Draft Data Summary Report

Simplot Grower Solutions
J.R. Simplot Company

Sunnyside, Washington
August 2019

Draft Data Summary Report

Simplot Grower Solutions
South 300 1st Street
Sunnyside, Washington 98944

August 2019

Prepared by:
HDR Engineering, Inc.
412 East Parkcenter Blvd, Ste 100
Boise, Idaho 83706

Prepared by:

Michael R. Murray, Ph.D.
Project Manager

Table of Contents

List of Figures

List of Tables

List of Appendices

Acronyms

AO	Agreed Order
BDL	below detection limit
bgs	below ground surface
City	City of Sunnyside
CLARC	Cleanup Levels and Risk Calculation
COC	chemical of concern
CRBG	Columbia River Basalt Group
Ecology	Washington Department of Ecology
EPA	U.S. Environmental Protection Agency
ft/ft	feet per foot
HDR	HDR Engineering, Inc.
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTCA	Models Toxic Control Act
Simplot	J.R. Simplot Company
Simplot Soilbuilders	Former name of Simplot Grower Solutions
Stantec	Stantec Consulting Corporation
SVID	Sunnyside Valley Irrigation District
VOC	volatile organic compound
WAC	Washington Administrative Code

1 Introduction

The J.R. Simplot Company (Simplot) entered into an Agreed Order (AO) (No. DE 16446, effective date June 26, 2019) with the Washington Department of Ecology (Ecology) to complete a Remedial Investigation (RI)/Feasibility Study (FS), and to prepare a Draft Cleanup Action Plan (DCAP) for the Simplot Grower Solutions (formerly named Simplot Soilbuilders) Sunnyside site, located at 300 1st Avenue, Sunnyside, Washington.

As a first step, Simplot is to prepare this data summary report that describes facility information, history and conditions, and past investigation activities. The scope of work for the data summary report is outline in the AO.

The report is organized as follows:

Section 1 Introduction – provides the purpose of the report.

Section 2 Site Background – provides site setting, area setting, soils, groundwater information.

Section 3 Site Investigations – reviews past investigations conducted at the site.

Section 4 Screening Assessment – examines soil and groundwater cleanup standards.

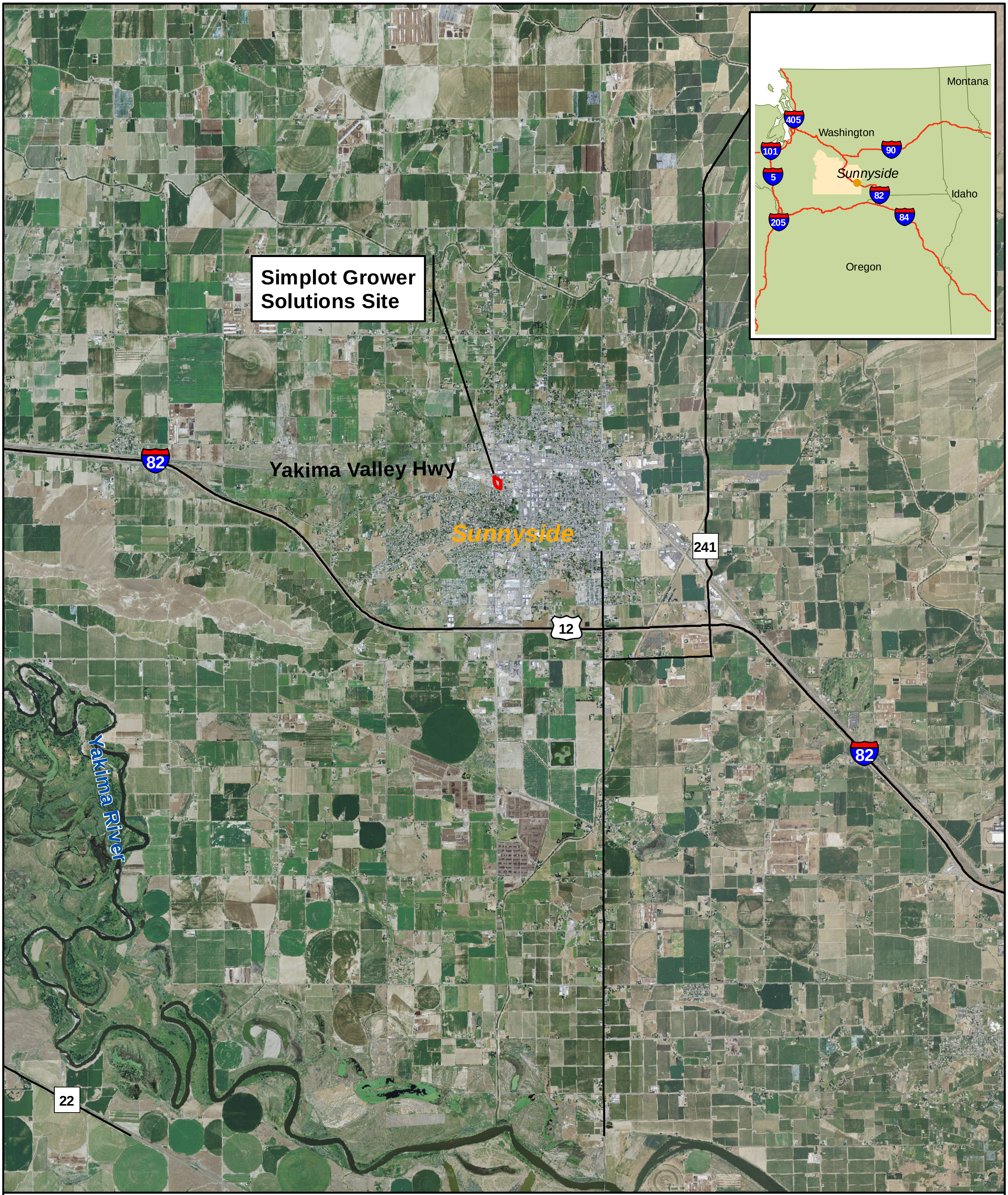
2 Site Background

On October 1, 2008, Simplot received an Early Notice Letter from Ecology regarding the potential release of hazardous substances from Simplot's facility at 300 South 1st Street, Sunnyside, Washington **(Figure 1** and **Figure 2**). Ecology's findings were based on information provided by Stantec Consulting Corporation (Stantec), a consulting firm contracted by Chevron Environmental Management Company (CEMC) and Atlantic Richfield Company (ARCO, now known as BP). Stantec had investigated the Bee-Jay Scales site, located at 116 North 1st Street, one block north of the Simplot facility (**Figure 2**). In spring 2007, Stantec investigated off-site groundwater to further assess the extent of groundwater impacts associated with the Bee-Jay Scales site. They drilled a boring adjacent to the east side of Simplot's property and collected groundwater samples; the samples were analyzed and several constituents exceeded groundwater quality standards. This finding triggered Ecology to request that Simplot investigate the Grower Solutions facility.

Simplot contracted HDR Engineering, Inc. (HDR) to initiate on-site investigation activities in 2009. **Table 2-1** presents the timeline of events starting in 2008 with the Early Notice Letter from Ecology to Simplot through July 2019.

Simplot's Sunnyside facility is an agricultural distribution facility that began at its current location in the early- to mid-1960s. It is a retail outlet for agri-chemicals (fertilizers, pesticides, soil amendments).

In 2011, Simplot removed the main warehouse, office building, fertilizer storage tank area, and associated containment systems, and replaced them with a new office and concrete basin containment structure. A maintenance shop also remains on site. **Figure 2** illustrates site conditions in 2006 prior to reconfiguring the buildings and **Figure 3** illustrates current site conditions.



0 0.5 1 1.5
Miles

Figure 1: Vicinity Map
Simplot Grower Solutions, Sunnyside, WA

Imagery: 2009 NAIP 1 meter resolution
Source: NRCS/USDA Digitial Gateway

Map Date: Friday, May 18, 2012
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

HDR ONE COMPANY Many Solutions℠

Figure 2: Site Map 2006

Simplot Grower Solutions, Sunnyside, WA

Imagery: 2006 1 Meter NAIP
Source: University of Washington

Map Date: Thursday, April 30, 2009
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

HDR ONE COMPANY *Many Solutions*℠

Figure 2: Site Map 2018
Simplot Grower Solutions, Sunnyside, WA

Imagery: ESRI World Imagery Map Service, Image Date 10/18/2018
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Map Date: Monday, August 5, 2019
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

Table 2-1. Site Timeline Early Notice Letter to Present

Year	Date	Event
2008	October 1	Early Notice Letter from Ecology to Simplot.
2008	February 9	Simplot letter to Ecology indicating HDR has been hired and requesting a meeting.
2009	March 19	Simplot and Ecology meeting to discuss Volunteer Cleanup Program options.
2009	May	Simplot enters Volunteer Cleanup Program with Ecology.
2009	May	*Preliminary Site Investigation Work Plan* submitted to Ecology.
2009	July 7	Ecology opinion on Work Plan in letter to Simplot.
2009	September 23 and 24	Work plan field activities conducted including using a GeoProbe for sampling of soil and groundwater.
2009	December 17	*Preliminary Site Investigation Report* submitted to Ecology.
2010	June 4	Ecology response letter to the December 17, 2009 Preliminary Site Investigation Report.
2010	July	*Monitoring Well Construction and Sampling Work Plan* submitted to Ecology. Work plan included installation of five monitoring wells and quarterly sampling for one year.
2010	December	Ecology approval of work plan.
2011	March 15 and 16	Five groundwater monitoring wells installed.
2011	March 17	First quarter groundwater sampling.
2011	April	*Monitoring Well Construction and Sampling Report* submitted to Ecology.
2011	June 30	Second quarter groundwater sampling.
2011	September 15	Third quarter groundwater sampling.
2011	December 16	Fourth quarter groundwater sampling.
2012	May	*2011 Monitoring Well Sampling Report* submitted to Ecology
2012	May 24	Simplot and Ecology meeting in Yakima discuss monitoring results and next activities including need to assess off-site subsurface drains.
2012	June	Simplot coordinated with Sunnyside, WA, and SVID on drain system layout.
2012	July	*Source Removal, Drain Evaluation, Monitoring Well Construction and Sampling Work Plan* submitted to Ecology.
2012	September 12	HDR met with SVID and Sunnyside, WA, representatives to investigate drain system and manhole access near the Simplot property. These manholes are part of the drain evaluation described in the July 2012 Work Plan.
2012	November 20	HDR letter to Ecology regarding "Modification to Source Removal and Additional Investigation Work Plan, July 2012" – recommended installation of off-site monitoring wells prior to drain study.
2012	November	Two offsite and one onsite monitoring wells installed. MW-5 abandoned due to rinsate area excavation.
2012	December 4 and 5	Rinsate area excavation and new round of well sampling including newly installed monitoring wells.
2013	February	*Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Report* submitted to Ecology.
2013	April	Supplemental drain evaluation conducted and monitoring wells sampled.
2013	July	Monitoring wells sampled.
2013	September	Supplemental Drain Evaluation and Monitoring Well Sampling Report submitted to Ecology. Report recommended meeting with Ecology to discuss next steps in project.
2013	October	Groundwater sampling, report submitted to Ecology.
2014	October	Groundwater sampling, report submitted to Ecology.

Table 2-1. Site Timeline Early Notice Letter to Present

Year	Date	Event
2015	April	Groundwater sampling, report submitted to Ecology.
2015	October	Groundwater sampling, report submitted to Ecology.
2016	April	Groundwater sampling, report submitted to Ecology.
2016	October	Groundwater sampling, report submitted to Ecology.
2017	May	Groundwater sampling, report submitted to Ecology.
2017	December	Groundwater sampling, report submitted to Ecology.
2018	April/June	Groundwater sampling, report submitted to Ecology.
2018	September	Groundwater Sampling, report submitted to Ecology
2018	December	Meeting with Ecology to discuss site, December 3
2019	June	Initiation of Agree Order
2019	August	Data Summary Report

SVID=Sunnyside Valley Irrigation District; HDR=HDR Engineering, Inc.

2.1 Site Setting

2.1.1 Simplot Grower Solutions Facility

Simplot Grower Solutions at Sunnyside, Washington, is an agricultural distribution facility that was started at the current location in the early- to mid-1960s. Simplot Grower Solutions is a retail outlet for agri-chemicals (fertilizers, pesticides, soil amendments) and offers customized fertilizer blending, application services, and consulting.

The site is in Yakima County, Washington, and is comprised of three parcels:

- Parcel Address: 300 S 1st St. Sunnyside, WA 98944
- Owner: J.R. Simplot Company
- Parcel Numbers: 22102523445 (0.93 acres), 2210252344 (1.07 acres), 22102523445 (0.66 acres)
- Total Acreage: 2.67
- Property Type: Commercial
- Zoning: M1 (light industrial)

A review of historic records for the Simplot Grower Solutions Sunnyside facility found information dating back to 1965. Based on a 1965 historic topographic map, the Simplot site had one building and the site was outside the corporate city limits of Sunnyside (City). Historic aerial photographs from 1973, 1982, 1990, 1996, and 2006 (Appendix A) are summarized in **Table 2-2.**

Table 2-2. Summary of Historic Aerial Photographs

Aerial Photograph[1]	Description
1973 (1:6000)	Rail track spur on north border of Simplot site. Two buildings on-site, a larger building near the railroad (office and warehouse), and a smaller building (shop) toward the center of the site.
1982 (1:12000)	Aerial resolution is poor and difficult to discern site features.
1990 (1:12000)	Appears similar to 1973 photograph, one building (warehouse) on the north end of property and a smaller building toward the center of the site.

Table 2-2. Summary of Historic Aerial Photographs

Aerial Photograph[1]	Description
1996 (1:9000)	Consistent with 1973 photographs. A structure is present near the northeast corner of the site that corresponds to the current day above ground storage tanks. These tanks hold liquid fertilizer.
2006 (1:6420)	Consistent with previous aerials, warehouse and office building shop, and tank farm present and illustrated in Figure 2.
Figure 3	In 2011, Simplot removed the main warehouse, office building, fertilizer storage tank area, and associated containment systems, and replaced them with a new office and concrete basin containment structure. The shop remains.

[1]Historic aerial photographs presented in Appendix A and Figure 3 presented in main body of this report.

Historic city, cross-referenced, and telephone business directories indicate that Simplot Soilbuilders (former name for Grower Solutions) was present at the site at least as early as 1968. The 1963 directories, the earliest available to HDR, did not list the address.

Based on a site visit and interviews with on-site personnel, the only structures on site have ever been the office/warehouse building (northwest corner of property, the shop (west middle portion of property), and liquid fertilizer aboveground storage tanks and containment. There was an unlined equipment rinse area located on the eastern end of the site, just south of the storage tanks shown in **Figure 2**. This area was gravel and rinsate entered into the gravel without containment. This practice of rinsing equipment into the gravel ceased in the 1990s. The shop building is used for equipment repair and maintenance and has no floor drains. There are no known bulk fuel tanks on site. There are no known wells on site. Potable water is provided by the City. The presence of a septic drain field is unknown; though sewer services are provided by the City.

As described above, Simplot replaced the original office/warehouse building in 2011 with a smaller office on the north portion of property (**Figure 3**) and built a new tank area (middle of property). The original shop building remains.

