERSPECTIVE VIEW

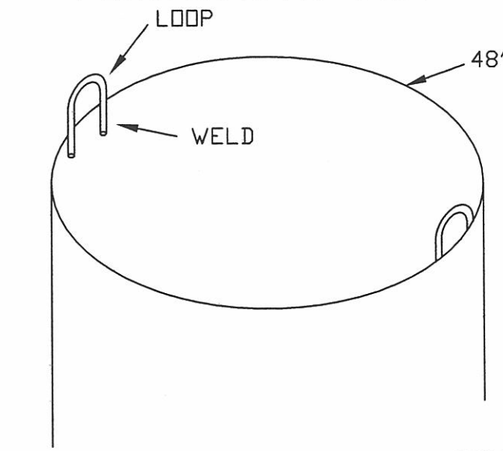


FRAME IS $\frac{1}{8}$" X 3" STEEL, INSIDE DIAMETER 32". COVER TO BE FLATTENED EXPANDED METAL APPROXIMATELY 0.120" THICK; OPENINGS APPROXIMATELY 1/2" X 1 5/8 ". CLEAN AND PAINT WITH 2 COATS OF HIGH ZINC COLD GALVANIZING PAINT.

GALLERY SUPPLY PIPE VALVE DETAILS ELEVATION VIEW



MANHOLE LID HOLD DOWN PERSPECTIVE VIEW



USE 1/2" DIAMETER ROD TO MAKE LOOPS. DIAMETER OF THE LOOP 2"

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MISCELLANEOUS DETAILS
UMATILLA COUNTY, OREGON

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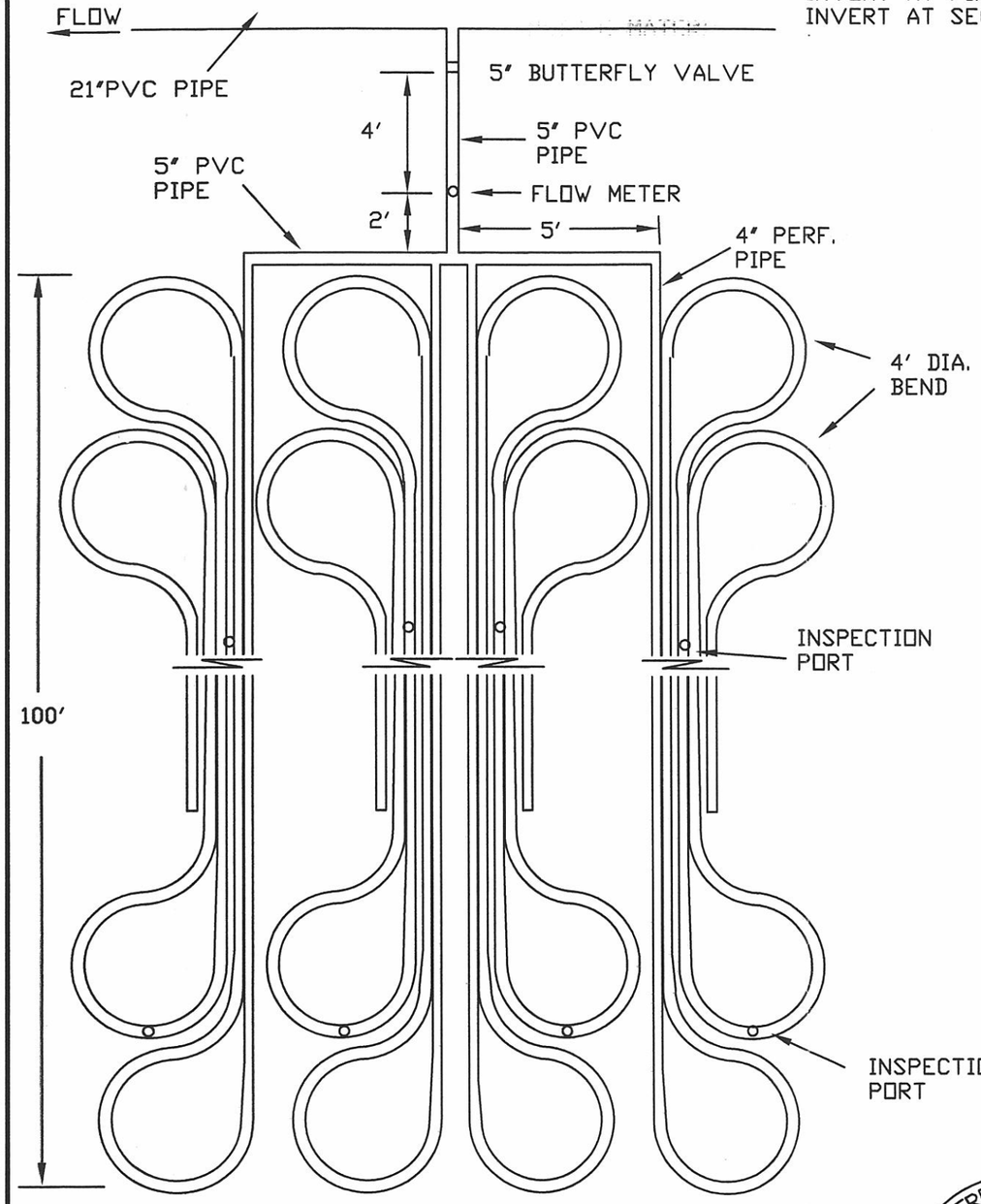
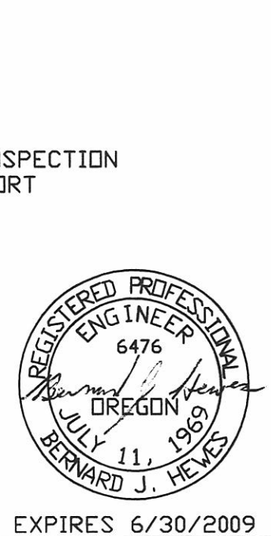
SHEET 3 OF 7

TYPICAL 4" PERFORATED PIPE GALLERY
PLAN VIEW



NOTE: ON THIS SIDE THE PERF. PIPE CHANGED TO SMOOTH DRAIN FIELD PIPE WITH A TEE FOR EACH PIPE ROW, 20 ROWS.



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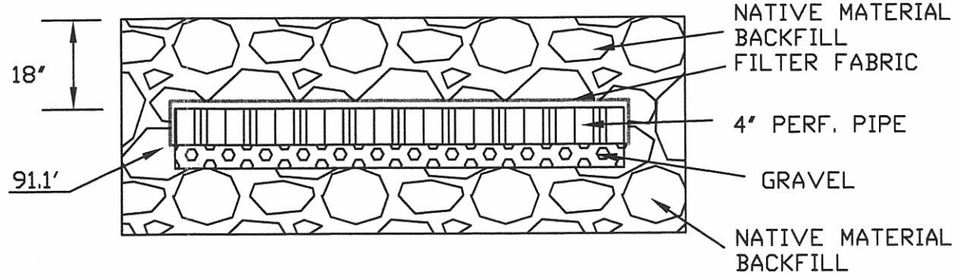
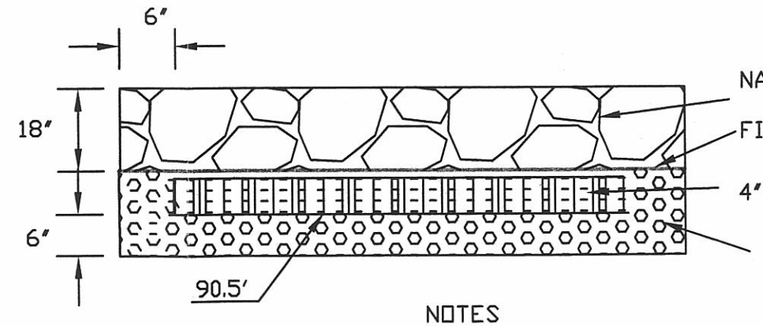
4" PERFORATED PIPE WITH NATIVE MATERIAL BACKFILL
ELEVATION VIEW



NOTES

NEED 2000' OF ADS 4" SINGLE WALL, PERFORATED, CORRUGATED POLYETHYLENE PIPE OR EQUIVALENT. CONNECT THE 4" TO THE 5" PIPE USING A MAR-MAC POLYSEAL PIPE COUPLER OR EQUIVALENT.
USE ONLY ENOUGH GRAVEL BEDDING TO PROVIDE A SMOOTH SURFACE TO LAY THE PIPE ON OR REMOVE ALL ROCK GREATER THAN 2" IN DIAMETER FROM CONTACTING THE PIPE.
THE INSPECTION PORT TO BE INSTALLED WHERE THE TWO PIPE ROLLS CONNECT AND NEAR THE END AS SHOWN. CONNECT THE ROLLS WITH A 4" TEE, USE 2' OF VERTICAL 4" PERF. PIPE WRAPPED WITH FILTER FABRIC FOR AN INSPECTION PORT. INSTALL A 4" CAP ON THE END OF THE PIPE AND INSPECTION PORT.
THE FILTER FABRIC TO BE ADS 4000 NONWOVEN OR EQUIVALENT. ABOUT 75 SQ. YD. NEEDED.

4" DRAIN FIELD PIPE WITH GRAVEL BEDDING
ELEVATION VIEW



NOTES

NEED 2000' OF 4" PVC DRAIN FIELD PIPE. CONNECT THE 4" TO THE 5" PIPE USING A MAR-MAC POLYSEAL PIPE COUPLER OR EQUIVALENT.
THE INSPECTION PORTS TO BE INSTALLED NEAR THE MIDDLE OF ONE OF THE ROWS AND NEAR THE END. USE 2' OF VERTICAL 4" PIPE WRAPPED WITH FILTER FABRIC FOR AN INSPECTION PORT. INSTALL A 4" CAP ON THE END OF THE PIPE AND INSPECTION PORT.
THE FILTER FABRIC TO BE ADS 4000 NONWOVEN OR EQUIVALENT. ABOUT 75 SQ. YD. NEEDED.
GRAVEL TO BE ANGULAR CRUSHED ROCK WITH THE MAJORITY BEING $\frac{3}{4}$"-2", ABOUT 60 CU. YD. NEEDED.