2.2 Area Setting

Land use in the general area (**Figure 1** and **Figure 3**) has included agricultural warehouses, lumber yards, coal storage, and railroad transportation starting in the early 1900s. An agricultural distribution facility was operated at the current Bee-Jay Scales site from the early 1960s to 1986. The site's former owners are currently under an AO with Ecology for remedial action. The Simplot site and surrounding properties are zoned M1 – light industrial.

The Simplot site and the City are located in a relatively flat valley that rises in topography to Snipes Mountain to the southwest and hilly areas to the north. The elevation of the Simplot site is approximately 740 feet above sea level. The base of Snipes Mountain is located approximately 500 feet southwest of the site. The mountain rises approximately 250 feet above the elevation of the Simplot site to an elevation of about 990 feet. The Yakima River is located approximately 4 miles southwest of the Simplot site. The City receives an average of approximately 7.49 inches of precipitation per year (https://www.usclimatedata.com/climate/sunnyside/washington/united-states/uswa0439). The maximum average monthly precipitation occurs in December at 1.26 inches. The driest month is July with an average precipitation of 0.16 inches. Minimum average temperatures occur in January, while maximum average temperatures occur in July. **Table 2-3** summarizes City precipitation and temperature averages.

Table 2-3. Summary of Climatological Characteristics for the City of Sunnyside

Month	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)	Average Precipitation (in)
January	26	41	0.91
February	28	49	0.63
March	34	59	0.59
April	39	67	0.59
May	47	76	0.59
June	53	83	0.55
July	57	91	0.16
August	55	90	0.24
September	47	81	0.43
October	38	67	0.63
November	31	51	0.91
December	24	39	1.26

Source: https://www.usclimatedata.com/climate/sunnyside/washington/united-states/uswa0439
°F = degrees Fahrenheit; in = inches

2.2.1 Soils

According to the Natural Resources Conservation Service (NRCS), the Simplot site and adjoining properties are mainly comprised of Cleman very fine sandy loam and Outlook fine sandy loam, together making up approximately 80 percent of nearby soil composition. These soils possess moderately high to high hydraulic conductivity, moderate to high water capacity, and the depth to the water table for these soils is greater than 80 inches. The Cleman soils are well drained, while the Outlook soils are somewhat poorly drained. The remaining mapped soils in the area are Warden fine sandy loams of varying slopes.

Borings conducted by HDR at the site revealed that site lithology includes predominantly brown clayey silt. Boring lithology is summarized further in Section 3.1.

2.2.2 Geologic and Hydrogeologic Conditions

The Simplot site is located within the Yakima Fold Belt of the Columbia Basin Province in Washington (DNR 2019). The Yakima Fold Belt is a region of high folding and faulting and is one of the three subprovinces of the Columbia Plateau. Sunnyside is located within the Yakima River Basin and is located along the fold axis of the Wapato Syncline (Vaccaro et al. 2009). Surface geology of the area consists of mostly unconsolidated to weakly consolidated basin-fill deposits, generally of the Ellensburg Formation, which are made up of terrace, alluvial, glacial, flood, lacustrine, and loess deposits. Underlying the basin-fill deposits and exposed in the higher areas farther outside of the valleys is the Columbia River Basalt Group (CRBG).

According to Vaccaro et al (2009), groundwater in the area is found within the unconsolidated basin-fill deposits and the CRBG (generally within the interbeds, flow surfaces, and fracture zones in the CRBG flows). Hydraulic characteristics of the aquifers in the area are diverse due to the high diversity of the basin fill and CRBG deposits. Groundwater in the area is found as either confined or unconfined and water levels in the area have some fluctuation on a seasonal basis due to human activities and variations in precipitation. Groundwater flow in the area tends to be toward the Yakima River, located south of Sunnyside.

The *Preliminary Site Investigation Report* (HDR 2009b) reported the following on-site soil and shallow groundwater conditions from GeoProbe sampling:

> *Eight of the borings included a layer of fill at the ground surface up to 2 feet deep. The subsurface soils were generally comprised of clayey silt for the majority of the boring depth, usually to approximately 12 feet below ground surface. The clayey silt was dark brown to brown, with a color change usually to gray at approximately 9 to 12 feet deep. The soil was generally dry to a depth of 2 to 3 feet, slightly moist from 2 to 5 feet, and saturated from approximately 5 feet to the bottom of the boring.*

GeoProbe boring logs and monitoring well logs are presented in Appendix B.

2.2.2.1 Area Wells

HDR conducted a search of well logs within a quarter-mile of the Simplot site to gage groundwater conditions in the area, including depth to groundwater and soil lithology. **Table 2-4** summarizes the 45 wells found in the well log search. **Table 2-5** summarizes a select seven of those wells – three east of the site, one northwest of the site, and three southeast of the site – for static groundwater depth in the area, which ranged from 6 feet northwest of the site to 8 and 12 feet east and southeast of the site, respectively. This is consistent with shallow groundwater monitored at the Simplot site during investigative activities.

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
DPRA	MW-1, MW-2, MW-3	NA	111901	NWNW, S25, T10N, R22E	NA	NE	1132.89	4/9/1991	20	NA	Fill Gray Silt	0-5 ft 5-20 ft
City of Sunnyside	#8	NA	113509	NENE, S26, T10N, R22E	Municipal	NW	1028.53	6/7/1994	375	44	clay, silt, sand, and gravel, with some occurrences of siltstone, shale, tuff, and basalt	0-440 ft
City of Sunnyside	NA	NA	296226	SWNW, S25, T10N, R22E	NA	E	316.07	1/30/1954	450	flowing	clay, silt, sand, and gravel, with some occurrences of sandstone and basalt	0-461 ft
City of Sunnyside	TW-3	ALM337	498369	SWNW, S25, T10N, R22E	Municipal Test Well	SE	889.63	9/20/2007	399.5	+23 (artesian)	clay, silt, sand, and gravel	0-397 ft
City of Sunnyside	MW-18	BHN764	885880	NWNW, S25, T10N, R22E	Resource Protection Well	NE	1132.89	8/20/2013	16	NA	silty sand	0-16 ft
City of Sunnyside	MW-20	BHN766	885884	NWNW, S25, T10N, R22E	Resource Protection Well	NE	1132.89	8/20/2013	16	NA	silty sand	0-16 ft
Cascade Natural Gas Corp/City of Sunnyside	MW #10	ABJ975	120507	SWNW, S25, T10N, R22E	Test Well	E	1207	7/15/1994	15	8	dark brown silty sand saturated at	0-15 ft 7 ft
Cascade Natural Gas Corp/City of Sunnyside	MW #11	ABJ976	120508	SWNW, S25, T10N, R22E	Test Well	E	1207	7/18/1994	15	8	dark brown silty sand saturated at	0-15 ft 7 ft

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
Cascade Natural Gas Corp/City of Sunnyside	MW #9	ABJ974	120509	SWNW, S25, T10N, R22E	Test Well	E	1207	7/15/1994	17	8	dark brown silty sand	0-17 ft
											saturated at	7 ft
Cascade Natural Gas	MW-6	NA	211874	S25, T10N, R22E	Monitoring Well	E	1207	7/20/1993	15	9.5	concrete	0-0.5 ft
											light brown sand, moist	0.5-6 ft
											light brown silty sand, wet	6-13.5 ft
											sandy silt, moist	13.5-17 ft
Cascade Natural Gas	MW-7	NA	211875	S25, T10N, R22E	Monitoring Well	E	1207	7/20/1993	15	10.5	concrete and crushed aggregate	0-0.5 ft
											sand, moist	0.5-6 ft
											silty sand, wet	6-13 ft
											sandy silt, moist	13-15 ft
											sand, wet	15-17
Cascade Natural Gas	MW-5	NA	211876	S25, T10N, R22E	Monitoring Well	E	1207	7/19/1993	19	9.5	concrete	0-0.5 ft
											sand, moist	0.5-6 ft
											silt, moist	6-8 ft
											silty sand, wet	8-13 ft
											sandy silt, wet	13-14.5 ft
											silty sand, wet	14.5-18.5 ft
											sand, moist to wet	18.5-21 ft

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
Cascade Natural Gas	MW-8	NA	211877	S25, T10N, R22E	Monitoring Well	E	1207	7/20/1993	15	9.5	concrete	0-0.5 ft
											sand, moist	0.5-5 ft
											silty sand, wet	5-15 ft
											sand, saturated	15-17 ft
Cascade Natural Gas	MW-4	NA	211878	S25, T10N, R22E	Monitoring Well	E	1207	7/19/1993	15	9	concrete	0-0.5 ft
											sand, moist to wet	0.5-6 ft
											silt, wet	6-9.5 ft
											sand, saturated	9.5-13.5 ft
											silty sand, wet	13.5-15 ft
Mountain Valley Products	NA	NA	116967	SENE, S26, T10N, R22E	Industrial	W	702.97	5/27/1983	205	6	Clay	0-50, 60-105, 116-195 ft
											Gravel	50-60, 105-116, 195-208 ft
UPRR	MW #1	NA	119530	NWSW, S25, T10N, R22E	Test Well	SE	1163.36	4/22/1993	17	NA	gravel/backfill	0-12 ft
											silty sand and gravel - dark brown	12-17 ft
UPRR	MW #2	NA	292114	NWSW, S25, T10N, R22E	Test Well	SE	1163.36	4/22/1993	15	NA	Silty sand, some gravel, dark brown	0-15 ft
UPRR	MW #3	NA	292115	NWSW, S25, T10N, R22E	Test Well	SE	1163.36	4/22/1993	15	NA	silty sand, some gravel, dark brown	0-15 ft

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
UPRR	MW-7	APC097	509318	SENW, S25, T10N, R22E	Resource Protection Well	E	1084.07	11/1/2007	18	8	silty sand	0-18 ft
UPRR	MW-6	APC098	509319	SENW, S25, T10N, R22E	Resource Protection Well	E	1084.07	11/1/2007	18	8	asphalt	0-0.5 ft
											silty sand	0-18 ft
Powel-Christanson-Johnnys Service St.	RW-4	NA	117687	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/14/1989	20	12	asphalt	0-4 inches
											red brick	4 in - 1.5 ft
											sandy clay	1.5-10 ft
											sand	10-20 ft
Powel-Christanson-Johnnys Service St.	RW-1	NA	291795	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/14/1989	20	12	asphalt	0-3 in
											gravel	3-4 in
											sandy soil	4 in - 7.5 ft
											sand	7.5-11 ft
											silty sand	11-20 ft
Powel-Christanson-Johnnys Service St.	MW-5	NA	291796	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/15/1989	20	12	asphalt	0-4 in
											gravel	4in - 1.5 ft
											sandy loam	1.5-16.5 ft
											clay	16.5-20.5 ft
Powel-Christanson-Johnnys Service St.	MW-8	NA	291797	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/21/1989	20	12	asphalt	0-3 in
											red brick	3 in - 1 ft
											cobbles	1-2 ft
											sand, silt	2-12.5ft
											sand, silt, water bearing	12.5-20 ft

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
Powel-Christanson-Johnnys Service St.	RW-2	NA	291798	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	7/15/1989	20	12	asphalt	0-0.25 ft
											sand and gravel	0.25-0.5 ft
											sand	0.5-9 ft
											silty sand, clay	9-15 ft
											silty clay	15-20 ft
											silty sand	20-21.5 ft
Powel-Christanson-Johnnys Service St.	MW-9	NA	291800	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/23/1989	20	12	asphalt	0-0.25 ft
											cobbles (fill dirt)	0.25-1.5 ft
											silty sand	1.5-15 ft
											sandy clay	15-20.5 ft
Powel-Christanson-Johnnys Service St.	MW-6	NA	291801	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/17/1989	20	12	asphalt	0-0.25 ft
											cobbles	0.25-1 ft
											sandy clay	1-6.5 ft
											silty loam	6.5-9.5 ft
											silt with fine sand	9.5-20 ft
Powel-Christanson-Johnnys Service St.	MW-7	NA	291802	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/20/1989	20	12	top soil with cobble	0-3 ft
											silty sand	3-5.5 ft
											sandy clay	5.5-9.5 ft
											sandy clay	9.5-15 ft
											sand w/ red gravel	15-25 ft
											sand	25-37 ft
Powel-Christanson-Johnnys Service St.	RW-3	NA	291803	NWNW, S25, T10N, R22E	Test Well	NE	1132.89	2/16/1989	20	12	asphalt	0-2 in
											silty sand	2 in - 20 ft

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
Bee-Jay Scales	NA	AKA384	394431	NWNW, S25, T10N, R22E	Resource Protection Well	N	605.96	10/21/2004	18	7	sand and gravel	0-5 ft
											silty sand	5-18 ft
Bee-Jay Scales	NA	AKA383	394432	NWNW, S25, T10N, R22E	Resource Protection Well	N	605.86	10/21/2004	18	7	sand and gravel	0-5 ft
											silty sand	5-18 ft
Bee-Jay Scales	NA	AKA382	394433	NWNW, S25, T10N, R22E	Resource Protection Well	N	605.86	10/20/2004	20	7	fill sand and gravel	0-5 ft
											silty sand	5-20 ft
Bee-Jay Scales	NA	APF471	485800	NENE, S26, T10N, R22E	Resource Protection Well	N	605.86	5/25/2007	20	NA	sand	0-20 ft
Bee-Jay Scales	NA	APF472	485802	NENE, S26, T10N, R22E	Resource Protection Well	N	605.86	5/25/2007	12	NA	sand	0-12 ft
Bee-Jay Scales	NA	APF473	485803	NENE, S26, T10N, R22E	Resource Protection Well	N	605.86	5/25/2007	12	NA	sand	0-12 ft
Bee-Jay Scales	NA	APF474	485805	NENE, S26, T10N, R22E	Resource Protection Well	N	605.86	5/25/2007	12	NA	sand	0-12 ft
Bee-Jay Scales	NA	APA986	485807	NENE, S26, T10N, R22E	Resource Protection Well	N	605.86	5/25/2007	12	NA	sand	0-12 ft
Bee-Jay Scales	MW12R	BBB141	1010198	NWNW, S25, T10N, R22E	Resource Protection Well	N	605.86	2/12/2015	17.5	7	sand	0-12 ft
											gravels	12-17.5 ft

Table 2-4. Wells within a Quarter Mile of the Simplot Sunnyside Site

Owner	Well Reference	Ecology Well Tag Number	Ecology Well Log ID	Legal Description	Well Type	Direction from Simplot Site	Distance from Simplot Site (ft)	Installation Date	Total Depth (ft)	Static Groundwater Depth (ft)	Description	
Bee-Jay Scales	MW4R	BBB139	1010228	NWNW, S25, T10N, R22E	Resource Protection Well	N	605.86	2/12/2015	17	11	sand gravel	0-12 ft 12-17 ft
Bee-Jay Scales	MW5R	BBB140	1010265	NWNW, S25, T10N, R22E	Resource Protection Well	N	605.86	2/12/2015	16	7	sand gravel	0-12 ft 12-16 ft
Northwest America Land	MW-15	BHN767	885878	NWNW, S25, T10N, T22E	Resource Protection Well	NE	1135.58	8/21/2013	16	NA	silty sand	0-16 ft
Mary Ann Bleisner	MW19	BHN765	885882	NWNW, S25, T10N, R22E	Resource Protection Well	NE	1132.89	8/20/2013	16	NA	silty sand	0-16 ft
Valley Processing	MW-14	BHN768	885886	NWNW, S25, T10N, R22E	Resource Protection Well	NE	334.35	8/21/2013	16	NA	silty sand	0-16 ft
Valley Processing	MW-16	BHN770	885888	NWNW, S25, T10N, T22E	Resource Protection Well	NE	334.35	8/21/2013	16	NA	silty sand	0-16 ft
Valley Processing	MW-19	BHN769	885889	NWNW, S25, T10N, T22E	Resource Protection Well	NE	334.35	8/21/2013	16	NA	silty sand	0-16 ft
Cascade North Benson LP	NA	BIJ822	877710	SENW, S25, T10N, R22E	Resource Protection Well	E	1207	8/7/2013	20	NA	silty sand	0-20 ft

ft = feet;