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4" PERF. & DRAIN FIELD PIPE DETAILS
UMATILLA COUNTY, OREGON
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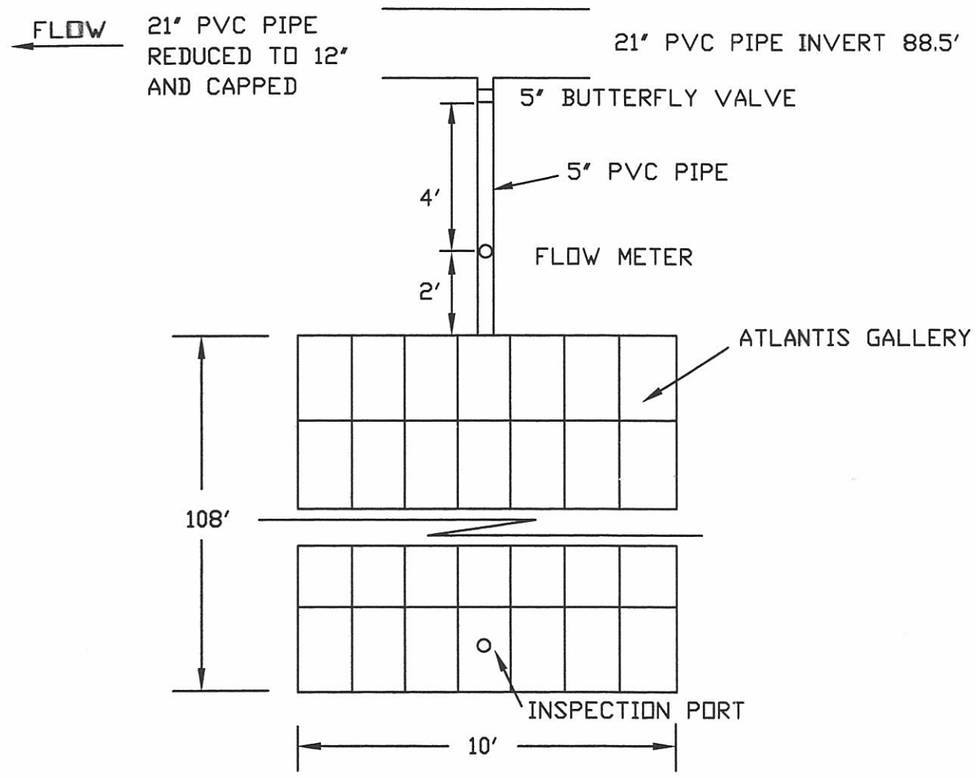
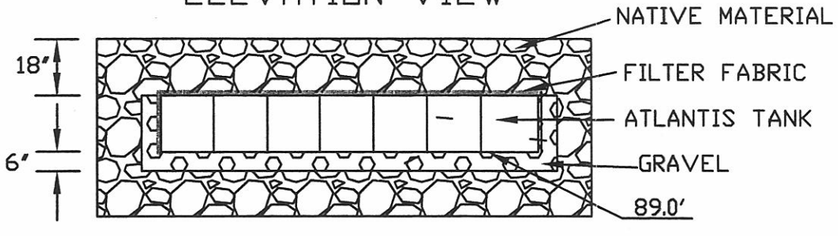
SHEET 4 OF 7

ATLANTIS RAIN TANK DETAIL
PLAN VIEW



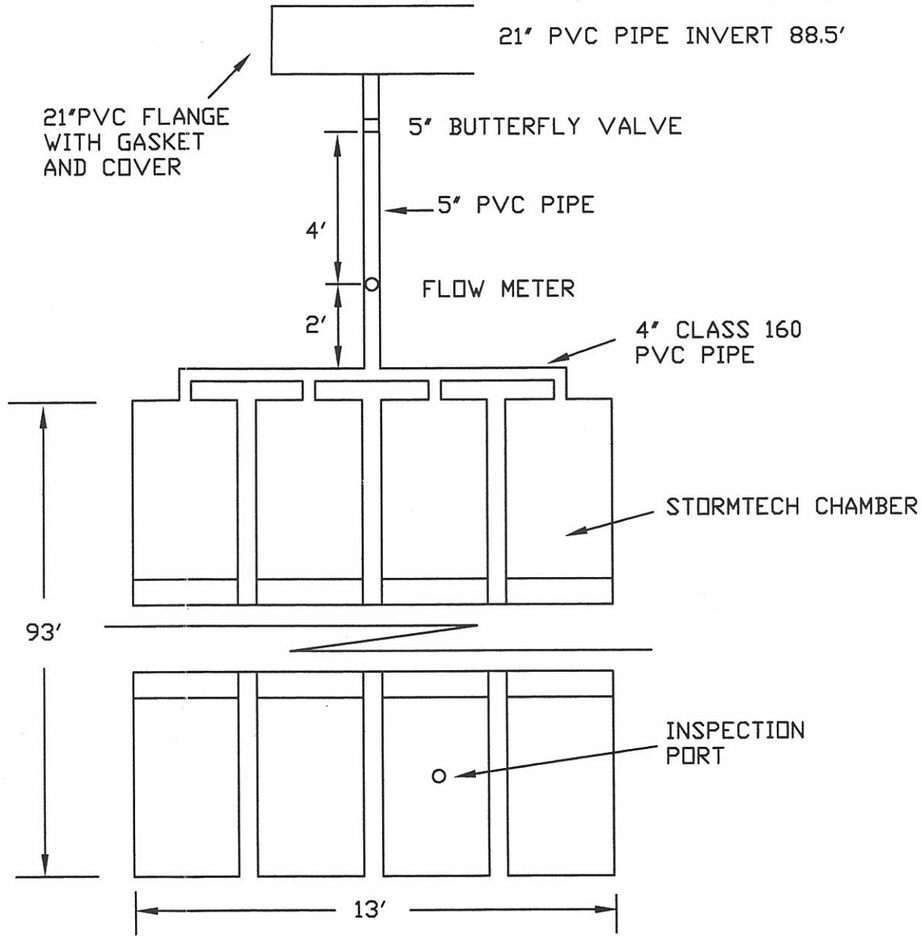
ELEVATION VIEW



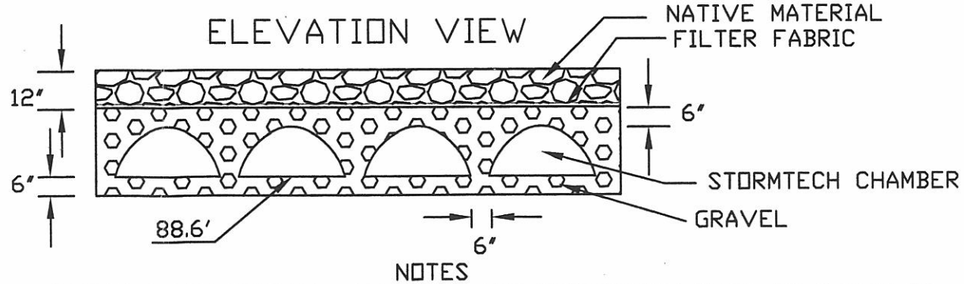
NOTES

ASSEMBLE AND INSTALL RAIN TANKS AND INSPECTION PORT AS DESCRIBED IN THE MANUFACTURERS LITERATURE. TANKS ARE 16" WIDE, 27" LONG AND 17¾" HIGH, NEED 336 TANKS FOR H-10 LOADING. USE 4" PVC PIPE FOR THE PORT, EXTEND 1' ABOVE GROUND AND PROTECT WITH A FENCE POST AND END CAP.
FILTER FABRIC TO BE ADS 4000 OR EQUIVALENT, NEED 160 SQ. YD.
FOLD AND TAPE THE CORNERS AS SHOWN IN THE LITERATURE.
GRAVEL TO BE ANGULAR CRUSHED ROCK WITH THE MAJORITY OF PARTICLES BETWEEN ¾"-2", NEED ABOUT 25 CU. YD.

STORMTECH CHAMBER
PLAN VIEW



ELEVATION VIEW



NOTES

ASSEMBLE AND INSTALL CHAMBERS AND INSPECTION PORT AS SHOWN IN THE MANUFACTURERS LITERATURE. TANKS ARE 34" WIDE, 7'-2" LONG AND 16" HIGH, NEED 50 CHAMBERS. IN LIEU OF THE SUBSURFACE PORT SHOWN IN THE LITERATURE EXTEND THE PORT 1' ABOVE GROUND AND PROTECT WITH A FENCE POST AND END CAP.
FILTER FABRIC TO BE ADS 4000 OR EQUIVALENT, NEED 190 SQ. YD.
GRAVEL TO BE ANGULAR CRUSHED ROCK WITH THE MAJORITY OF PARTICLES BETWEEN ¾"-2", NEED ABOUT 115 CU. YD.