Table 2-5. Summary of Select Driller Logs in General Vicinity of Simplot Site

Owner	Well Reference	Legal Description	Distance and Direction from Simplot Site	Static Groundwater Depth (feet)	Description	
Cascade Natural Gas Corp	MW#9	SWNW, S25, T10N, R22E	0.3 miles, E	8 ft	Silty sand, dark brown Saturated below	0-17 ft 7 ft
Cascade Natural Gas Corp	MW#10	SWNW, S25, T10N, R22E	0.3 miles, E	8 ft	Silty sand, dark brown Saturated below	0-15 ft 7 ft
Cascade Natural Gas Corp	MW#11	SWNW, S25, T10N, R22E	0.3 miles, E	8 ft	Silty sand, dark brown Saturated below	0-15 ft 7 ft
City of Sunnyside	Geotech Soil Boring B-12	NENE, S26, T10N, R22E	0.2 miles, NW	6 ft	Silty sand	0-12.5 ft
Powell Christianson	RW-4	NWNW, S25, T10N, R22E	0.2 miles, SE	12 ft	Asphalt Red Brick Sandy Clay Sand	0-4 in 4-18 in 1.5-10 ft 10-20 ft
Powell Christianson	RW-1	NWNW, S25, T10N, R22E	0.25 miles, SE	12 ft	Asphalt Gravel Sandy Soil Sand Silty Sand Silty Sand, Trace Gravel	0-3 in 3-4 in 4-7.5 in 7.5 in-11 ft 11-19 ft 19-20 ft
Powell Christianson	MW-5	NWNW, S25, T10N, R22E	0.25 miles, SE	12 ft	Asphalt Gravel Sandy Soil Brown Sandy Loam Gray Clay	0-4 in 4-18 in 1.5-10 ft 10-16.5 ft 16.5-20.5 ft

Groundwater conditions are further discussed and addressed in Section 3, Site Investigations.

2.2.3 Subsurface Drains

With the construction of the Sunnyside Canal in the late 1800s, irrigated agriculture was brought to the Sunnyside area. Flood irrigation of fields caused the water table to rise, resulting in the flooding of basements and low lying areas, including agricultural fields. In response, under-drains (subsurface drains) were installed throughout the area in the early 1900s. The purpose of these drains was to lower the groundwater table to prevent localized flooding.

Drains in the Simplot site area are further discussed in Section 3.

3 Site Investigations

This section describes investigation activities conducted at the Simplot site since receiving the 2008 Early Notice Letter:

- 2009 GeoProbe Investigations (Section 3.1)
- 2011 Groundwater Monitoring Well Installation and Sampling (Section 3.2)
- 2012 and 2013 Source Removal, Drain Evaluation, and Additional Monitoring Well Construction (Section 3.3)
- 2011 through 2018 Groundwater Monitoring (Section 3.4)

3.1 2009 GeoProbe Investigation

3.1.1 References

- HDR. 2009a. *Preliminary Site Investigation Work Plan*, May 2009.
- HDR. 2009b. *Preliminary Site Investigation Report*, December 2009.

3.1.2 Data Objectives and Needs

The objective of preliminary investigation activities was to determine whether constituents of concern (COC) were present in soils and/or groundwater, and if so, to characterize the nature of the contaminants. Based on the results from Stantec's sampling of off-site groundwater, potential COC included nitrate-N, sulfate, chloride, iron, 1,2-dichloroethane, 1,2-dichloropropane, arsenic, benzene, Dinoseb, and ammonia-N.

3.1.3 Investigation Approach

Table 3-1 summarizes field sampling activities. **Table 3-2** shows laboratory analysis protocol for those samples.

Table 3-1. 2009 GeoProbe Investigation Summary of Sampling Activities

Soil Sampling[1]	
Sampling Method	GeoProbe (soil and groundwater same boring)
Number of borings	13 borings, see **Figure 4**
Number of samples	2 soil samples per boring, 26 samples plus one duplicate
Analysis of samples	See **Table 3-2**
Groundwater Sampling	
Sampling Method	GeoProbe (soil and groundwater same boring)
Number of borings	13 borings, see **Figure 4**
Number of samples	13 plus one duplicate
Analysis of samples	See **Table 3-2**

[1] See report for data validation report summarizing quality assurance/quality control (QA/QC) field sample summary and results.

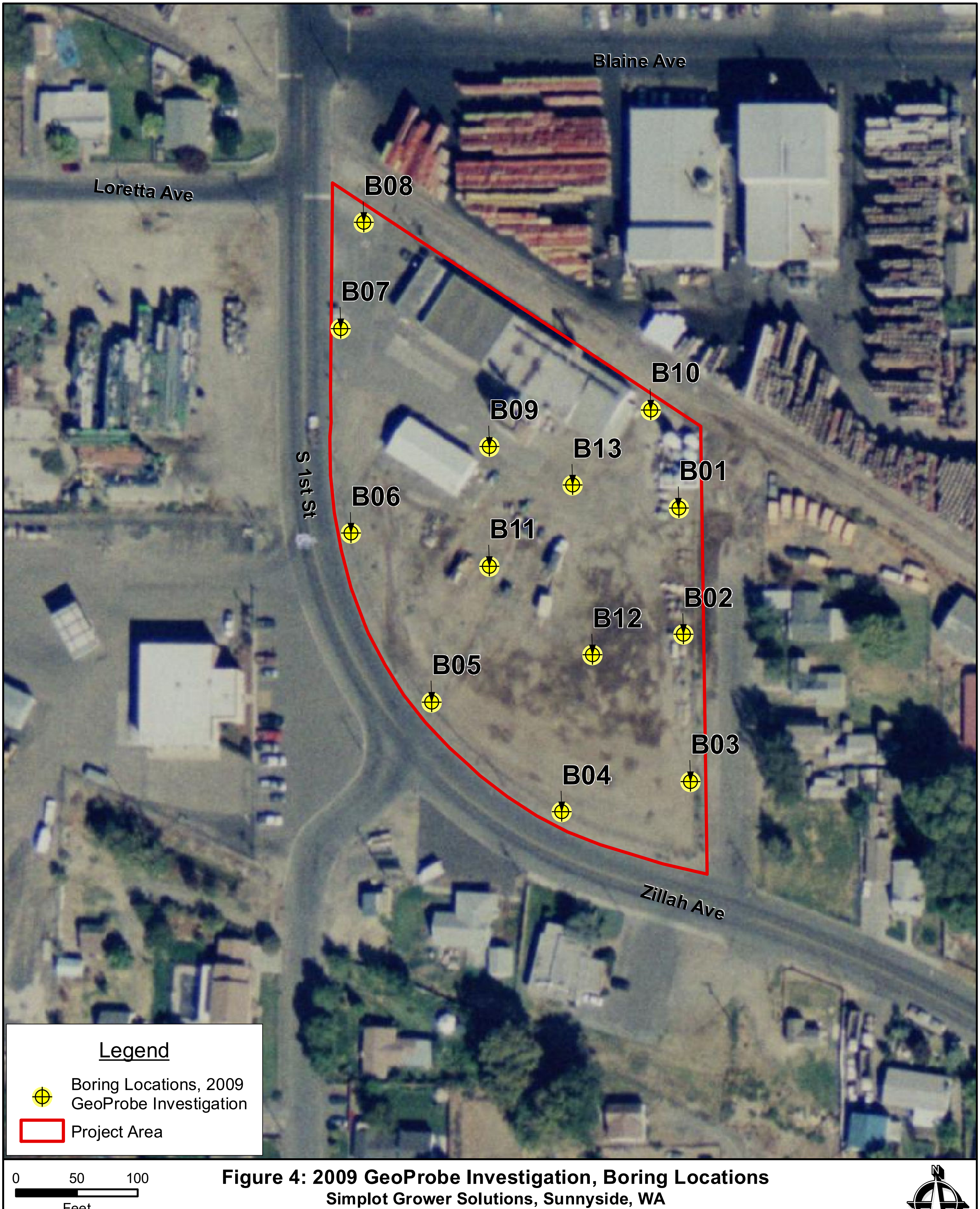


Figure 4: 2009 GeoProbe Investigation, Boring Locations

Simplot Grower Solutions, Sunnyside, WA

Imagery: 2008 1 ft Resolution
Source: Yakima County

Map Date: Wednesday, December 15, 2010
Q:\Simplot\Sunnyside\map_docs\WellLookup.mxd

HDR

Table 3-2. 2009 GeoProbe Investigation Laboratory Analysis

Analytical Parameter	Method	COC Included	Media/Laboratory
Volatile Organic Compounds (VOCs) (full list)	EPA 8260B	1,2-dichloroethane 1,2-dichloropropane	Water and Soil/ESC
Chlorinated Herbicides (full list)	EPA 8151	Dinoseb	Water and Soil/ESC
RCRA Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver)	EPA 6010B	Arsenic	Water and Soil/ESC
Inorganic Ions (Cl, SO_4)	EPA 9056	Chloride Sulfate	Water/ESC
Nitrate-N	EPA 353.2	Nitrate-Nitrogen	Water/ESC
Nitrate-N	1N KCl Extraction	Nitrate-Nitrogen	Soil/Kuo
Ammonia-N	EPA 350.1	Ammonium-Nitrogen	Water/ESC
Ammonium-N	1N KCl Extraction	Ammonium-Nitrogen	Soil/Kuo

RCRA = Resource Conservation and Recovery Act

3.1.4 Investigation Results

The laboratory data was validated and met the requirements outline in the *Quality Assurance Project Plan* (QAPP) (HDR 2009c). The *Preliminary Site Investigation Report* (HDR 2009b) compared soil and groundwater results to Models Toxic Control Act (MTCA) cleanup levels. For this data summary report, the data is presented for sampling activities and compared to MTCA levels in Section 4.

3.1.4.1 Soil Sample Results

HDR's field team collected two soil samples at each boring location – one near the ground surface, and another near the groundwater interface – totaling 26 soil samples in all (plus one field duplicate). Soil sample results are summarized for volatile organic compounds (VOCs) (**Table 3-3**), metals (**Table 3-4**), herbicides (**Table 3-5**), and ammonia and nitrate (**Table 3-6**). Laboratory reports are presented in Appendix C (included as a CD).

Most soil samples were below detection limit (BDL) for VOCs. Compounds detected in one or more soil sample included benzene, 1,2-dichloropropane, naphthalene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, 1,3,5-trimethylbenzene, and total xylenes.

Soil samples collected from each boring contained detectable levels of at least four of the eight metals analyzed. **Table 3-4** summarizes metals results for soil samples.

Soil samples were BDL for herbicides in all borings except B13. In boring B13, the soil sample collected near the groundwater interface contained detectable levels of 2,4-D and Dicamba.

Nitrate-nitrogen and ammonia-nitrogen were detected at varying levels in each soil sample collected from each boring (**Table 3-6**). **Figure 5** illustrates a post plot of nitrate-nitrogen and ammonia-nitrogen concentrations at each boring.

Table 3-3. Soil Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
Volatile Organic Compounds - EPA Method 8260B (mg/kg)													
Acetone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0095
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0084	BDL	BDL	BDL	0.25
Bromo-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromo-methane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tert-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloro-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-3. Soil Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Chloroethyl vinyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloro-methane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Chloro-toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4-Chloro-toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-3-Chloro-propane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-ethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibromo-methane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloro-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichloro-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichloro-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-3. Soil Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Di-chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Di-hloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.032
1,1-Di-chloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-di-chloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-di-chloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-dichloro-propane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.26	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.039	BDL
1,1-dichloro-propene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-dichloro-propane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,3-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,2-dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Di-isopropyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-3. Soil Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
Ethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Hexachloro-1,3-butadiene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropyl-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
p-Isopropyl-toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Methyl-2-pentanone (MIBK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl tert-butyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.045
N-Propyl-benzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1,2-Tetra-chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetra-chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-3. Soil Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
1,1,2-Tri-chloro-1,2,2-trifluoro	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloro-ethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Tri-chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Tri-chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloro-ethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorofluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.065
1,2,3-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.017
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.052
1,3,5-Trimethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.014
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.040

Table 3-3. Soil Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
Vinyl chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylenes, Total	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.033
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.18

BDL = below detection limit. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-4. Soil Sample Results - Metals

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
RCRA 8 Metals - EPA Method 6010B (mg/kg)													
Mercury	0.072	BDL	0.036	BDL	BDL	BDL	BDL	BDL	BDL	0.036	BDL	0.055	0.024
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Arsenic	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3.2	5.6	1.9	3.2	3.5	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	7.0	5.8	6.9	7.9	6.2	BDL	BDL
Barium	110	180	210	180	190	190	140	180	180	140	170	170	160
	180	200	210	250	300	240	210	160	210	190	210	220	210
Cadmium	7.1	3.6	3.1	1.2	1.2	1.3	1.2	1.7	1.6	3.0	2.2	1.7	1.2
	5.2	3.3	1.4	1.6	1.4	1.6	1.4	1.1	1.6	1.8	1.3	0.44	0.40
Chromium	37	25	24	21	24	24	18	22	25	54	22	22	27
	29	27	26	29	26	28	25	21	27	27	26	32	33
Lead	77	47	44	16	12	12	19	110	4.3	40	17	38	40
	27	27	12	14	12	13	4.9	3.8	3.5	2.4	4.7	14	15
Selenium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Silver	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.84	0.98	BDL	0.66	0.65	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	0.98	0.81	1.1	1.0	BDL	BDL	BDL

BDL = below detection limit; mg/Kg = milligrams per kilogram. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-5. Soil Sample Results - Herbicides