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JULY 11, 1969
BERNARD J. HEWES

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WWBWC/HBDIC UPPER RECHARGE PROJECT
ATLANTIS & STORMTECH CHAMBERS DETAILS
UMATILLA COUNTY, OREGON

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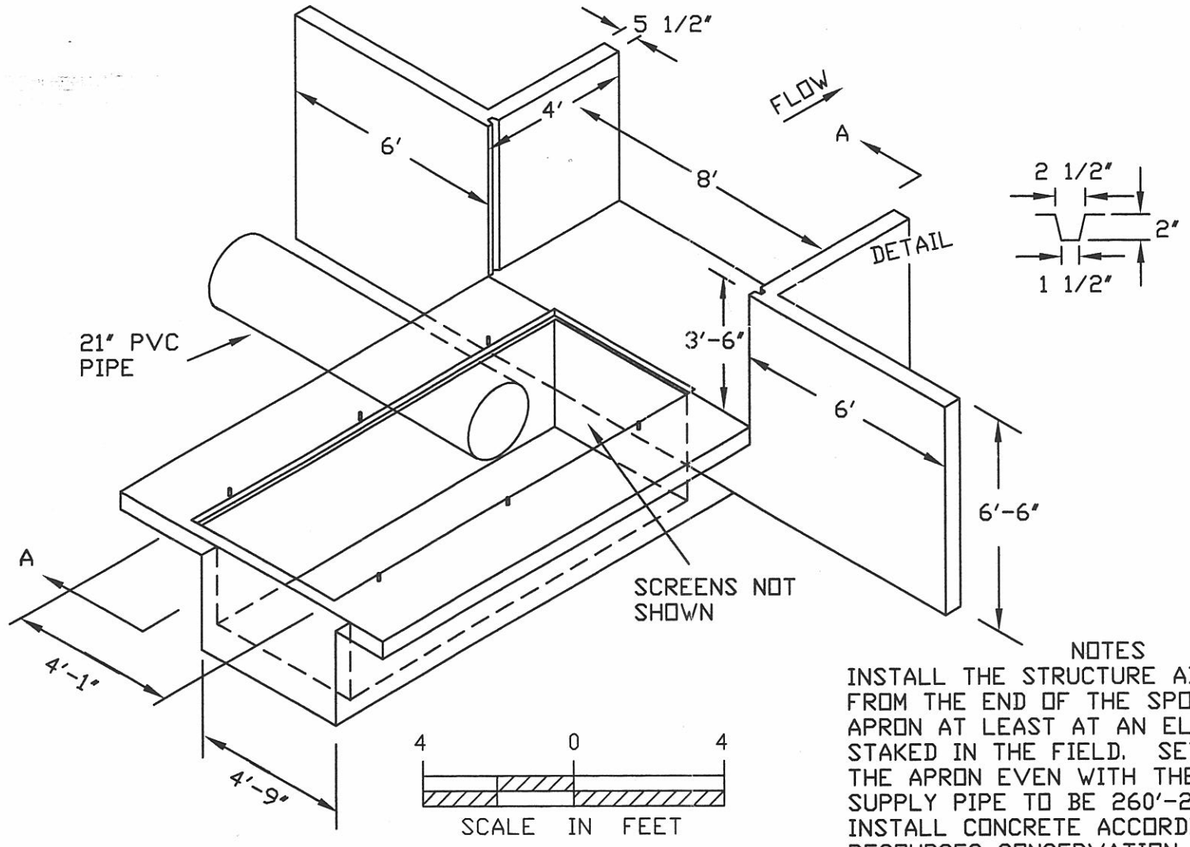
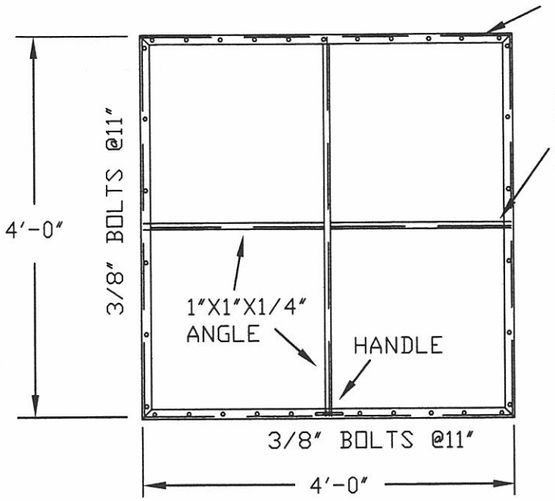
SHEET 5
OF 7

STRUCTURE PERSPECTIVE VIEW

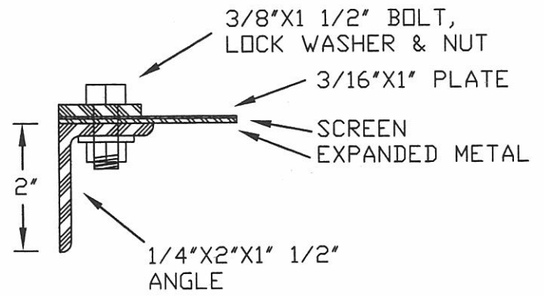


SCREEN FRAME DETAIL

3 NEEDED



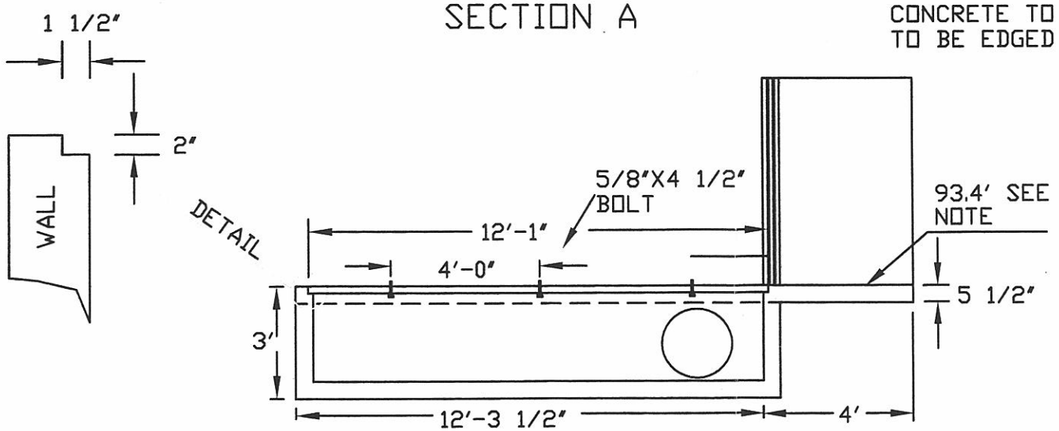
SCREEN FRAME DETAIL ELEVATION VIEW



NOTES

INSTALL THE STRUCTURE ABOUT 135' UPSTREAM FROM THE END OF THE SPOIL PILE WITH THE APRON AT LEAST AT AN ELEVATION OF 93.4' AS STAKED IN THE FIELD. SET THE ELEVATION OF THE APRON EVEN WITH THE CHANNEL BOTTOM.
SUPPLY PIPE TO BE 260'-21" CLASS 100 PVC.
INSTALL CONCRETE ACCORDING TO NATURAL RESOURCES CONSERVATION SERVICE SPECIFICATION 42, REINFORCED CONCRETE FOR MINOR STRUCTURES.
USE 4000 PSI STRENGTH CONCRETE, NEED 5.4 CU. YD.
CONCRETE TO BE VIBRATED, ALL EXPOSED EDGES TO BE EDGED WITH AN EDGING TOOL.

SECTION A



NOTE

NOTCH IS ON ALL 4 SIDES OF THE BOX.
BOLTS ARE TO HOLD DOWN THE SCREEN, USE A 1"X4"X¼"BAR WITH A 3/4" DIAMETER HOLE 1" FROM ONE END.

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OREGON
JULY 11, 1969
BERNARD J. HEWES

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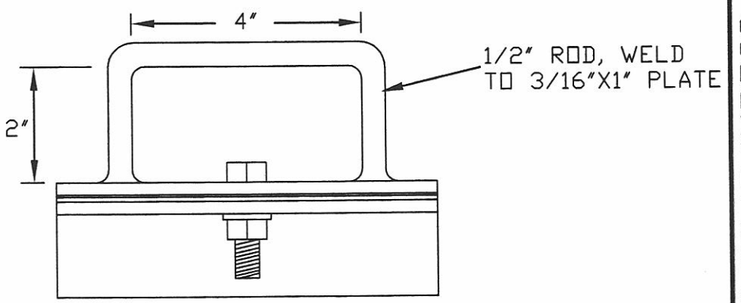
FRAME HANDLE DETAIL ELEVATION VIEW



NOTES

EXPANDED METAL TO BE CARBON STEEL, FLATTENED, 13 GAGE, 3/4" SHORT OPENING WIDTH.
SCREEN TO BE TYPE 304 STAINLESS STEEL, 20 GAGE MINIMUM WITH 3/32" HOLES SPACED 5/32" STAGGERED.

B. Hewes 8/21/2008 11:20 AM whitescreen.dwg

DESIGNED B. HEWES DATE 12/07
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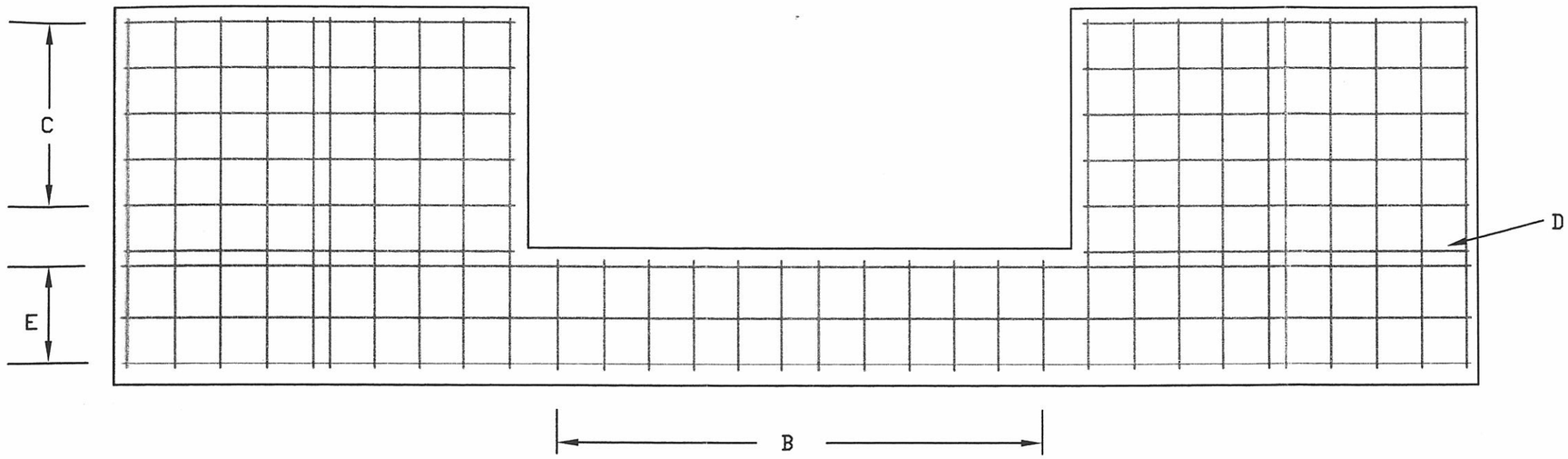
CHECK & SCREEN STRUCTURE
UMATILLA COUNTY, OREGON
R H ENGINEERING

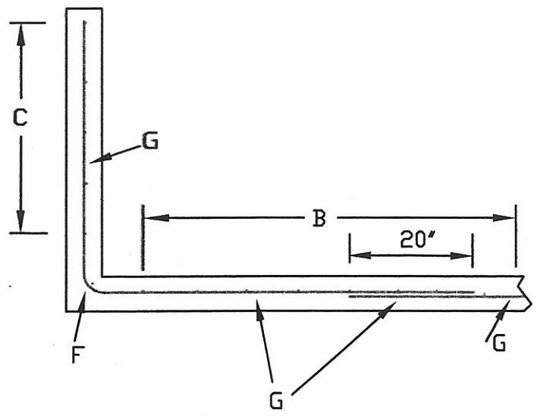
CAD FILE whitescreen

SHEET 6 OF 7

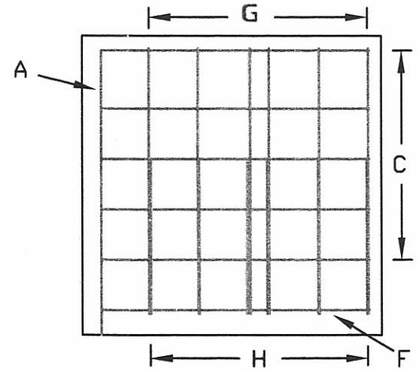
HEADWALL LOOKING DOWNSTREAM
ELEVATION VIEW



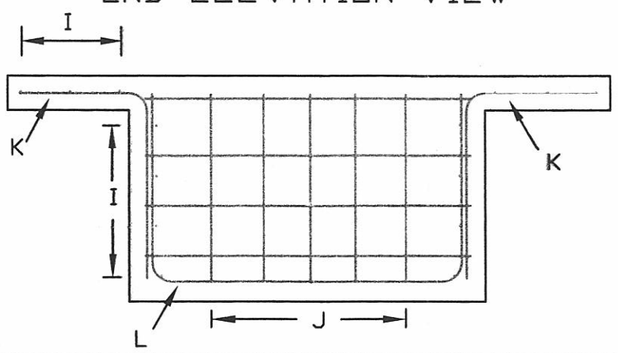
DOWNSTREAM SIDE WALL AND APRON
END ELEVATION VIEW



SIDE ELEVATION VIEW



SCREEN BOX
END ELEVATION VIEW



REINFORCING STEEL SCHEDULE

ALL NUMBER 4 BARS, 8" NOMINAL SPACING

BAR	NO.	SHAPE	A	B	C
A	20	STRAIGHT	6'-1"	--	--
B	12	A B	2'-7"	3'-7"	--
C	10	A B	5'-7"	3'-9"	--
D	2	STRAIGHT	5'-8"	--	--
E	3	STRAIGHT	19'-8"	--	--
F	2	STRAIGHT	3'-7"	--	--
G	12	A B	3'-7"	5'-1"	--
H	12	A B	2'-0"	2'-0"	--
I	14	STRAIGHT	12'-0"	--	--
J	5	A B	2'-6"	3'-8"	--
K	38	A B	1'-9"	2'-6"	--
L	19	A B C	2'-6"	4'-3"	2'-6"

1080 FEET NEEDED WITHOUT ANY WASTE

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

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REINFORCING STEEL DETAILS
UMATILLA COUNTY, OREGON
B H ENGINEERING

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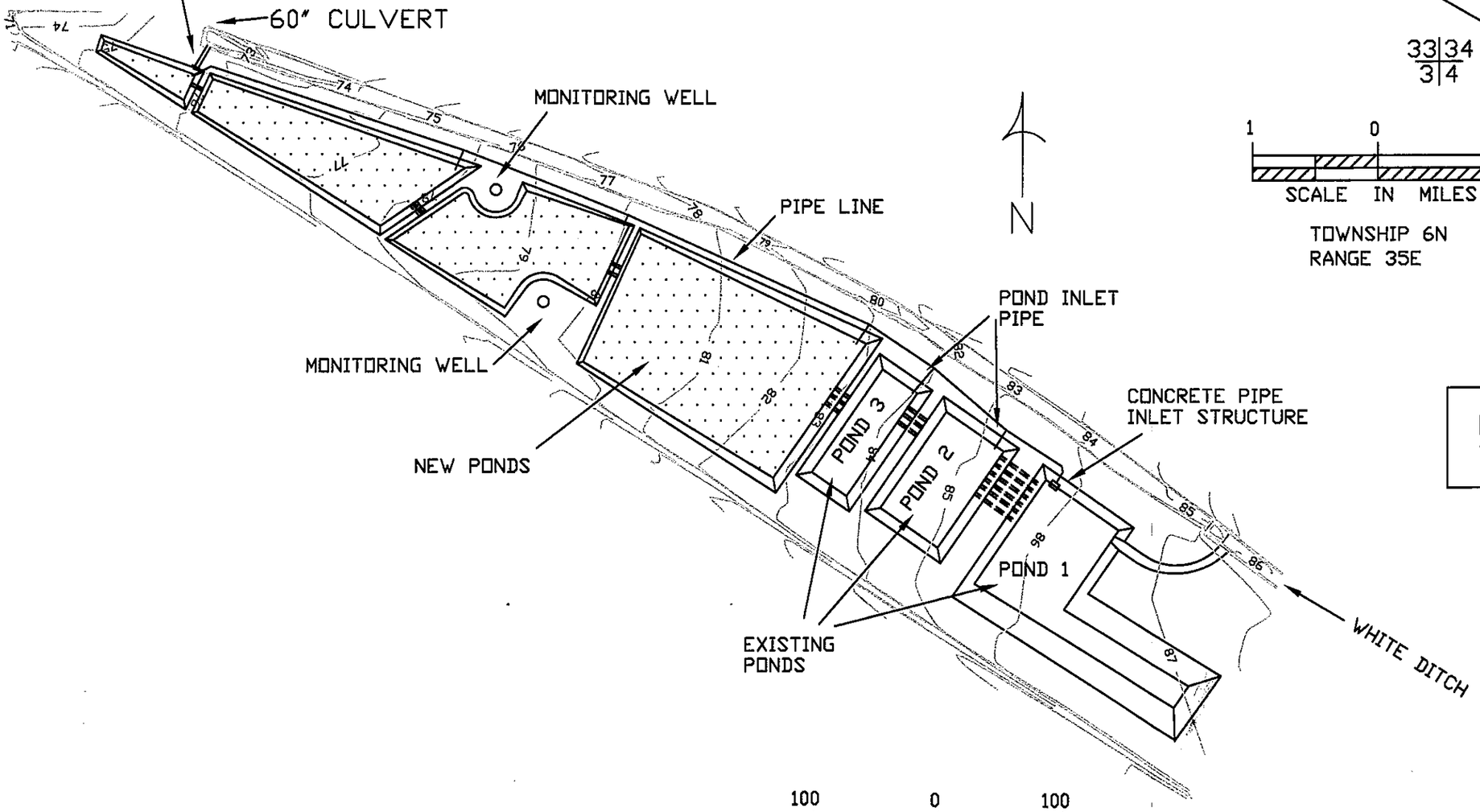
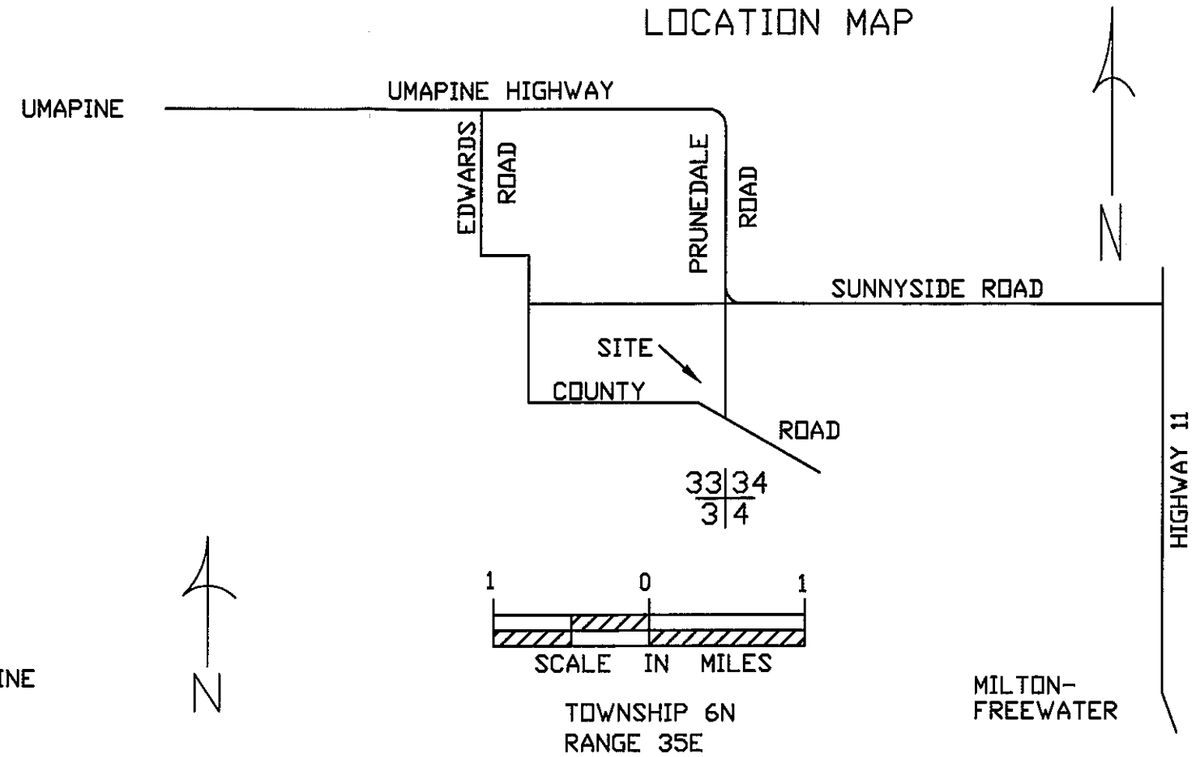
SHEET 7 OF 7