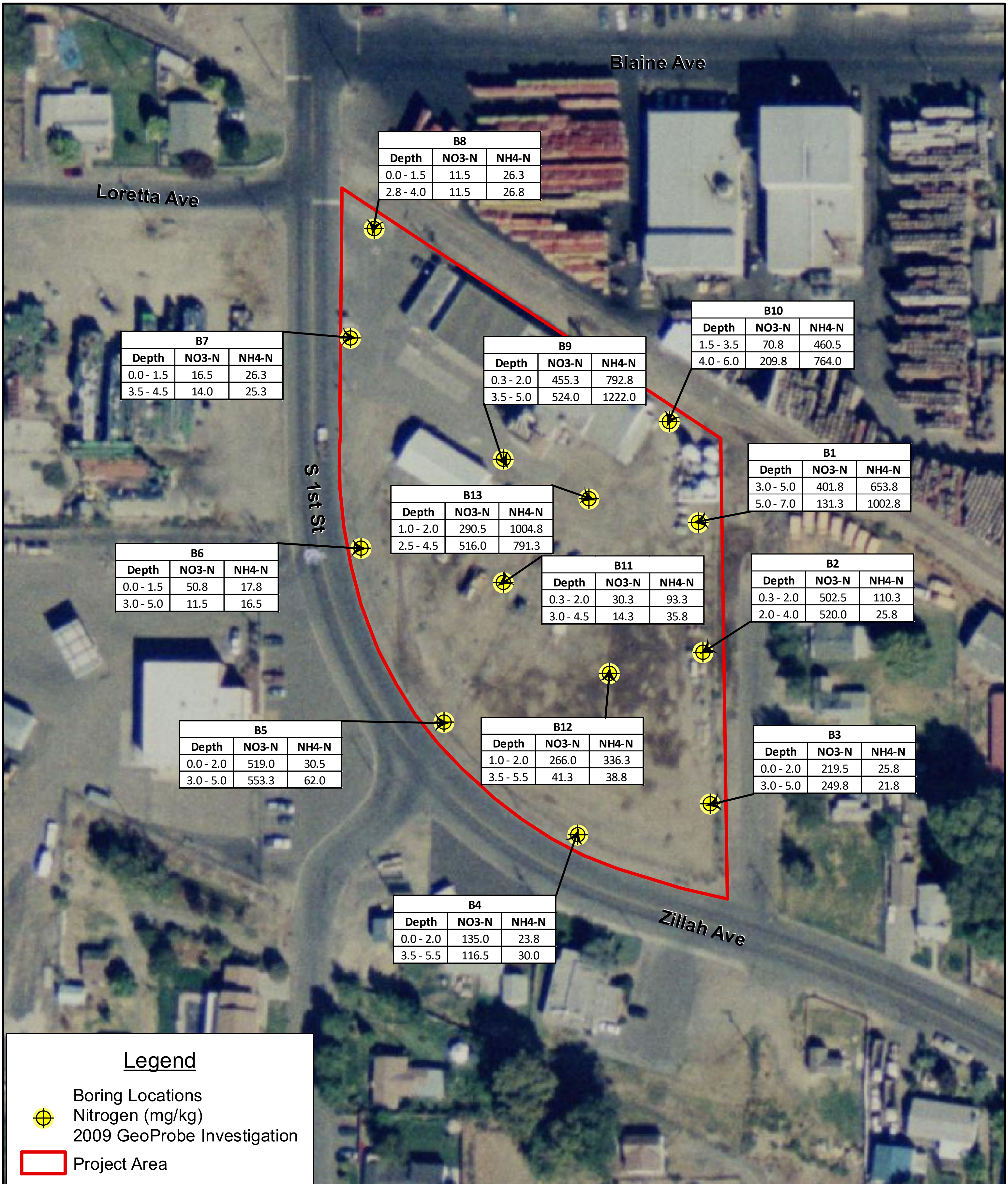
	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
Herbicides - EPA Method 8151 (mg/kg)													
2,4-D	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.20
Dalapon	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,4-DB	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dicamba	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.13
Dichloroprop	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dinoseb	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MCPA	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MCPP	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,4,5-T	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,4,5-TP (Silvex)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

BDL = below detection limit; mg/Kg = milligrams per kilogram. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-6. Soil Sample Results - Nitrogen

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5
Nitrate-Nitrogen and Ammonia-Nitrogen - 1N KCl Method (mg/kg)													
Nitrate-Nitrogen	402	503	220	135	519	50.8	16.5	11.5	455	70.8	30.3	266	291
	131	520	250	117	553	11.5	14.0	11.5	524	210	14.3	41.3	516.0
Ammonia-Nitrogen	654	110	25.8	23.8	30.5	17.8	26.3	26.3	793	461	93.3	336	1,005
	1003	25.8	21.8	30.0	62.0	16.5	25.3	26.8	1,222	764	35.8	38.8	791

mg/Kg = milligrams per kilogram. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.



0 50 100
Feet

Figure 5: 2009 GeoProbe Investigation, Soil Nitrogen Results

Simplot Grower Solutions, Sunnyside, WA

Imagery: 2008 1 ft Resolution
Source: Yakima County

Map Date: Wednesday, December 15, 2010
Q:\Simplot\Sunnyside\map_docs\WellLookup.mxd

HDR

3.1.4.2 Groundwater Sample Results

HDR's field team collected one groundwater sample at each boring location, collecting 13 groundwater samples in total (plus quality control samples). Water samples were analyzed for VOCs (**Table 3-7**), metals (**Table 3-8**), herbicides (**Table 3-9**), and inorganics (**Table 3-10**). Boring B10 did not produce sufficient groundwater sample for analysis of metals, herbicides, or inorganics; only VOCs were analyzed for the groundwater sample from B10. Laboratory reports are presented in Appendix C (CD).

VOC compounds were not detected in groundwater samples collected from B2, B4, B5, B6, B7, and B8. Borings B1, B3, B9, B10, B11, B12, and B13, had detections of multiple VOCs (**Table 3-7**).

For metals, cadmium, selenium, and silver were not detected in any groundwater samples. Arsenic was detected in five borings, while barium, chromium, and lead were detected in all samples.

The only herbicide analyte detected in the groundwater samples was 2,4-D, which was detected in B9 and B13.

Nitrate-nitrite was detected in all groundwater samples. Ammonia-nitrogen was detected in all borings except B3 or B4. Chloride and sulfate were detected at varying levels in each of the groundwater samples. **Figure 6** illustrates a post plot for nitrogen levels in groundwater samples.

Table 3-7. Groundwater Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
Volatile Organic Compounds - EPA Method 8260B (mg/L)													
Acetone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acrolein	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	0.75	BDL	BDL	BDL	BDL	BDL	BDL	BDL	8.3	0.49	BDL	BDL	6.9
Bromobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloro-methane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0015	BDL
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0014	0.020	0.0010	BDL
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.011	BDL	BDL
tert-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	0.013	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorodibromo-methane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Chloroethyl vinyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromoethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0014	BDL	BDL	BDL

Table 3-7. Groundwater Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
Volatile Organic Compounds - EPA Method 8260B (mg/L)													
Dibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	0.090	BDL	0.020	BDL	BDL	BDL	BDL	BDL	BDL	0.0074	BDL	BDL	0.49
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,2-dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-dichloropropane	0.037	BDL	0.014	BDL	BDL	BDL	BDL	BDL	BDL	0.0044	BDL	0.22	BDL
1,1-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,3-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,2-dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-7. Groundwater Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
Volatile Organic Compounds - EPA Method 8260B (mg/L)													
Di-isopropyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	0.029	BDL	BDL	BDL	BDL	BDL	BDL	BDL	1.8	0.0013	0.0062	0.0018	0.55
Hexachloro-1,3-butadiene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropylbenzene	0.018	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0046	0.022	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.0020	0.0052	BDL	BDL
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Methyl-2-pentanone (MIBK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl tert-butyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	0.20	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.052	BDL	0.013	BDL
n-Propylbenzene	0.051	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.30	0.0088	0.057	0.0030	BDL
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloro-1,2,2-trifluoro	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	0.064	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-7. Groundwater Sample Results - VOCs

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
Volatile Organic Compounds - EPA Method 8260B (mg/L)													
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorofluoro-methane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	0.55	BDL	BDL	BDL	BDL	BDL	BDL	BDL	2.1	0.21	0.65	0.041	2.6
1,2,3-Trimethylbenzene	0.16	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.57	0.034	0.0022	0.0094	0.59
1,3,5-Trimethylbenzene	0.15	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.50	0.030	0.20	0.010	0.62
Vinyl chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylenes, Total	2.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	3.7	0.46	0.095	0.012	3.1

BDL = below detection limit; mg/L = milligrams per liter. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-8. Groundwater Sample Results - Metals

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10*	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
RCRA 8 Metals - EPA Method 6010B (mg/L)													
Mercury	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	0.00024	BDL
Arsenic	0.036	0.040	0.038	BDL	BDL	BDL	BDL	0.063	BDL	N/A	BDL	BDL	0.023
Barium	1.3	1.1	0.79	0.87	0.58	1.4	0.61	0.34	2.3	N/A	1.9	1.6	0.6
Cadmium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
Chromium	0.052	0.036	0.038	0.042	0.036	0.035	0.037	0.013	0.064	N/A	0.030	0.023	0.033
Lead	0.053	0.10	0.038	0.043	0.054	0.056	0.038	0.027	0.048	N/A	0.041	0.028	0.054
Selenium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
Silver	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL

* Not enough B10 GW sample available to run metals analysis

BDL = below detection limit; mg/L = milligrams per liter. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-9. Groundwater Sample Results - Herbicides

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10*	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
Herbicides - EPA Method 8151 (mg/L)													
2,4-D	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.071	N/A	BDL	BDL	0.49
Dalapon	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
2,4-DB	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
Dicamba	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
Dichloroprop	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
Dinoseb	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
MCPA	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
MCPP	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
2,4,5-T	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL
2,4,5-TP (Silvex)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	N/A	BDL	BDL	BDL

* Not enough B10 GW sample available to run herbicides analysis

BDL = below detection limit; mg/L = milligrams per liter. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-10. Groundwater Sample Results - Inorganics

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10*	B11	B12	B13
Depth (ft)	9.9 - 12.0	8.2 - 11.2	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	9.0 - 12.0	7.0 - 10.0	8.0 - 12.0	10.0 - 13.0	9.0 - 12.0	9.0 - 12.0	8.5 - 11.5	9.0 - 12.0
Nitrate-Nitrite - EPA Method 353.2 (mg/L)													
Nitrate-Nitrite	1100	42	12	6.9	400	9.4	4.2	41	1.1	N/A	37	6.9	29
Ammonia Nitrogen - EPA Method 350.1 (mg/L)													
Ammonia-Nitrogen	1300	13	BDL	BDL	46	0.13	0.62	140	3.8	N/A	0.34	0.11	0.9
Chloride and Sulfate - EPA Method 9056 (mg/L)													
Chloride	380	150	380	190	480	68	90	65	140	N/A	180	160	500
Sulfate	3600	350	270	700	1600	280	760	480	140	N/A	420	210	400

* Not enough B10 GW sample available to run inorganics analysis
BDL = below detection limit; mg/L = milligrams per liter. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

0 50 100

Feet

Figure 6: 2009 GeoProbe Investigation, Groundwater Nitrogen Results

Simplot Grower Solutions, Sunnyside, WA

N

Imagery: 2008 1 ft Resolution
Source: Yakima County

Map Date: Wednesday, December 15, 2010
Q:\Simplot\Sunnyside\map_docs\WellLookup.mxd

HDR

3.2 2011 Groundwater Monitoring Well Installation and Sampling

3.2.1 References

- HDR. 2010. *Monitoring Well Construction and Sampling Work Plan, July 2010 (revised December 2010).*
- HDR. 2010. *Standard Operating Procedure for Groundwater Sampling* (included in Appendix A of the above listed work plan.
- HDR. 2011. *Monitoring Well Construction and Sampling Report*, April 2011.

3.2.2 Data Objectives and Needs

The objective was to construct five on-site groundwater monitoring wells and to sample these wells on a quarterly basis to further assess the nature and extent of contaminants. Groundwater samples were analyzed for COCs using appropriate U.S. Environmental Protection Agency (EPA) or state methodology by a qualified laboratory. Groundwater monitoring wells provide information on groundwater flow direction, seasonal variations on direction and gradient, and an indication of groundwater quality both up and downgradient of the facility.

3.2.3 Investigation Approach and Results

Simplot developed and submitted a *Monitoring Well Construction and Sampling Work Plan* to Ecology in July 2010 (HDR 2010), and following Ecology review and comments, updated the plan in December 2010. Ecology approved the work plan in December 2010.

Site investigation activities included installing five groundwater monitoring wells, well development, well surveying, and the first round of quarterly groundwater sampling. Wells were installed and soil samples collected on March 15 and 16, 2011. Groundwater sampling was conducted on March 17, 2011.

3.2.3.1 Groundwater Monitoring Well Construction

Based on the Bee-Jay Scales site investigation, groundwater flow was anticipated to be toward the east to southeast. One objective of installing the monitoring wells was to assess groundwater flow direction and seasonal changes over four quarters. Because of the uncertainty in groundwater flow direction (at that time), five monitoring wells were proposed. Monitoring well locations are presented in **Figure 7** (note that this is the monitoring well network in 2011 with modification in 2012).

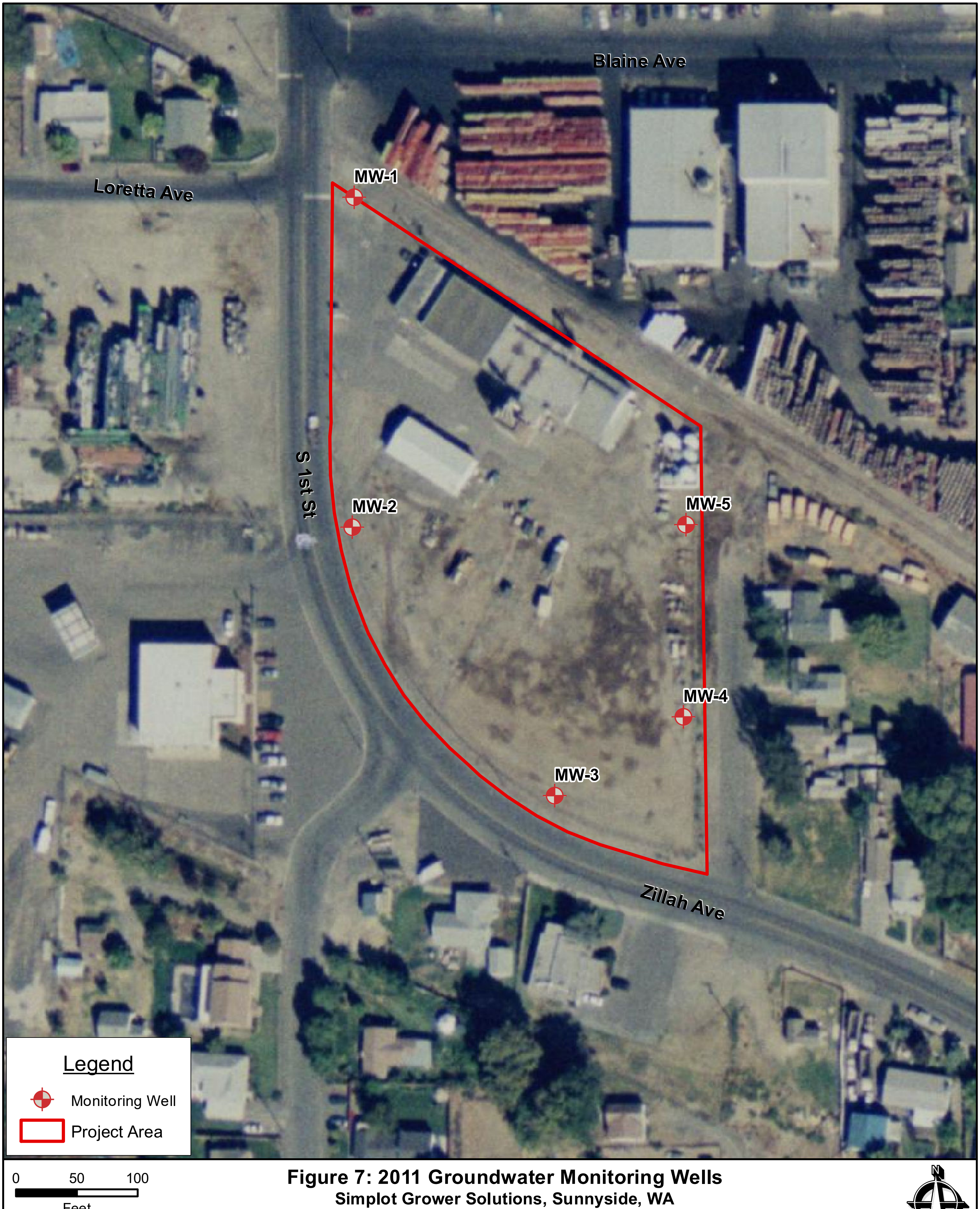


Figure 7: 2011 Groundwater Monitoring Wells
Simplot Grower Solutions, Sunnyside, WA