SITE PLAN VIEW



LOCATION MAP



PRELIMINARY SUBJECT TO REVISION

REGISTERED PROFESSIONAL ENGINEER 6476 OREGON JULY 11, 1969 BERNARD J. HEWES

EXPIRES 6/30/2011

DATE 9/09

DESIGNED B. HEWES

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APPROVED

WWBWC/HBDIC LOWER RECHARGE PROJECT
LOCATION MAP & SITE MAP
UMATILLA COUNTY, OREGON

B H ENGINEERING

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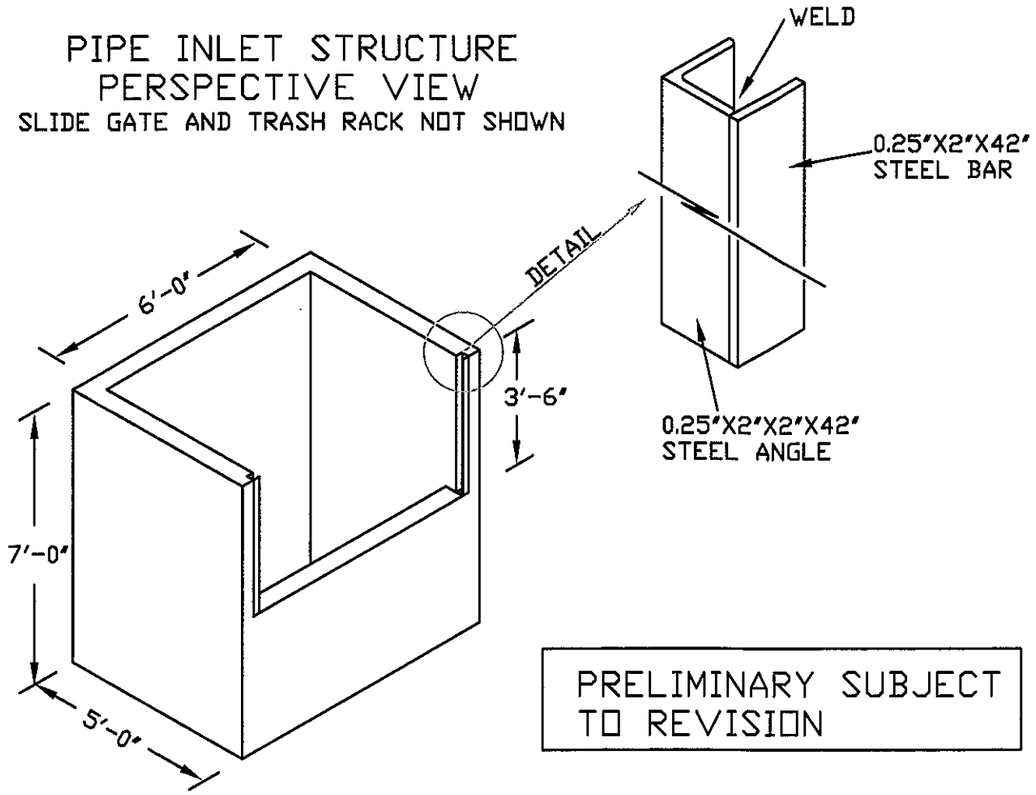
SHEET 1 OF 4

PIPE INLET STRUCTURE PERSPECTIVE VIEW

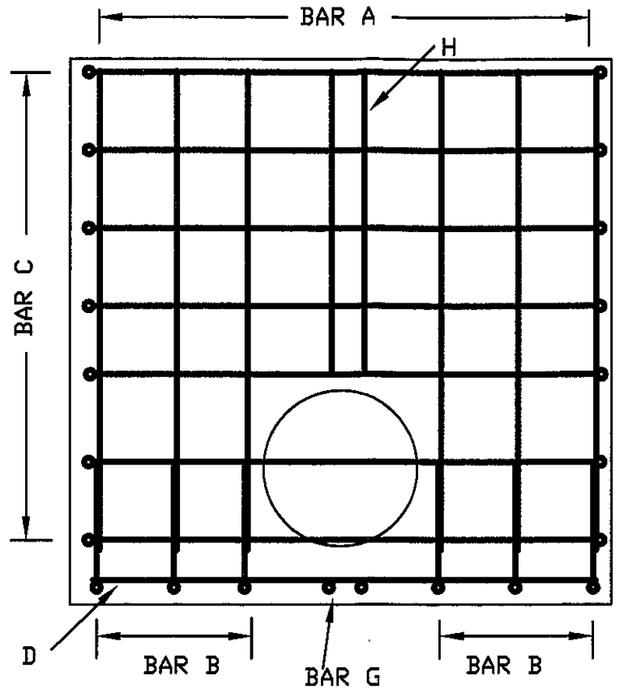
SLIDE GATE AND TRASH RACK NOT SHOWN



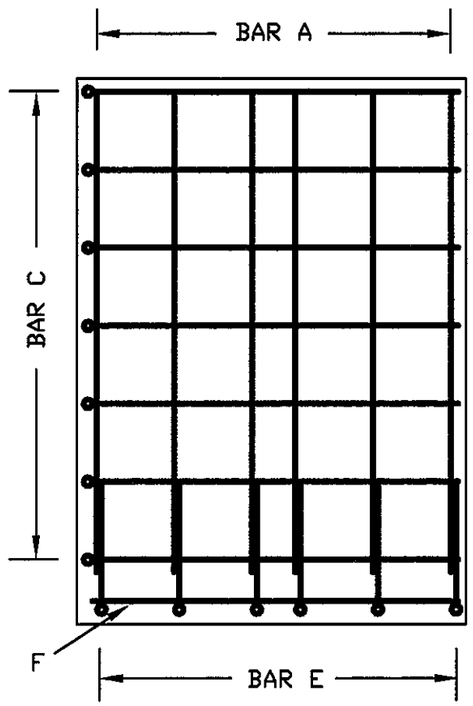
PRELIMINARY SUBJECT TO REVISION

REINFORCING STEEL DETAILS

BACK ELEVATION VIEW

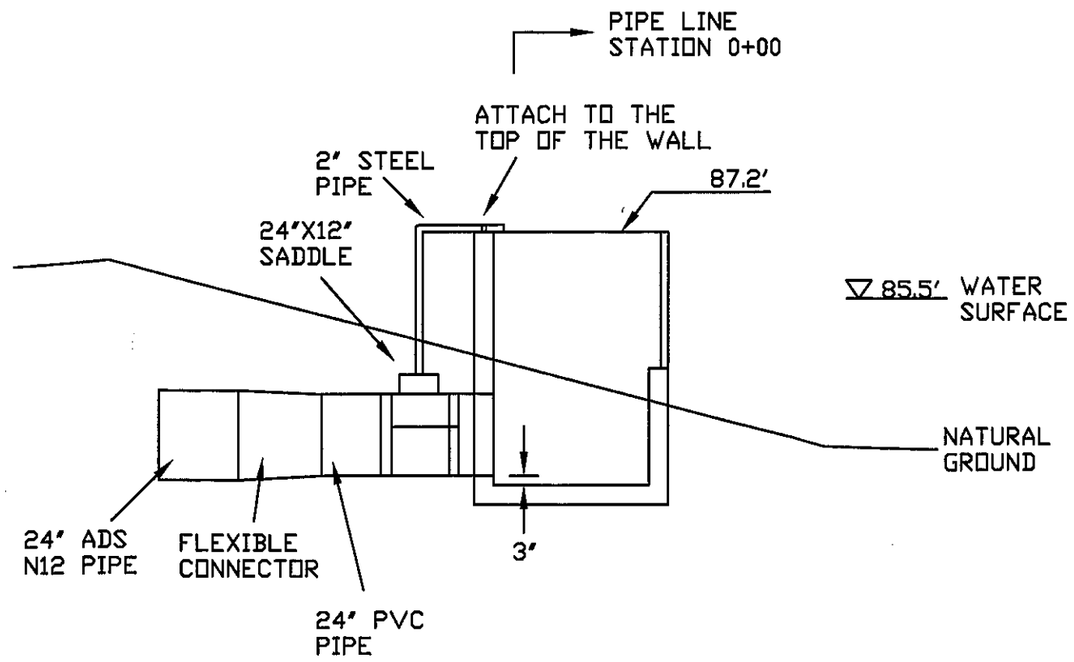


SIDE ELEVATION VIEW



CROSS SECTION VIEW

SLIDE GATE AND TRASH RACK NOT SHOWN



REINFORCING STEEL SCHEDULE

ALL NUMBER 4 BARS, 12" NOMINAL SPACING

BAR	NO.	SHAPE	A	B	C
A	18	straight	6'-2"	--	--
B	6	A B C	1'-7"	6'-6"	3'-1"
C	7	A B C	4'-7"	6'-6"	4'-7"
D	2	straight	6'-6"	--	--
E	6	A B C	1'-7"	6'-6"	1'-7"
F	2	straight	4'-6"	--	--
G	2	A B	6'-6"	3'-1"	--
H	2	straight	3'-11"	--	--

NOTES

INSTALL THE PIPE INLET STRUCTURE ACCORDING TO CONSTRUCTION SPECIFICATION 42, REINFORCED CONCRETE FOR MINOR STRUCTURES, USE 4000 PSI STRENGTH CONCRETE, APPROXIMATELY 3.0 CU. YD. NEEDED.
REINFORCING STEEL TO BE #4 BARS, NEED 400 FEET ASSUMING NO WASTE.

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2011

DATE 10/09
DESIGNED B. HEWES
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APPROVED

WWBWC/HBDIC LOWER RECHARGE PROJECT
PIPE INLET STRUCTURE
UMATILLA COUNTY, OREGON
B H ENGINEERING

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SHEET 2
OF 4

NOTES

PIPE NEEDS:
5'-24" CLASS 80 PVC PIPE
80'-24" ADS N12 CORRUGATED POLYETHYLENE PIPE
80'-18" " "
60'-15" " "
200'-12" " "
140-10" " "
220'-6" " "

N

0+00 PIPE INLET
0+05 FLEXIBLE COUPLER
0+10-24"-45° ELBOW
0+15-24"-45° ELBOW

20'-15" PIPE TO POND 2

0+70-24"X24"X15" TEE
0+80-24"X18" REDUCER

20'-12" PIPE TO POND 3

1+50-18"X18"X12" TEE
1+60-18"X15" REDUCER

20'-15" PIPE TO POND 6

2+05-15"X15"X15" TEE
2+20-15"X12" REDUCER

20'-10' PIPE TO POND 7

4+15-12"X12"X10" TEE
4+20-12"X10" REDUCER

20'-10" PIPE TO POND 8

5+55-10"X10"X10" TEE
5+60-10"X6" REDUCER

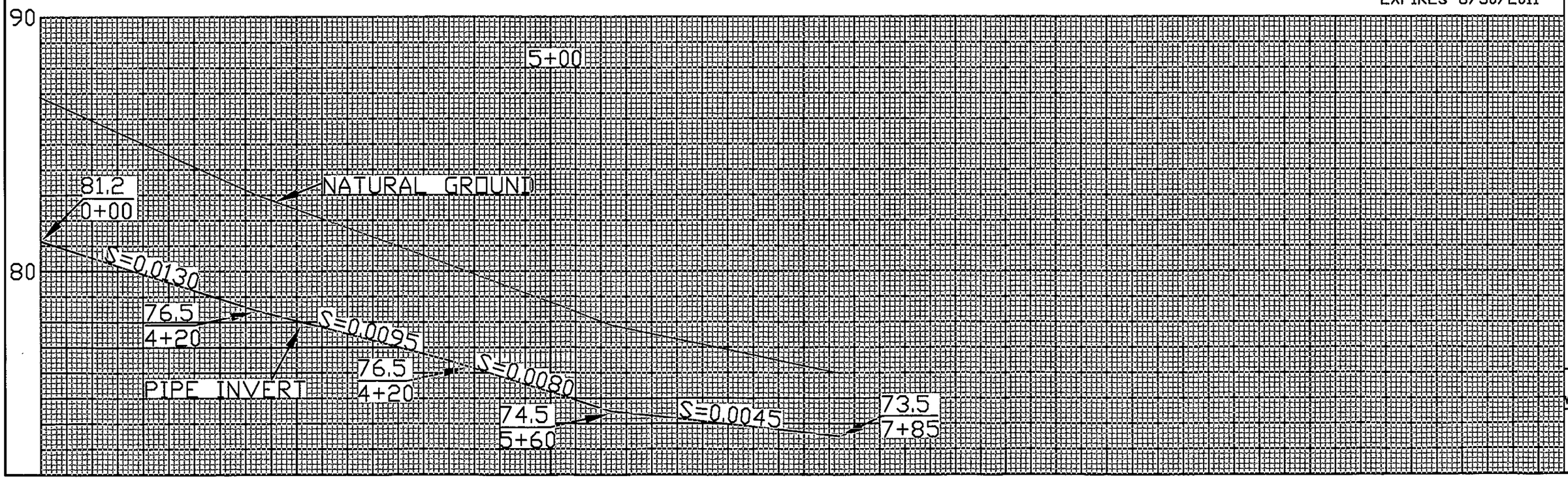
7+65-45° ELBOW
7+85 END OF PIPE
AT POND 9

PRELIMINARY SUBJECT TO REVISION

100 0 100
SCALE IN FEET

REGISTERED PROFESSIONAL ENGINEER
6476
OREGON
JULY 11, 1969
BERNARD J. HEWES

EXPIRES 6/30/2011



DATE
DESIGNED B. HEWES 10/09
PLOTTED
APPROVED

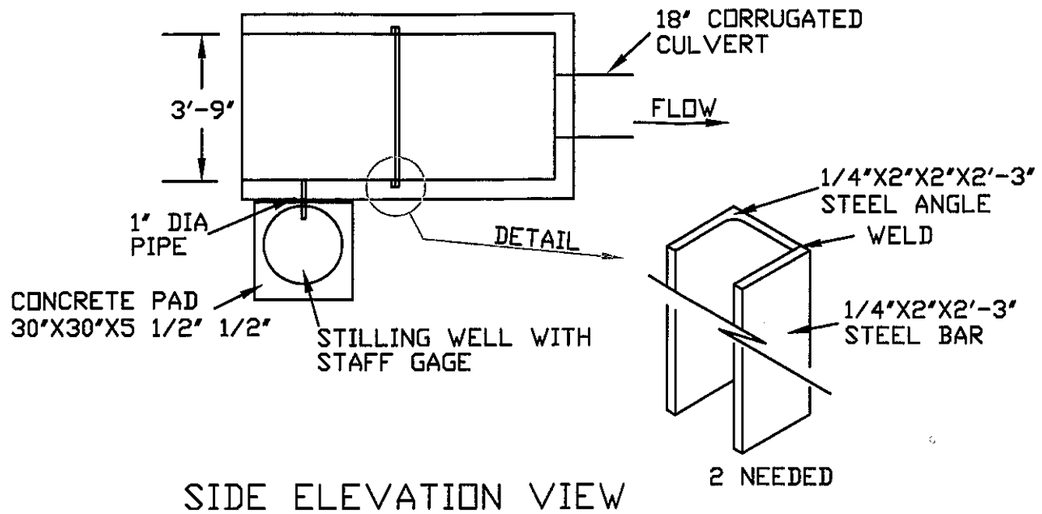
B. Hewes 11/14/2005 8:04 AM bhebanderkappdwg

WWBWC/HBDIC RECHARGE PROJECT
POND SUPPLY PIPE PLAN & PROFILE
UMATILLA COUNTY, OREGON

CAD FILE
whitelowpipe

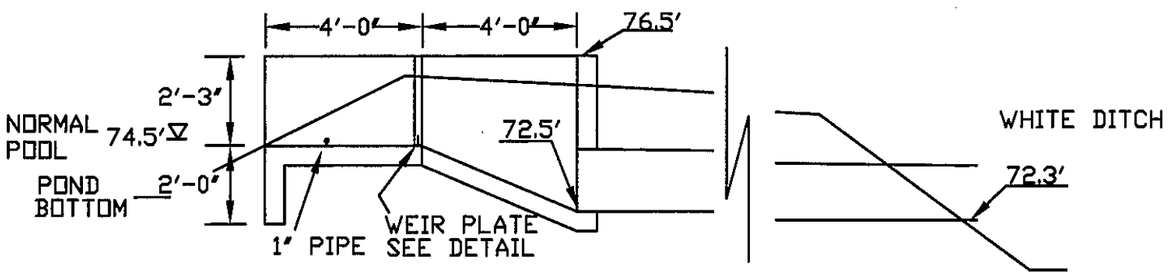
SHEET 3
OF 4

POND EMERGENCY OUTLET PLAN VIEW



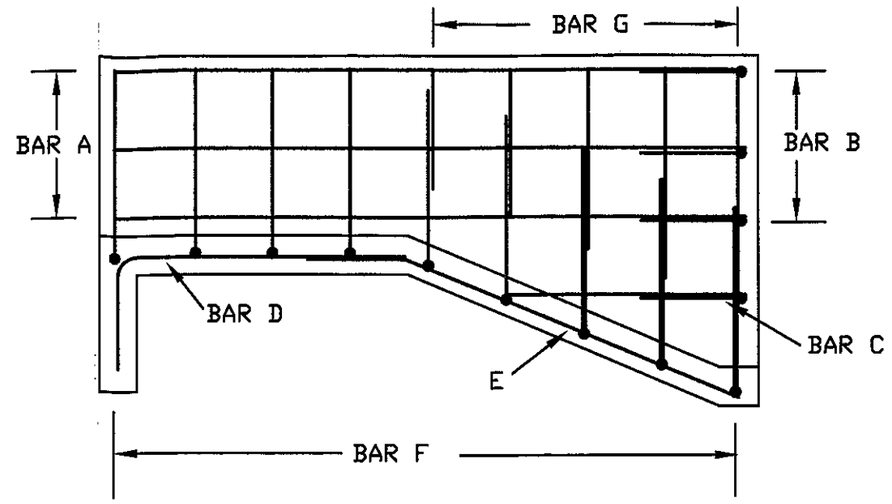
SIDE ELEVATION VIEW

STILLING WELL NOT SHOWN

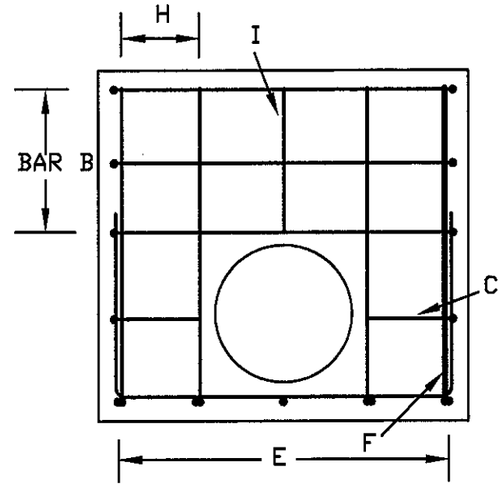


PRELIMINARY SUBJECT TO REVISION

REINFORCING STEEL DETAILS SIDE ELEVATION VIEW



PIPE INLET END ELEVATION VIEW



NOTES

INSTALL CONCRETE IN ACCORDANCE WITH CONSTRUCTION SPECIFICATION 42, "REINFORCED CONCRETE FOR MINOR STRUCTURES". USE 4000 PSI STRENGTH CONCRETE, NEED ABOUT 2.2 CU. YD.
REINFORCING STEEL ALL #4 BARS, NEED 260 FEET WITH NO WASTE.
CULVERT PIPE MAY BE STEEL OR HIGH DENSITY POLYETHYLENE.
SET THE WEIR PLATE IN A RABBET CUT INTO A 1 1/2"X1 3/4" BOARD AND SET INTO THE SOCKETS. THE WEIR PLATE TO BE STEEL 1/8"X3"X48".
SET THE STILLING WELL AT LEAST 2" INTO THE CONCRETE BASE. USE A MINIMUM PIPE DIAMETER OF 18" EITHER PVC OR STEEL.
SET THE STAFF GAGE ZERO POINT IN THE STILLING WELL LEVEL WITH THE CREST OF THE WEIR PLATE. INSTALL THE 1" PIPE TO THE STILLING WELL WITH 1" BETWEEN THE FLOOR AND PIPE.