Imagery: 2008 1 ft Resolution
Source: Yakima County

Map Date: Wednesday, December 15, 2010
Q:\Simplot\Sunnyside\map_docs\WellLookup.mxd

Well logs are presented in Appendix B. General drilling activities involved the following (HDR 2011):

- The well boreholes were drilled using hollow stem augers in March 2011. The drilling crew was supervised by a professional geologist who was responsible for lithologic logging and documentation of construction activities of the monitoring wells. A Washington professional geologist supervised on-site personnel, well construction design, and reporting. Soil boring grab samples were collected every 5 feet from the cuttings as the boreholes were advanced, or at discernible changes in lithology; whichever was less.
- The hollow stem augers had an 8-inch outside-diameter and were drilled down to the total depth of each well boring. Water levels measured from the completed wells on March 17, 2011, ranged from 6.73 to 8.46 feet below ground surface (bgs). The wells were drilled to a depth of approximately 15 to 20 feet bgs, or approximately 9 to 12 feet beyond the depth to static water. Well construction details are summarized in **Table 3-11**.
- The monitoring wells were completed using 2-inch-diameter, flush-threaded, Schedule 40 PVC casing and well screen. Ten or 15 feet of factory-slotted well screen (0.010-inch slot size) were installed in each well. End caps were threaded to the base of the well screens. CSSI silica sand (Grade 10-20) was used as a filter pack surrounding the well screens and set up to approximately 2 feet above the top of the well screens.
- The wellheads of each well were secured using a lockable, 5-foot-long, 6-inch by 6-inch, protective steel monument, which was placed over the well and centered in a concrete pad. The top 2 to 3 feet of the annular space surrounding the well were also filled with concrete. Steel guard posts were sunk into the ground around the well monument and filled with concrete to serve as a protective barrier against collision damage for each well.
- Following well installation, each well was surged and pumped to set the filter pack and remove fine sediment from the well. Each well was developed using a sequence of surging and pumping with a pump. Surging the well forces groundwater to flow in and out of the well, breaking any particle bridges and setting the sand filter pack up against the well screen. The well was then pumped to remove any fine sand that was pulled through the screen during surging. Development was considered complete when the well was relatively free of sediment; at a minimum, 10 well casing volumes were removed.
- The monitoring wells were surveyed to the top of the PVC well casing and to the ground surface at the base of the protective well casing. These measurements will be used to determine the groundwater elevations and flow direction. Permit Surveying, Inc., a Washington-licensed surveyor, surveyed well locations and top of casing elevations.

Table 3-11. Well Construction Details

Monitoring Well	Top PVC Elevation (ft amsl)	Depth of Well (ft bgs)	Screen Depth (ft bgs)
MW-1	745.76	18.0	7.5-17.5
MW-2	745.34	15.5	5.0-15.0
MW-3	745.58	20.5	5.0-20.0
MW-4	744.95	20.5	5.0-20.0
MW-5	745.15	20.5	5.0-20.0

ft amsl = feet above mean sea level; ft bgs = feet below ground surface

3.2.3.2 Soil Sampling from Well Borings

HDR's field team collected one soil sample from each well boring. The sample depth was determined in the field, and was generally immediately above the soil/groundwater interface. Soils were tested for the work plan approved parameters listed in **Table 3-12**. Analytical results are presented in **Table 3-13**.

Table 3-12. Analyses for Soil Boring Samples

Analytical Parameter	Method	Preservative	Holding Times
Volatile Organic Compounds (VOCs)	EPA 8260B	10 mL MeOH	21 days
Polynuclear Aromatic Hydrocarbons (low level)	EPA 8270sim	4°C	7 days
Total Petroleum Hydrocarbon (TPH)	NWTPHGX NWTPHDX	4°C	7 days
Nitrate-N	2M KCl Extraction	4°C	Not specified
Ammonia-N	1N KCl Extraction	4°C	Not specified

Table 3-13. Soil Boring Sample Results for Detected Compounds

Date	Field Sample ID	Laboratory ID	Detected Compound	Result	Units
MW-1[1]					
3/15/2011	MW-1-8.5	L507163-01	Ammonia-Nitrogen	50	mg/Kg
3/15/2011	MW-1-8.5	L507163-01	Nitrate	33	mg/Kg
MW-2					
3/15/2011	MW-2-6.5	L507163-02	Nitrate	18	mg/Kg
MW-3					
3/15/2011	MW-3-7	L507163-03	Nitrate	8.1	mg/Kg
MW-4					
3/15/2011	MW-4-7	L507163-04	Nitrate	120	mg/Kg
MW-5					
3/16/2011	MW-5-7	L507163-05	Nitrate	550	mg/Kg
3/16/2011	MW-5-7	L507163-05	Ammonia-Nitrogen	2,000	mg/Kg
3/16/2011	MW-5-7	L507163-05	2-Chlorotoluene	0.010	mg/Kg
3/16/2011	MW-5-7	L507163-05	Diesel Range Organics	11	mg/Kg
3/16/2011	MW-5-7	L507163-05	Residual Range Organics[2]	19	mg/Kg

[1] See **Figure 7** for sample locations. Only detected constituents are reported in this table.

[2] As reported under Method MWTPHDX. mg/Kg = milligrams per kilogram. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

3.2.3.3 Groundwater Survey and Elevation

HDR's field team collected first quarterly samples on March 17, 2011. Depth to groundwater was measured at each monitoring well and is presented in **Table 3-14**. Groundwater elevations from the March 2011 sampling event are presented in **Figure 8**. Groundwater flow direction is southeast, which is consistent with the Bee-Jay Scales site investigation results. The average gradient was approximately 0.006 feet per feet.

Table 3-14. Groundwater Elevation Measurements, March 17, 2011

Well	Measured Depth to Water (feet)	Reference Elevation[1] (feet)	Groundwater Elevation (feet)
MW-1	8.93	745.76	736.83
MW-2	9.31	745.34	736.03
MW-3	10.93	745.58	734.65
MW-4	10.89	744.95	734.06
MW-5	10.54	745.15	734.61

[1] Top of casing elevation surveyed by Permit Surveying, Inc.

Based on the observed southeasterly groundwater flow in March 2011, the wells constructed on site are deemed up, down, or crossgradient as follows:

- MW-1 – upgradient well
- MW-2 – upgradient well
- MW-3 –side or downgradient well
- MW-4 - downgradient well
- MW-5 – downgradient well

0 80 160
Feet

Figure 8: March 2011 Groundwater Isopleth Map
Simplot Grower Solutions, Sunnyside, WA

Imagery: June 2011 Yakima 0.5 ft, ESRI World Imagery Map Service
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Map Date: Wednesday, August 7, 2019
Q:\Simplot\Sunnyside\map_docs\SiteMap2019.mxd

3.2.3.4 Monitoring Well Sampling

The goal of the 2010 work plan was to sample groundwater quarterly for one year. The first sampling occurred after well development (March 17, 2010), and the remaining three events occurred at 3-month intervals. Field sampling activities conducted for the first quarterly event following well development followed the *Standard Operating Procedure for Groundwater Sampling* that was included in Appendix A of the Work Plan (HDR 2010).

HDR's field team collected groundwater samples following static water measurements. Wells were purged with a disposable bailer. Field pH, conductivity, and temperature measurements were recorded during purging. Samples were taken once field parameters were stable (three consecutive measurements within 10 percent) or when at least three well bore volumes had been purged. Samples were analyzed for the work plan approved parameters listed in **Table 3-15**.

Table 3-15. Analyses Conducted on Groundwater Samples

Analytical Parameter	Method	Preservative	Holding Times
Volatile Organic Compounds (VOCs)	EPA 8260B	4°C, pH < 2 with HCl	14 days
Polynuclear Aromatic Hydrocarbons (PAHs)	EPA 8270sim	4°C	7 days
Chlorinated Herbicides (full list)	EPA 8151A	4°C	7 days
Total Petroleum Hydrocarbon (TPH)	NWTPHGX NWTPHDX	4°C, pH < 2 with HCl	7 days
RCRA Metals[1] (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver)	EPA 6010B	4°C, pH < 2 with HNO_3	6 months 28 days Hg
Nitrate+Nitrite-N	EPA 353.2 or EPA 300.0	4°C	28 days
Ammonia-N	SM20 4500 NH3 D or 350.1	4°C, pH < 2 H_2SO_4	28 days

[1] Resource Conservation and Recovery Act (RCRA) metals filtered in the field.

Groundwater samples were also collected in June, September, and December 2011. Analytical results are summarized in **Table 3-25** in Section 3.4.4.

3.3 2012 and 2013 Source Removal, Drain Evaluation and Additional Monitoring Well Construction

3.3.1 References

- HDR. 2012a. *Source Removal, Drain Evaluation, Monitoring Well Construction Work Plan.* July 2012
- HDR. 2013a. *Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Report*. February 2013.
- HDR. 2013b. *Supplemental Drain Evaluation and Monitoring Well Sampling Report*. September 2013.

3.3.2 Data Objectives and Needs

This objectives of the 2012 activities were as follows:

- Source removal – remove soils associated with the rinse area on the Growers Solutions site. Soil in this area was elevated in nitrate and ammonium concentrations and represents a major source for groundwater impacts. Removing this source area should reduce leaching of nitrates to groundwater. Additional on-site source removal or other mitigation may be necessary and will be further evaluated following assessment of off-site conditions.

- Off-site drain investigation – measure in-pipe flow rates to determine if groundwater is infiltrating the piping and collect water quality samples associated with the drainage system.
- Further groundwater characterization – install two off-site monitoring wells to assess groundwater conditions downgradient of the Grower Solutions site. Locate off-site wells l based on the findings of the off-site drain investigation and groundwater flow direction. In addition, replace well MW-5 with MW-5R (which was removed during source removal of the rinse area).

3.3.3 Investigation Approach and Results

3.3.3.1 Rinsate Area Excavation – Source Removal

Soils beneath the rinsate area had high concentrations of nitrate and ammonium based on previous investigations (HDR 2009b and 2011). Furthermore, nitrate and ammonium concentrations in groundwater collected from the adjacent MW-5 have been elevated. Given the historic practices associated with the rinsate area, and based on soil and groundwater sampling results, the remedial objective was to remove soils beneath the rinsate area down to groundwater. Per the Ecology-approved work plan, this action was focused on the rinsate area only.

In December 2012, approximately 155 cubic yards of soils were excavated (20 X 22 feet by 9.5 feet deep) (**Figure 9**). The dimension of the rinsate area excavation was based on visual observation, review of historic aerial photographs, and information provided by Simplot personnel familiar with site operations. Depth to groundwater at the time of the excavation was about 9.5 feet bgs. Excavated soil was stockpiled on Visqueen along the central-eastern portion of the site, outside of actively used areas. Following excavation, the soil stockpile was covered with Visqueen. Soils were later removed from site and used for land application (permitted through Benton-Franklin Health District).

HDR's field team collected discrete soil samples from the excavation pit sides and bottom (**Figure 9**). Two soil samples were collected from each side of the pit at 3 to 4 feet bgs and 8 to 9 feet bgs, and two samples were collected from the pit bottom, approximately 9.5 feet bgs. Overall, 10 soil samples were collected and sent to the laboratory for analysis. **Table 3-16** lists the analyses performed on each soil sample. Laboratory results for soil are in Appendix C.

Table 3-16.Analyses for Excavation Soil Samples

Analytical Parameter	Method	Preservative
Volatile Organic Compounds (VOCs) (full list)	EPA 8260B	Terra Core – Methanol
Chlorinated Herbicides (full list)	EPA 8151A	4°C
Nitrate-N	2M KCl Extraction	4°C
Ammonium-N	1N KCl Extraction	4°C

°C = degrees Celsius

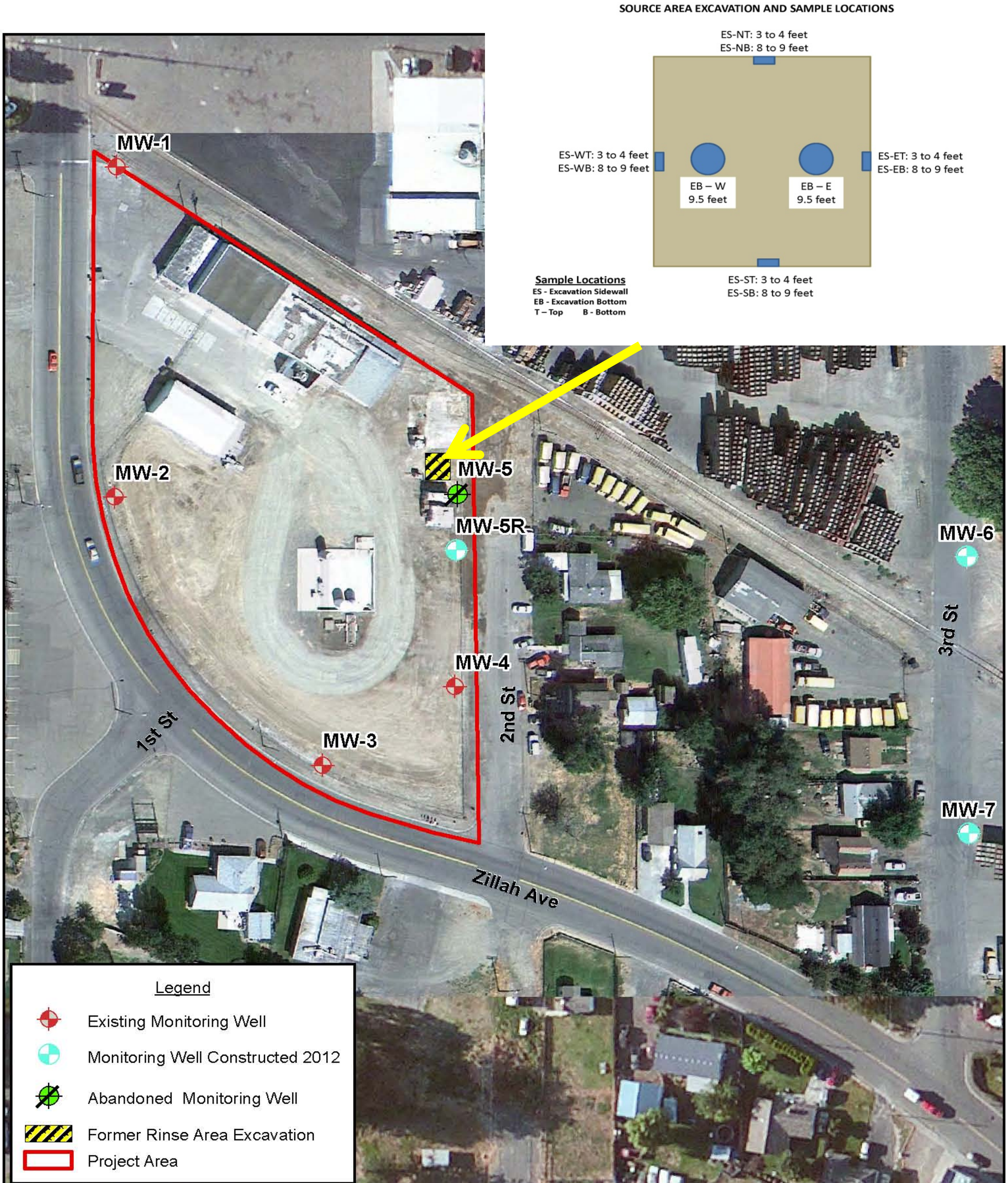
The following tables provide analysis results for soil samples collected from the pit after excavation (samples represent soil quality remaining in the pit bottom and walls). **Table 3-17** summarizes results for nitrate-nitrogen and ammonium-nitrogen. Nitrate-N ranged from 180 milligrams per kilogram *mg/Kg) to 620 mg/Kg. Ammonium-N ranges from 8.7 to 2,200 mg/Kg.