REINFORCING STEEL SCHEDULE

ALL #4 BARS, 12" NOMINAL SPACING

BAR	NO.	SHAPE	A	B	C
A	6	straight	7'-8"	--	--
B	3	A B C	1'-3"	4'-3"	1'-3"
C	2	A B	1'-3"	1'-1"	--
D	5	A B	1'-6"	4'-0"	--
E	5	A B	1'-3"	4'-8"	--
F	9	A B C	2'-4"	4'-3"	2'-4"
G	10	straight	varies	--	--
H	4	A B	1'-3"	4'-1"	--
I	1	straight	1'-10"	--	--

REGISTERED PROFESSIONAL ENGINEER 6476 OREGON JULY 11, 1969 BERNARD J. HEWES

EXPIRES 6/30/2011

Bernard Hewes, r/a 10/15/2009 11:09 AM whitelowweir.dwg

DESIGNED B. HEWES DATE 10/09
CHECKED
APPROVED

WWBWC/HBDIC LOWER RECHARGE PROJECT
EMERGENCY SPILLWAY WEIR
UMATILLA COUNTY, OREGON
B H ENGINEERING

CAD FILE whitelowweir

SHEET 4 OF 4

HBDIC Recharge Project Site

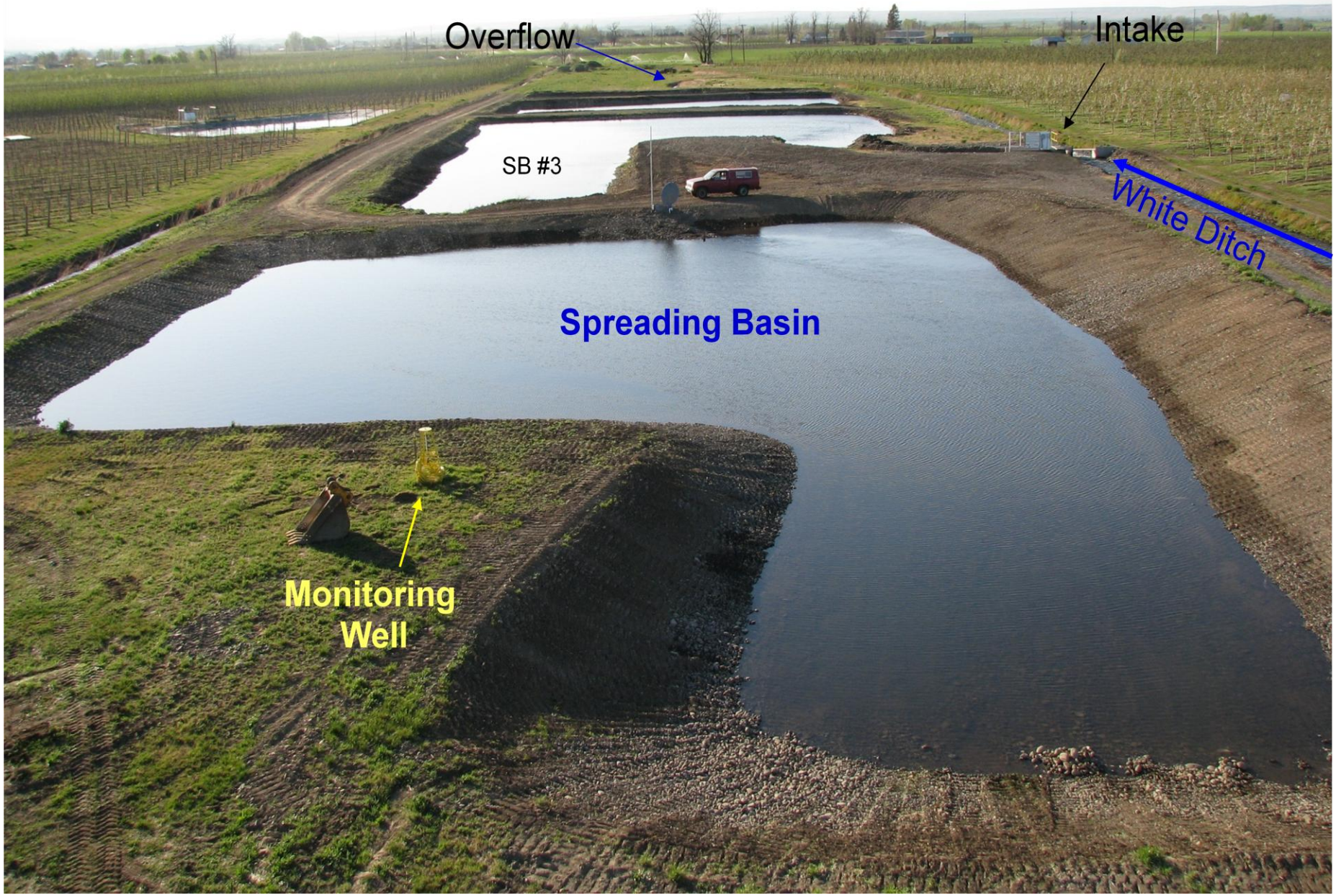
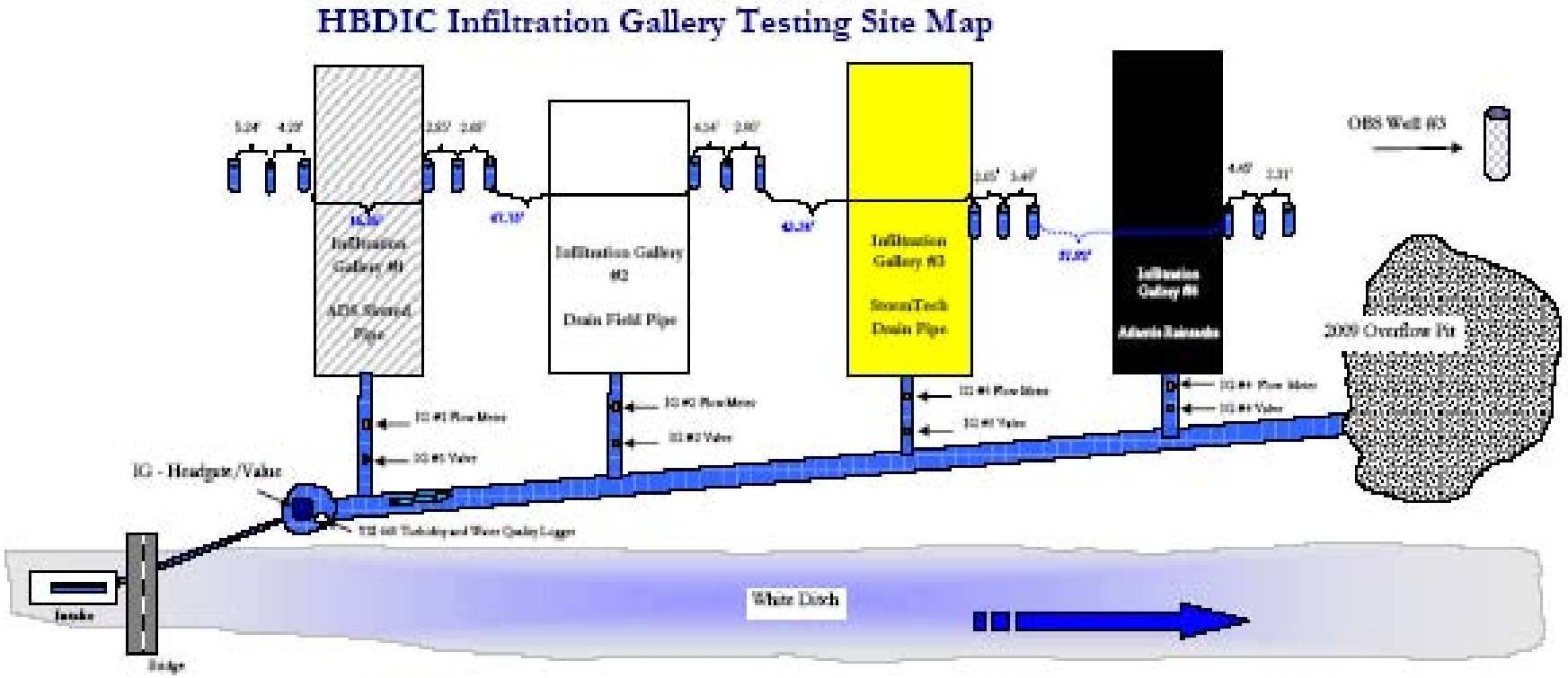
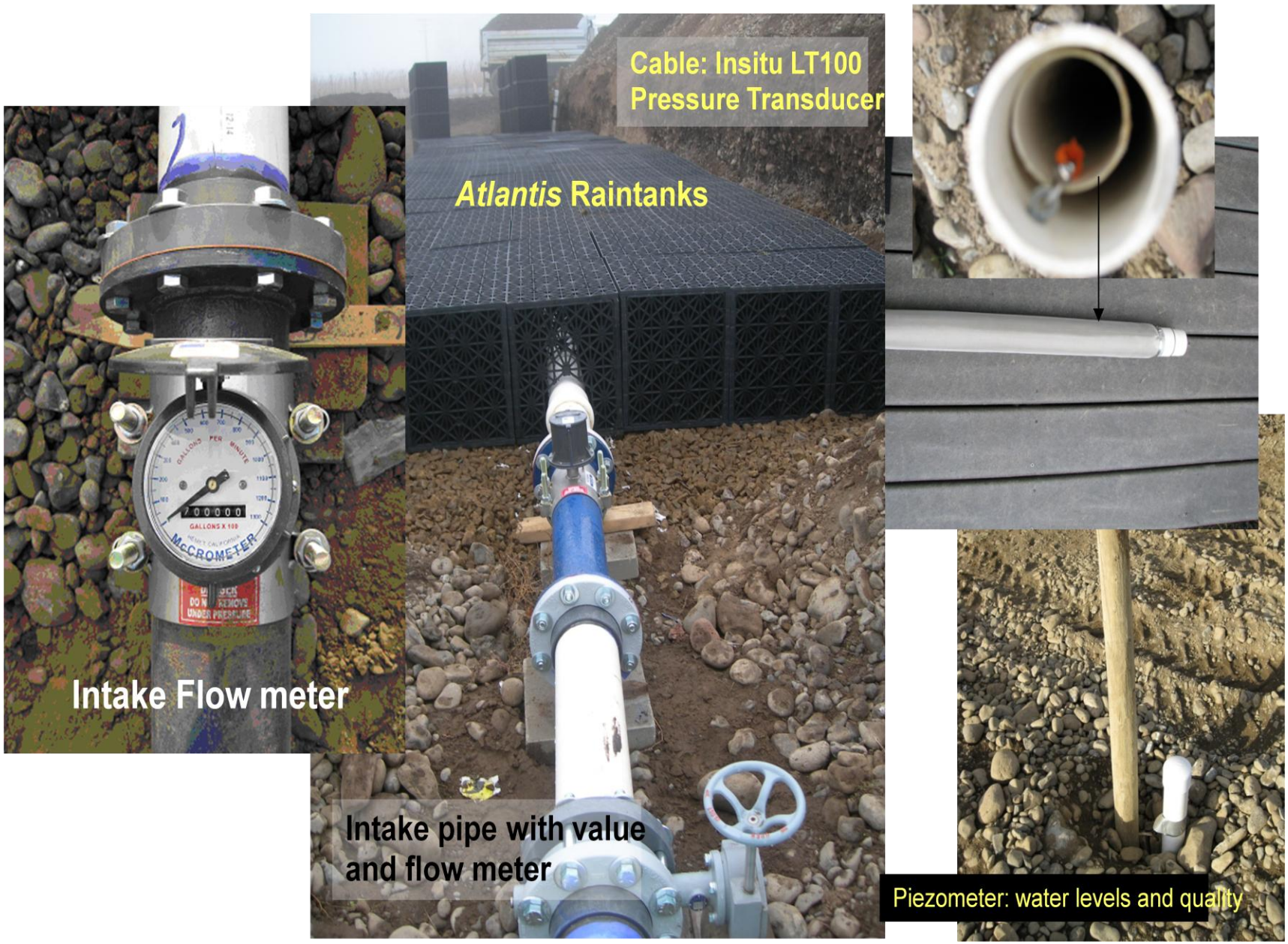