Table 3-17. Excavation Pit Soil Sample Results - Nitrate-Nitrogen and Ammonium-Nitrogen

Excavation Sample Location	ES-EB	ES-ET	EB-E	ES-NB	ES-NT	EB-W	ES-SB	ES-ST	ES-WB	ES-WT
Parameter Depth (ft)	**8 to 9**	**3 to 4**	**9 to 9.5**	**3 to 4**	**3 to 4**	**9 to 9.5**	**8 to 9**	**3 to 4**	**8 to 9**	**3 to 4**
Nitrate-Nitrogen and Ammonium-Nitrogen - 1N KCl Method (mg/kg)										
Nitrate-Nitrogen	240	240	340	280	280	180	540	620	250	370
Ammonium-Nitrogen	870	870	1600	1200	280	1900	1800	66	2200	8.7

mg/Kg = milligrams per kilogram; ft = feet. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-18 summarizes soil VOCs results based on EPA Method 8260. Most soil samples had VOC compounds BDL. Detected compounds included benzene, chlorobenzene, chlorodibromo-methane, 2-chlorotoluene, 1,2-dichloroethane, 1,2-dichloropropane, Isopropylbenzene, N-propyl-benzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, 1,3,5-trimethylbenzene, and total xylenes.



0 100 200
Feet

Figure 9 Monitoring Well and Soil Excavation Locations

Simplot Grower Solutions, Sunnyside, WA

Imagery: Google Earth; Bing Online Imagery Service
Source: (c) Google Earth; (c) 2010 Microsoft Corporation and its data suppliers

Map Date: Friday, February 22, 2013
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

HDR ONE COMPANY *Many Solutions*™

Table 3-18. Excavation Pit Soil Sample Results - VOCs

Excavation Sample Location	ES-EB	ES-ET	EB-E	ES-NB	ES-NT	EB-W	ES-SB	ES-ST	ES-WB	ES-WT
Parameter Depth (ft)	**8 to 9**	**3 to 4**	**9 to 9.5**	**8 to 9**	**3 to 4**	**9 to 9.5**	**8 to 9**	**3 to 4**	**8 to 9**	**3 to 4**
Volatile Organic Compounds - EPA Method 8260B (mg/kg)										
Acetone	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Acrylonitrile	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Benzene	BDL	BDL	0.002	BDL	BDL	0.06	0.019	BDL	0.01	BDL
Bromobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromodichloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromoform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Bromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
n-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
sec-Butylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
tertButylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Carbon tetrachloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chlorobenzene	BDL	BDL	BDL	BDL	BDL	0.002	0.002	BDL	0.002	BDL
Chlorodibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	0.004	BDL	BDL	BDL
Chloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Chloroethyl vinyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloroform	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Chloromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Chlorotoluene	BDL	BDL	0.005	BDL	BDL	0.01	BDL	BDL	0.004	BDL
4-Chlorotoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromo-3-Chloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dibromomethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichlorodifluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dibromoethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-Dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-Dichloroethane	BDL	BDL	BDL	BDL	BDL	0.01	BDL	BDL	BDL	BDL
cis-1,2-di-chloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,2-dichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-dichloropropane	BDL	BDL	BDL	BDL	BDL	0.003	BDL	BDL	BDL	0.003
1,1-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,3-dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
cis-1,3-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
trans-1,3-dichloropropene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,2-dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Di-isopropyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Ethylbenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Table 3-18. Excavation Pit Soil Sample Results - VOCs

Excavation Sample Location	ES-EB	ES-ET	EB-E	ES-NB	ES-NT	EB-W	ES-SB	ES-ST	ES-WB	ES-WT
Parameter Depth (ft)	**8 to 9**	**3 to 4**	**9 to 9.5**	**8 to 9**	**3 to 4**	**9 to 9.5**	**8 to 9**	**3 to 4**	**8 to 9**	**3 to 4**
Hexachloro-1,3-butadiene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Isopropylbenzene	BDL	BDL	BDL	BDL	BDL	0.002	BDL	BDL	BDL	BDL
p-Isopropyltoluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2-Butanone (MEK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methylene Chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
4-Methyl-2-pentanone (MIBK)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Methyl tertbutyl ether	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Naphthalene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
N-Propyl-benzene	BDL	BDL	0.002	BDL	BDL	0.005	BDL	BDL	BDL	BDL
Styrene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2,2-Tetrachloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichlorotrifluoroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Tetrachloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,1-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1,2-Trichloroethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichloroethene	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Trichlorofluoromethane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,3-Trichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2,4-Trimethylbenzene	BDL	BDL	0.008	BDL	BDL	0.034	BDL	BDL	0.002	BDL
1,2,3-Trimethylbenzene	BDL	BDL	0.003	BDL	BDL	0.011	BDL	BDL	BDL	BDL
1,3,5-Trimethylbenzene	BDL	BDL	0.005	BDL	BDL	0.014	BDL	BDL	BDL	BDL
Vinyl chloride	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Xylenes, Total	BDL	BDL	0.017	BDL	BDL	0.15	0.018	BDL	0.012	BDL

BDL = below detection limit; mg/Kg = milligrams per kilogram; ft = feet. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.

Table 3-19 shows the results for pesticides. Soil samples were BDL for herbicides in all samples.

In addition to collecting discrete soil samples from the excavated pit, HDR's field team collected two composite samples from the stockpiled soils (EP-EC and EP-WC). The laboratory results for these samples are provided in Appendix C. VOCs and chlorinated herbicides were non-detected for both samples. Nitrate-N was 330 and 540 mg/Kg for EP-EC and EP-WC, respectively. Ammonium-N was 760 and 640 mg/Kg for EP-EC and EP-WC, respectively. Based on soil sampling results for VOCs, chlorinated pesticides, and nitrogen, and also based on previous soil sampling results and Simplot's knowledge of site activities, these stockpiled soils are not considered hazardous waste. Soils were later removed from site and used for land application (permitted through Benton-Franklin Health District).

Table 3-19. Excavation Soil Sample Results - Pesticides

Sample Location	ES-EB	ES-ET	EB-E	ES-NB	ES-NT	EB-W	ES-SB	ES-ST	ES-WB	ES-WT
Parameter/ Depth (ft)	**8 to 9**	**3 to 4**	**9 to 9.5**	**3 to 4**	**3 to 4**	**9 to 9.5**	**8 to 9**	**3 to 4**	**8 to 9**	**3 to 4**
Herbicides - EPA Method 8151 (mg/kg)										
2,4-D	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dalapon	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,4-DB	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dicamba	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dichloropropane	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
Dinoseb	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MCPA	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MCPP	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,4,5-T	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
2,4,5-TP (Silvex)	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.
BDL = below detection limit; mg/Kg = milligrams per kilogram; ft = feet.

3.3.3.2 Subsurface Drains

With the construction of the Sunnyside Canal in the late 1800s, irrigated agriculture was brought to the Sunnyside area. Using flood irrigation in fields caused the water table to rise, resulting in the flooding of basements and low lying areas. In response, underdrains were installed throughout the area. The purpose of these drains was to lower the groundwater table to prevent flooding. In addition to the underdrain system, the City installed a stormwater conveyance system consisting of catch basins, manholes, and piping.

In the project area, the Sunnyside Irrigation District (SVID) operates and maintains the DR3 system, which is a subsurface drain system that conveys mostly groundwater (drain water) to Sulphur Creek and then to Yakima River. Piping is typically concrete or clay with open joints. While the piping is solid, the joints are typically set half an inch apart to allow for groundwater infiltration. In many places, the system is interconnected with stormwater drainage, and the distinction between SVID drainage system and City stormwater system is not always clear. **Figure 10** illustrates the underdrainage and stormwater system in the project area.

Figure 10: Area Wide Drain System
Simplot Grower Solutions, Sunnyside, WA

Imagery: Bing Online Imagery Service
Source: (c) 2010 Microsoft Corporation and its data suppliers

Map Date: Monday, July 30, 2012
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

HDR ONE COMPANY Many Solutions

There are four drain systems within the site area (City workers, September 2012).

- Old Under-Drain System - The oldest and deepest set of drains, referred to as "underdrains," was installed during City development in the early 1900s. Today, little is known about this drain system. There is no known access to these under-drains in the area and the effectiveness of the drains for controlling groundwater elevation in the project area is uncertain.
- SVID Drain System - The second subsurface drain system in the project area was installed over 80 years ago and today is managed by the SVID. In the project area, this system conveys mostly groundwater in a southeasterly direction to Sulphur Creek and then to Yakima River. Piping is typically concrete or clay with open joints. While the piping is solid, the joints are typically set half an inch apart to allow for groundwater infiltration. The drain system continues to pick up groundwater through the Sunnyside area, which could include shallow groundwater within the site area.
- City Storm Drain System - The City also maintains a stormwater drain system in the area, which is the third series of subsurface drains. This system was installed in the 1960s. It consists of clay pipes and is predominantly a closed-pipe system. In many places, the SVID and City systems are interconnected, and the distinction between water conveyed within SVID drainage system and City of Sunnyside stormwater system is not always clear. The combination of all three subsurface drain systems makes it complex to assess subsurface drainage on shallow groundwater.
- Industrial System - The fourth subsurface drain system in the area is related to industrial facilities that pipe industrial wastewater and on-site stormwater to the Port of Sunnyside's wastewater treatment plant. City municipal sewer pipes are also in the area. These pipes are not believed to act as groundwater drains; however, it is possible for incidental inflow and infiltration (I&I) of groundwater into these pipes.

In June 2012, Stantec sampled subsurface drain water on behalf of CEMC and ARCO – the responsible parties for the Bee-Jay Scales site. The assessment included water quality sampling and flow measurements in 21 manholes covering an approximate half-mile square area, which included Simplot's site. Water quality results indicated that nitrates and some other constituents were elevated in some samples, with concentrations of nitrate-N ranging between 9.2 and 13.6 milligrams per liter (mg/L) in the drains east of S. 1st Street and north of Zillah. Unfortunately, Stantec was unable to determine discharge and constituent loading (e.g., pounds [lbs] per day), which would allow for a determination of potential pollutant contribution to the drains via groundwater infiltration, if any.

After the Stantec sampling, Ecology requested that Simplot perform a similar subsurface drain study, including flows and water quality samples so that loads could be calculated. The area of study would be the drainage system downgradient of Simplot's facility, which is to the east. The goal would be to attempt to establish if impacted shallow groundwater from Simplot's site was entering a drain system.

On September 12, 2012, HDR, SVID, and the City conducted a visual assessment of the drain system downgradient of the Simplot site. At that time, the City's drains were dry as there had been no precipitation, and the only flows would be assumed to be groundwater and SVID irrigation water.

Manhole covers east of the Simplot site were pulled in order to observe manhole construction and if water was flowing at the time through the attached piping.

The north-south drain on the west side of S. 3rd Street, with corresponding manholes M-14 and M-15 (**Figure 10**), had water flowing through it at the time of the visit. Water flows to the M-14 location from the west and east in pipes along the south side of Blaine Street, and then is piped down S. 3rd Street. In June 2012, nitrate-N concentrations in M-14 and M-15 were 12.3 and 12.6 mg/L, respectively (Stantec 2012). According to the City, the piping along 3rd Street is solid piping with solid joints and is not intended to serve as a groundwater drain. The City indicated that it is unlikely groundwater would enter the piping in this area. However, water was flowing through the pipe in September, which would indicate either some connection with SVID drains or that these drains may not be closed pipes.

Manhole M-18, east of S. 3rd Street was dry during the site visit, and is part of the City's storm drain system (**Figure 10**).

Following source removal and monitoring well activities conducted in fall 2012, Simplot submitted *Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Report* (HDR 2013a) to Ecology in February 2013. In the document, HDR made the following recommendation regarding sampling of drains:

- Flow and concentrations in the drain pipe on the west side of 3rd Street should be further characterized to confirm the assumption that groundwater is not entering this system. It was recommended that samples and flow be determined at manholes M-14, M-15, and M-16.

HDR's field team used a Marsh-McBirney flow meter (flo-mate 2000) equipped with a wading rod to measure average velocity in the drains. Average open channel flow was calculated using the mean velocity and cross-section area following procedures outlined in the *Open Channel Profiling Handbook* (Marsh-McBirney 1994). From flow and constituent concentration, the constituent load (expressed in pounds per day [lbs/d]) passing through the manhole (through the pipe system) was estimated.

In addition to velocity measurements, HDR's field team collected water samples using a disposal bailer for in-field analysis for pH, conductivity, and temperature. The field team placed the samples into laboratory-supplied sample bottles for analysis for chloride, sulfate, total phosphorus, nitrate, and ammonium (**Table 3-20**). Sampling protocol followed the *Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Work Plan* (HDR 2012a). Samples were analyzed by Kuo Testing Labs, Inc. of Othello, Washington. Laboratory reports are presented in Appendix C.

Table 3-20. Proposed Laboratory Analyses for Drain Assessment

Analytical Parameter	Method	Preservative
Chloride and sulfate	EPA 300.0	4°C
Ortho- phosphorus	SM20 4500 PE	4°C
Total phosphorus	SM20 4500 PE	Sulfuric Acid (H_2SO_4)
Nitrate-N	EPA 353.2 or EPA 300.0	Sulfuric Acid (H_2SO_4)
Ammonium-N	SM20 4500 NH3 D	Sulfuric Acid (H_2SO_4)

Table 3-21 summarizes the findings of field measurements and analytical sample results from the April 2013 activities. **Figure 10** illustrates drain and manhole locations and **Figure 11** illustrates selected data from sampled drains (note that drain M-18 was dry at the time of sampling).

Table 3-21. Summary of Data from Monitoring and Samples from Drain Manholes, April 2013

Manhole ID	M - 13	M - 14	M - 15	M - 16	M - 17
Depth to Water (ft)	15.4	15.4	14.9	14.6	14.4
Pipe Diameter (in)	30	30	24	30	30
Depth of Water (ft)	0.50	0.30	0.25	0.40	NA
Avg. Flow Velocity (ft/s)	1.52	NA	1.25	1.06	NA
Discharge Flow (cfs)	1.17	NA	0.559	0.978	NA
Flow Direction	E to M-14	S to M-15	S to M-16	SE to M-21	W to M-14
pH	7.5	7.4	7.1	7.5	7.7
Temperature (°C)	14.2	14.5	14.4	15.0	14.4
Conductivity (mS/cm)	0.626	0.636	0.627	0.644	0.581
Chloride Concentration (mg/L)	28.0	28.5	26.0	31.0	22.0
Chloride Load (lbs/d)	176	NA	78.5	164	NA
Sulfate Concentration (mg/L)	49.0	50.0	51.0	52.0	61.0
Sulfate Load (lbs/d)	308	NA	154	275	NA
Total Phosphorus (mg/L)	0.190	0.189	0.131	0.123	0.136
Phosphorus Load (lbs/d)	1.20	NA	0.395	0.650	NA
Nitrate-N Concentration (mg/L)	12.5	12.3	12.4	11.8	11.4
Nitrate Load (lbs/d)	78.6	NA	37.4	62.3	NA
Ammonia-N Concentration (mg/L)	0.510	0.560	0.810	0.690	2.98
Ammonia Load (lbs/d)	3.21	NA	2.45	3.64	NA
Comments		non-laminar flow			8-inch pipe at about 3 feet flowing into manhole and mixing with large drain water

ft=feet; in=inches; ft/s=feet per second; cfs=cubic feet per second; mS/cm=microsiemens per centimeter; mg/L=milligrams per liter; lbs/d=pounds per day

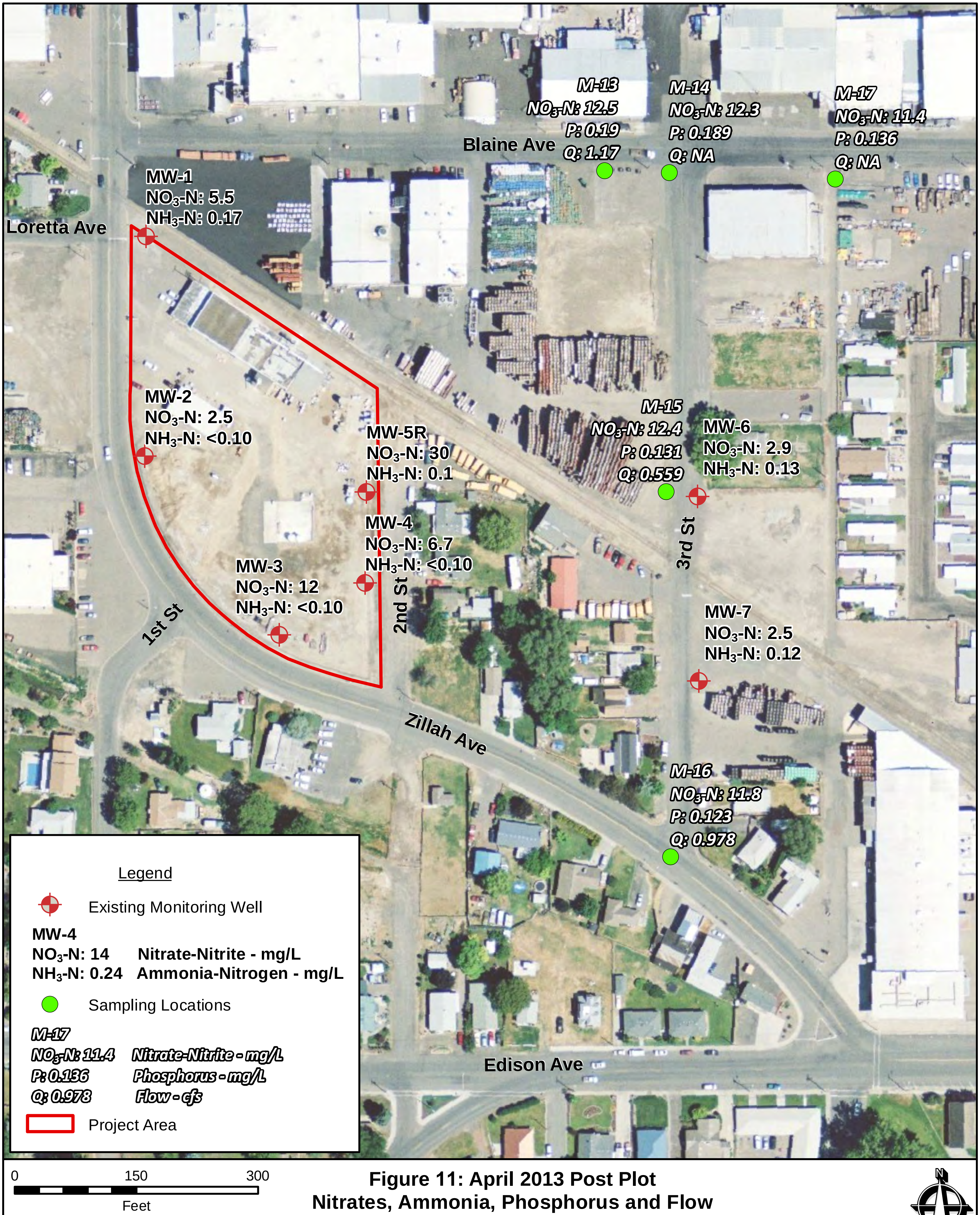


Figure 11: April 2013 Post Plot
Nitrates, Ammonia, Phosphorus and Flow
Simplot Grower Solutions, Sunnyside, WA

Imagery: 2011 Yakima 0.5 ft, ESRI World Imagery Map Service
Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Map Date: Friday, September 27, 2013
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

HDR ONE COMPANY *Many Solutions*℠

The drain flow pattern is illustrated in **Figure 10**. Water flows from manholes M-13 and M-17 into M-14 and then toward M-15 and M-16. If groundwater were entering the system, flows would be expected to increase from M-14 to M-15 to M-16 (groundwater flow from the site would be expected to intercept the piping in the area of M-15). While M-16 has a slightly larger flow than M-15, the largest flow was M-13, which is upgradient. Furthermore, M-13 has a higher nitrate-N concentration and load compared to downgradient drains M-15 and M-16. Nitrate load calculations do increase in M-16 compared to M-15, suggesting that nitrate quantity is increasing, possibly suggesting inflow. However, the load is less than calculated for M-13.

In April 2013, HDR's field team measured flow velocity and collected water samples from five manholes associated with the underground drain system. Constituent loadings, concentrations, and flows remained relatively constant throughout the system, though there was a slight increase in flow and nitrate loading between M-15 and M-16 (thought the upgradient M-13 had higher flows and loadings). As described previously, there are multiple drain systems, including the "old under-drain system," which is the oldest and deepest set of drains (but no mapping of this system is available). Thus, while the drain system along 3rd Street has been identified and monitored, there may be other drains that have not been identified.

3.3.3.3 2013 Groundwater Monitoring Well Construction and Sampling

In November 2012, two off-site monitoring wells were installed downgradient of the Simplot site (MW-6 and MW-7). Additionally, on-site monitoring well MW-5 was abandoned due to the soil excavation, and MW-5R was installed on site to replace MW-5 (**Figure 11**).

Well construction followed similar design and approach as the previous monitoring wells (HDR 2013b). Well construction details are summarized in **Table 3-22**.

Table 3-22. Well Construction Details

Monitoring Well	Top PVC Elevation (ft amsl)	Depth of Well (ft bgs)	Screen Depth (ft bgs)
MW-5R	735.41	21.6	11-21
MW-6	736.84	21.6	6.0-21.0
MW-7	734.43	24.45	9.0-24.0

ft amsl = feet above mean sea level; ft bgs = feet below ground surface

Following well construction, all seven groundwater monitoring wells were sampled on December 5, 2012. Field sampling activities conducted during the December event followed the *Standard Operating Procedure for Groundwater Sampling* that was included in Appendix A of the work plan (HDR 2010). Samples were analyzed for the same parameters listed in **Table 3-15**. Results are summarized in **Table 3-25** in Section 3.4.4.

Depth to groundwater at each monitoring well was measured on December 5, 2012, following construction and survey of the off-site wells and MW-5R (**Table 3-23**).

Table 3-23. Groundwater Elevation Measurement, December 5, 2012

Well	Measured Depth to Water (ft)	Reference Elevation[1] (ft)	Groundwater Elevation (ft)
MW-1	11.17	745.76	737.59
MW-2	9.3	745.34	736.91
MW-3	12.86	745.58	735.37
MW-4	12.56	744.95	734.8
MW-5R	10.32	745.15	735.09
MW-6	12.58	743.46	730.88
MW-7	12.39	743.06	730.67

[1] Top of casing elevation surveyed by Permit Surveying, Inc.; ft = feet

Figure 12 illustrates the December 2012 groundwater elevation contours. The calculated shallow groundwater flow direction is to the east (98.10 degrees from north) at a gradient of 0.009 feet per foot (ft/ft). Based on the observed groundwater flow, the following wells are deemed up, down, or crossgradient as follows:

- MW-1 – upgradient well
- MW-2 – upgradient well
- MW-3 –side or downgradient well
- MW-4 - downgradient well
- MW-5R – downgradient well
- MW-6 – downgradient well
- MW-7 – downgradient well

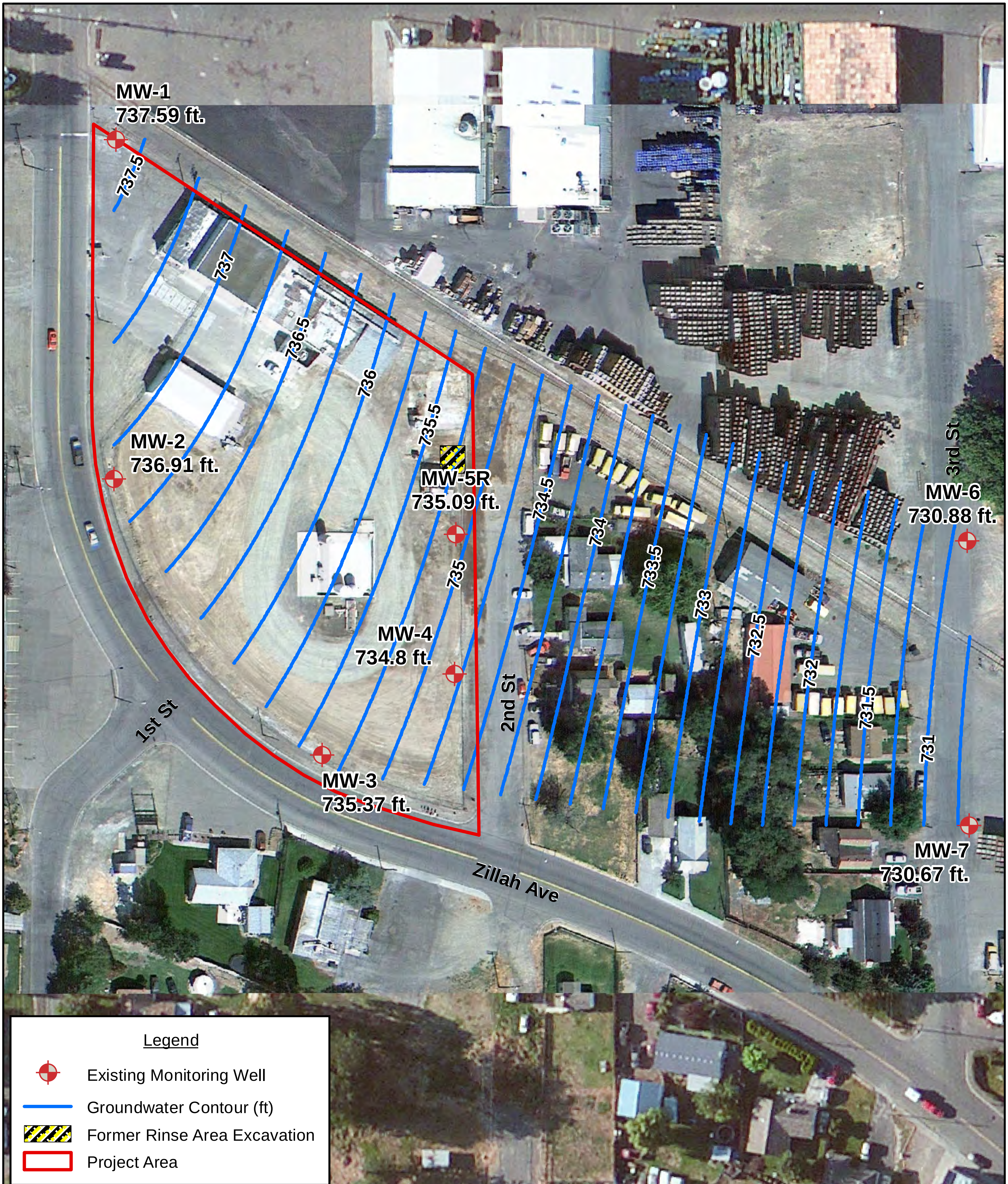


Figure 12: December 2012 Groundwater Isopleths

Simplot Grower Solutions, Sunnyside, WA

Imagery: Google Earth; Bing Online Imagery Service
Source: (c) Google Earth; (c) 2010 Microsoft Corporation and its data suppliers

Map Date: Thursday, February 07, 2013
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

HDR | ONE COMPANY *Many Solutions*℠

3.4 2010 through 2018 Groundwater Monitoring

3.4.1 References

- HDR. 2011. *Monitoring Well Construction and Sampling Report*. April 2011.
- HDR. 2012c. *2011 Monitoring Well Sampling Report*. May 2012.
- HDR. 2013a. *Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Report*. February 2013
- HDR. 2013b. *Supplemental Drain Evaluation and Monitoring Well Sampling Report*. September 2013.
- HDR. 2015a. *Monitoring Well Sampling Update.* Simplot Growers Solutions. February 4, 2015.
- HDR. 2015b. *Monitoring Well Sampling Update*. Simplot Grower Solutions. July 2015.
- HDR. 2015c. *Monitoring Well Sampling Update*. Simplot Grower Solutions. November 2015.
- HDR. 2016. *Monitoring Well Sampling Update*. Simplot Grower Solutions. June 2016.
- HDR. 2017a. *Monitoring Well Sampling Update*. Simplot Grower Solutions. January 2017
- HDR. 2017b. *Monitoring Well Sampling Updat*e. Simplot Grower Solutions. July 2017.
- HDR. 2018a. *Monitoring Well Sampling Update*. Simplot Grower Solutions. January 2018.
- HDR. 2018b. *Monitoring Well Sampling Update*. Simplot Grower Solutions. June 2018.

3.4.2 Data Objectives and Needs

Groundwater monitoring objectives were to collect groundwater quality samples to assess groundwater conditions and also to assess trends in groundwater COCs over time.

3.4.3 Groundwater Monitoring Activities

HDR sampled Simplot's groundwater monitoring wells on the following dates:

- March 17, 2011
- June 30, 2011
- September 15, 2011
- December 5, 2012
- April 4, 2013
- July 24,2013
- October 9, 2013
- October 28, 2014
- April 29, 2015
- October 14, 2015
- April 19, 2016
- October 31, 2016
- May 3, 2017
- December 28, 2017
- April 25,2018

Sampling protocol followed the *Standard Operating Procedure for Groundwater Sampling* that was included in Appendix A of the work plan (HDR 2012a). Simplot submitted groundwater sampling protocols, field sampling sheets, laboratory reports, data validation reports, and interpretation of results to Ecology (see listing of reference in Section 3.4.1). Quality assurance/quality control (QA/QC) included collecting a field duplicate, trip blank, and field blank. Analytical parameters are listed in **Table 3-15**, where analysis was later reduced to VOCs, Resource Conservation and Recovery Act (RCRA) metals, and nitrate and ammonia. This reduction was based on chlorinated pesticides being non-detected and polynuclear aromatic hydrocarbons (PAHs) either being non-detected or below MTCA cleanup levels (see Section 4.0 for further discussion of COCs and MTCA cleanup levels). A summary of groundwater sampling results is presented in **Table 3-25** (only constituents with at least detection is presented). Laboratory reports are presented in Appendix C.