Figure 12



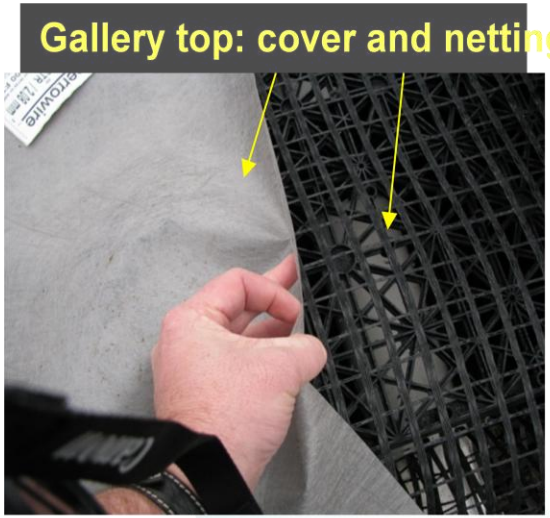
During the 2008-2009 Recharge Season, infiltration galleries are being tested at the HBDIC Recharge site, near Milton-Freewater Oregon. Preliminary testing results indicate infiltration galleries are viable recharge mechanism for areas where spreading basins are not feasible. A combination of all methods will be assessed during the design and siting phase of this program.

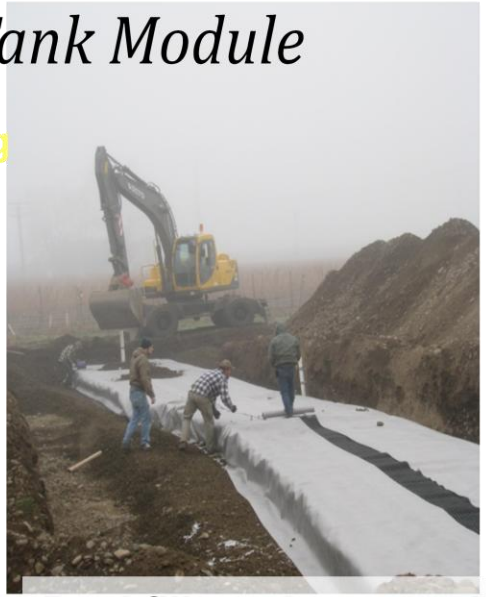
Infiltration Gallery Instrumentation



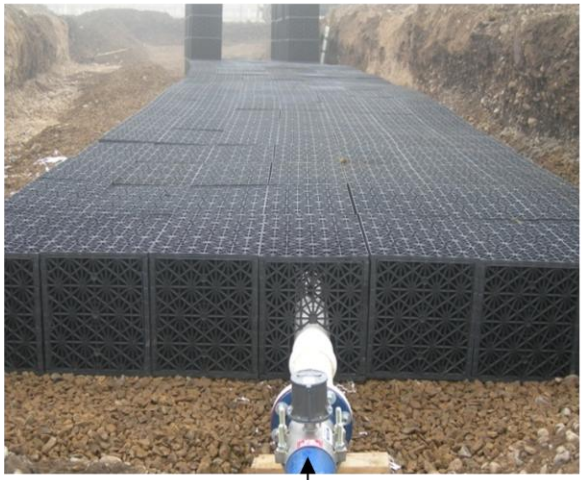
Infiltration Galleries: *Atlantis® D-Raintank® Tank Module*

Raintanks being deployed





Backfill: native materials



Intake: Value and metered

ADS Slotted Pipe

ADS Slotted Pipe Installation

StormTech Drain Pipe

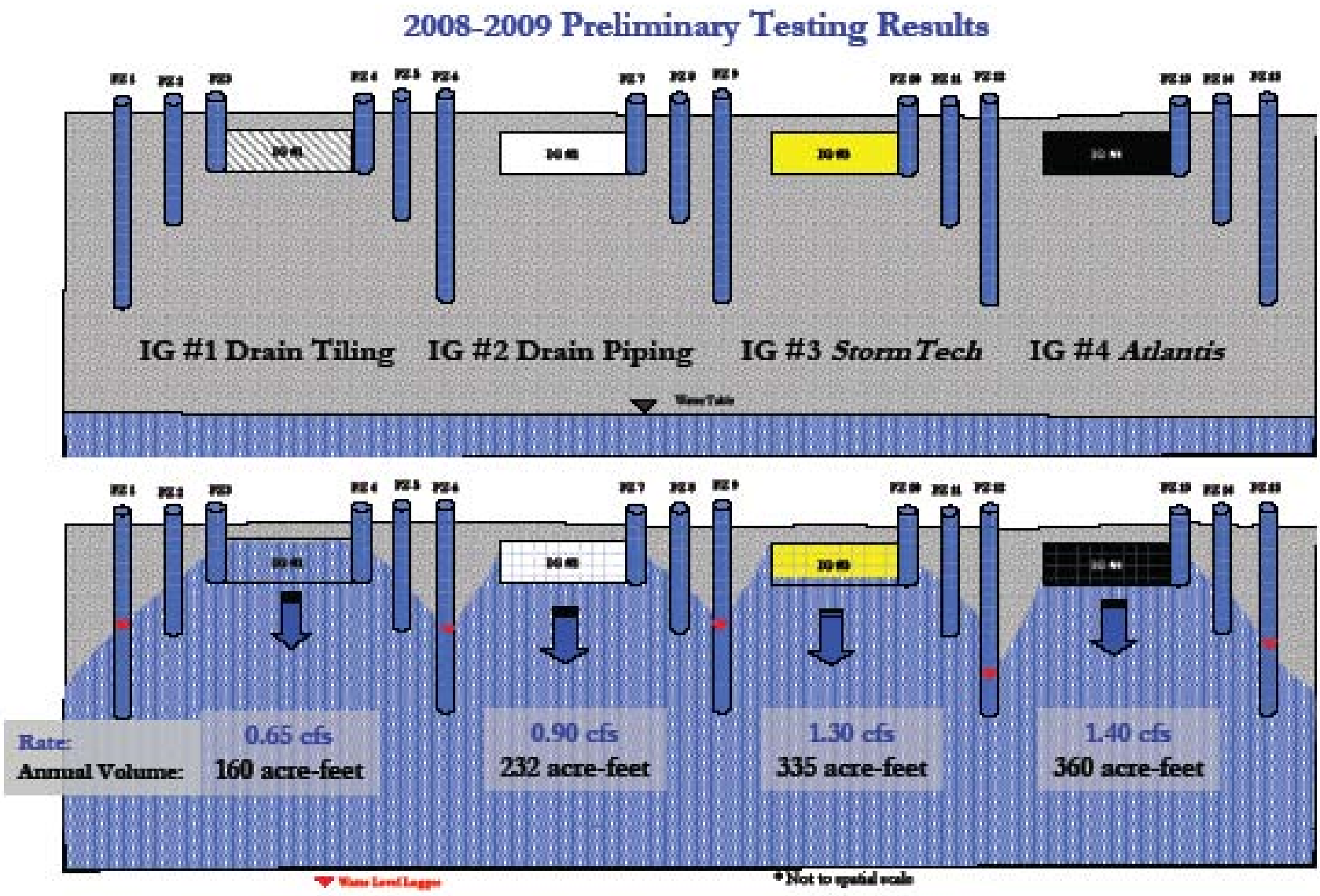
StormTech Drain Pipe Installation

Figure 16

Infiltration Gallery: *Stormtech* SC-740™ Chamber

Figure 13

HBDIC Infiltration Gallery Testing Site: Profile of Galleries and Piezometers



Turnout structure for spreading basins during construction

Turnout strucutre for spreading basins

Installation of observation well at HBDIC recharge site

Screened water intake for infiltration galleries and bridge over white ditch for brushing off any accumulated debris during operations