3.4.4 Groundwater Elevations and Contour Maps

The reports referenced in Section 3.4.1 provide information on depth to groundwater and calculated groundwater elevations. Groundwater isopleth maps for all sampling events are presented in Appendix C. The groundwater flow direction has been consistently toward the east/southeast direction.

Depth to groundwater at each monitoring well in April 2018 and at MW-7 only in June 2018 is presented in **Table 3-24.**

Table 3-24. Depth to Groundwater and Groundwater Elevations for April 25, 2018

Well	Reference Elevation[1]	Measured Depth to Water	Groundwater Elevation
	(feet)		
April 25, 2018			
MW-1	745.76	9.03	736.73
MW-2	745.34	9.48	735.86
MW-3	745.58	11.11	734.47
MW-4	744.95	11.00	733.95
MW-5R	745.41	11.06	734.35
MW-6	743.46	12.76	730.70
MW-7	743.06	12.59	730.47
June 20, 2018			
MW-7	743.06	12.71	730.35

[1] Top of casing elevation surveyed by Permit Surveying, Inc.

Figure 13 illustrates groundwater elevation contours for September 2018. The calculated shallow groundwater flow direction is to the southeast (approximately 101.5 degrees from north) at a gradient of 0.026 ft/ft. Based on the observed groundwater flow, the following wells are deemed up, down, or cross-gradient as follows:

- MW-1 – upgradient well
- MW-2 – upgradient well
- MW-3 –side or downgradient well
- MW-4 - downgradient well
- MW-5R – downgradient well
- MW-6 – downgradient well
- MW-7 – downgradient well

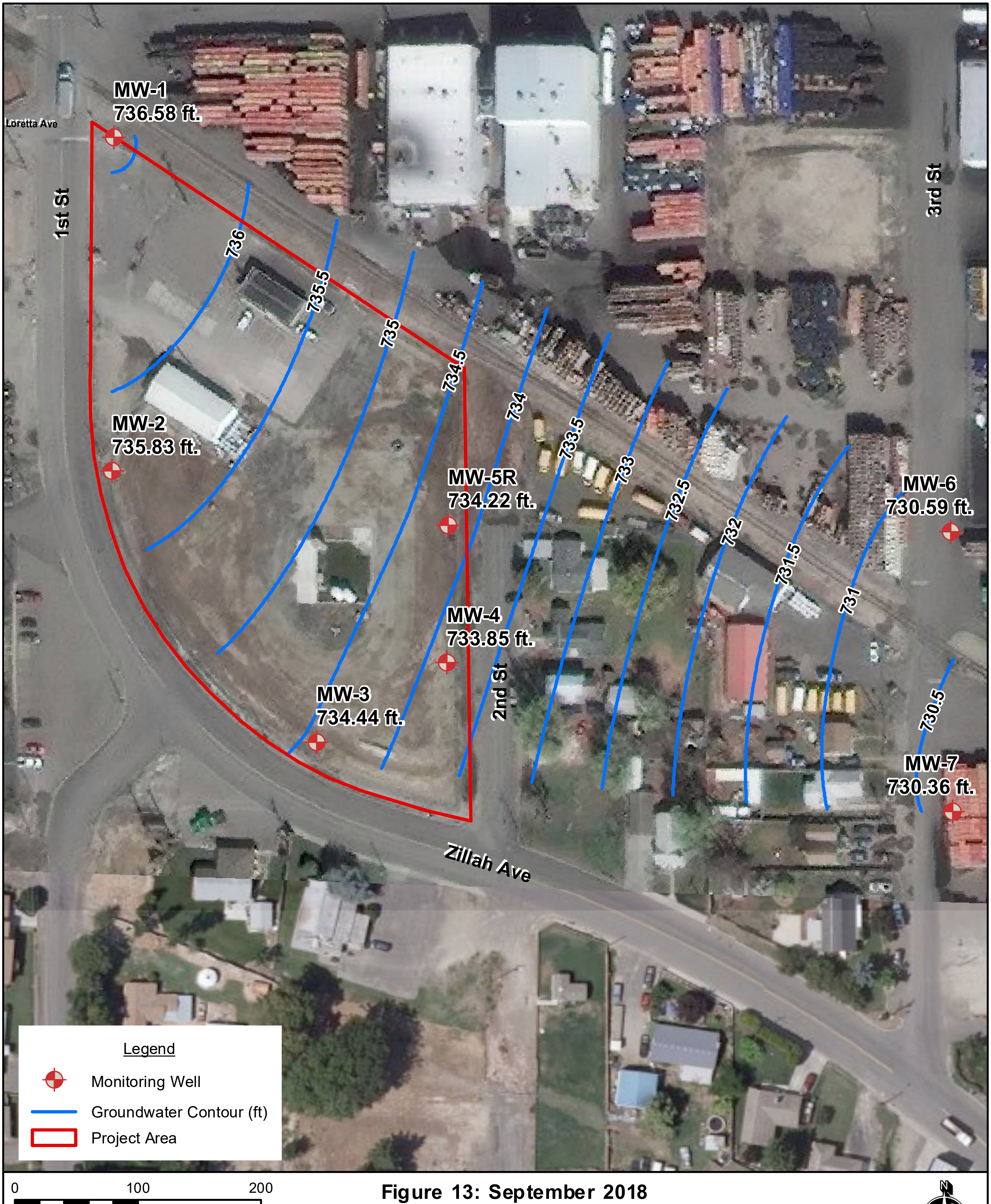


Figure 13: September 2018
Groundwater Isopleths
Simplot Grower Solutions, Sunnyside, WA

Imagery: March 27 2015 0.5 m resolution; Copyright Terraserver 2013 Yakima 0.5 ft, ESRI World Imagery Map Service; Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Map Date: Wednesday, September 26, 2018
Q:\Simplot\Sunnyside\map_docs\SiteMap.mxd

Table 3-25. Summary of Compounds Detected in Groundwater

Detected Compounds (mg/L)	3/17/2011	6/30/2011	9/15/2011	12/16/2011	12/5/2012	4/4/2013	7/24/2013	10/9/2013	10/28/2014	4/29/2015	10/14/2015	4/19/2016	10/31/2016	5/3/2017	12/28/2017	4/25/2018
MW-1																
Sulfate	NA	NA	NA	NA	NA	140	130	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen	0.52	0.77	0.49	0.66	0.16	0.17	0.18	0.14	<0.25	<0.25	0.0414	0.075	0.124	0.112	<0.100	<0.10
Nitrate-Nitrite	8.3	7.8	6.4	5.6	7.5	5.5	5.9	5.1	6.2	4.1	5.78	7.6	1.8	11.5	5.71	7.2
Arsenic (dissolved)	<0.020	0.049	0.038	0.036	0.034	0.037	<0.020	0.04	0.043	0.03	0.0478	0.0418	0.0423	0.0402	0.0473	0.0861
Barium (dissolved)	0.065	0.12	0.053	0.034	0.09	0.04	0.057	0.051	0.064	0.057	0.0554	0.0512	0.0681	0.0721	0.0524	1.49
Cadmium (dissolved)	<0.0050	0.0055	<0.0050	<0.0050	<0.0050	<0.0050	0.0058	<0.0050	<0.0050	0.0015	<0.0050	<0.0050	<0.0050	<0.0020	<0.00200	0.0011
Lead (dissolved)	0.011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.020	<0.020	<0.020	0.00455	<0.020	<0.020	<0.0050	<0.00500	0.0438
Selenium (dissolved)	<0.020	0.038	<0.020	<0.020	<0.020	<0.020	0.02	<0.020	<0.020	0.0088	0.00902	<0.020	<0.020	0.00924	0.00841	0.0116
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00068
Trichloroethene	0.0033	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00100	<0.00040
Residual Range Organics	<0.32	<0.25	0.44	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	NA	NA	NA	NA	NA	NA
Diesel Range Organics	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.045	NA	NA	NA	NA	NA	NA
Benzo (a) anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.90E-06	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000027	<0.0010	<0.00100	<0.00100	<0.00500	<0.00500	<0.004
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.50E-06	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000012	NA	NA	NA	NA	NA	NA
MW-2																
Sulfate	NA	NA	NA	NA	NA	290	340	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen	0.17	<0.10	0.22	0.18	<0.10	<0.10	0.1	0.077	<0.25	<0.25	<0.25	0.063	<0.25	0.12	<0.100	<0.10
Nitrate-Nitrite	7.1	5.8	6.2	5.1	3.4	2.5	2.6	2.8	2.2	2.2	2.6	2.81	2.98	3.4	3.28	3.5
Arsenic (dissolved)	0.058	0.081	0.11	0.083	0.06	0.067	0.029	0.064	0.06	0.047	0.053	0.0505	0.0551	0.0543	0.0618	0.0659
Barium (dissolved)	0.037	0.091	0.049	0.037	0.053	0.056	0.064	0.061	0.07	0.082	0.089	0.0606	0.06	0.0495	0.0378	0.181
Cadmium (dissolved)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0053	<0.0050	<0.0050	0.0012	<0.0050	<0.0050	<0.0050	0.002	<0.0020	0.00011
Chromium, (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0086
Lead (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0062
Selenium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0033
Trichloroethene	0.0016	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Diesel Range Organics (DRO)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.049	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.40E-06	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.10E-06	NA	NA	NA	NA	NA	NA
MW-3																
Sulfate	NA	NA	NA	NA	NA	590	630	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	0.086	<0.25	<0.25	0.0853	0.058	<0.25	0.047	<0.100	<0.10
Nitrate-Nitrite	7	8.5	11	9.3	11	12	18	7.7	16	16	14.9	12.1	10.1	10.4	7.49	6.7
Arsenic (dissolved)	0.027	0.062	0.038	0.062	0.036	0.05	<0.020	0.039	0.046	0.026	0.0554	0.0521	0.052	0.0598	0.057	0.0916
Barium (dissolved)	0.072	0.053	0.046	0.038	0.046	0.043	0.046	0.044	0.045	0.044	0.242	0.0344	0.0382	0.0342	0.0324	1.03
Cadmium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0004
Chromium, (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.00694	<0.0100	0.00148	<0.0100	<0.0100	0.0592
Lead (dissolved)	0.027	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.016	<0.0050	<0.0050	<0.0050	<0.0050	0.0356
Selenium (dissolved)	0.036	0.095	<0.020	0.021	0.034	0.04	0.065	0.038	0.034	0.031	0.0358	0.0273	0.0259	0.0262	0.0201	0.0231
Trichloroethene	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0004

Table 3-25. Summary of Compounds Detected in Groundwater

Detected Compounds (mg/L)	3/17/2011	6/30/2011	9/15/2011	12/16/2011	12/5/2012	4/4/2013	7/24/2013	10/9/2013	10/28/2014	4/29/2015	10/14/2015	4/19/2016	10/31/2016	5/3/2017	12/28/2017	4/25/2018
Diesel Range Organics (DRO)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.17	NA	NA	NA	NA	NA	NA
Residual Range Organics (RRO)	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.11	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000027	<0.0010	<0.0010	NA	<0.0050	<0.0050	0.004
MW-4																
Sulfate	NA	NA	NA	NA	NA	140	120	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen	0.24	<0.10	0.11	0.4	<0.10	<0.10	0.11	0.074	<0.25	<0.25	<0.25	0.048	<0.25	0.039	<0.100	0.1
Nitrate-Nitrite	14	9.6	8.4	7.8	79	6.7	5.1	4.8	6.6	6.2	9.66	11.1	123 (48.4)[1]	74	28.5	38
Arsenic (dissolved)	<0.020	0.04	0.028	0.031	0.024	0.024	<0.020	0.027	0.032	0.017	0.0302	0.0251	0.0356	0.0315	0.0273	0.0477
Barium (dissolved)	0.054	0.043	0.11	0.041	0.13	0.038	0.039	0.04	0.049	0.055	0.043	0.0362	0.0974	0.0386	0.0436	0.586
Cadmium (dissolved)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0064	<0.0050	<0.0050	0.00081	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020	0.00032
Chromium (dissolved)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0324
Lead (dissolved)	0.012	<0.0050	0.0062	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.00541	<0.0050	<0.0050	<0.0050	<0.0050	0.0234
Selenium (dissolved)	<0.020	0.039	<0.020	<0.020	<0.020	<0.020	0.023	<0.020	<0.020	<0.020	<0.020	<0.020	0.0289	0.0128	0.0089	0.0074
1,2-Dichloropropane	0.014	0.016	0.0056	0.004	0.065	0.0054	0.005	0.0046	0.0063	0.0063	0.00689	0.00752	0.0603	0.0492	0.0428	0.0686
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.80E-06	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.000049	NA	NA	NA	<0.0050	<0.0050	<0.0040
MW-5																
Ammonia-Nitrogen	860	480	850	370												
Nitrate-Nitrite	530	200	310	290												
Arsenic (dissolved)	0.074	0.18	0.16	0.23												
Barium (dissolved)	0.12	0.04	0.038	0.054												
Cadmium (dissolved)	<0.0050	0.0061	<0.0050	<0.0050												
Lead (dissolved)	0.0074	<0.0050	<0.0050	<0.0050												
Gasoline Range Organics	1.5	1.5	0.86	1.8												
Acrolein	<0.25	<0.25	<0.050	0.068												
Benzene	0.18	0.16	0.077	0.14												
Chlorobenzene	0.0056	0.0055	0.0035	0.0042												
2-Chlorotoluene	<0.0050	<0.0050	<0.0010	0.003												
1,2-Dichloroethane	0.18	0.11	0.082	0.18												
1,2-Dichloropropane	0.012	0.0091	0.0052	0.0093	Well abandoned (November-2012) due to excavation											
Ethylbenzene	<0.0050	<0.0050	0.0011	0.0011												
Isopropylbenzene	<0.0050	<0.0050	0.0024	0.0032												
n-Propylbenzene	0.0068	0.0072	0.005	0.0071												
1,2,4-Trimethylbenzene	0.082	0.068	0.048	0.084												
1,2,3-Trimethylbenzene	0.024	0.02	0.012	0.021												
1,3,5-Trimethylbenzene	0.024	0.021	0.015	0.024												
Xylenes, Total	0.25	0.2	0.14	0.2												
Diesel Range Organics	1.5	1.4	0.61	2												
Residual Range Organics	<0.32	<0.25	<0.25	0.26												
Fluorene	<0.000050	<0.000050	<0.00005	0.000055												
Naphthalene	0.026	0.016	0.017	0.028												
Phenanthrene	<0.000050	<0.000050	<0.000050	0.00026												

Table 3-25. Summary of Compounds Detected in Groundwater

Detected Compounds (mg/L)	3/17/2011	6/30/2011	9/15/2011	12/16/2011	12/5/2012	4/4/2013	7/24/2013	10/9/2013	10/28/2014	4/29/2015	10/14/2015	4/19/2016	10/31/2016	5/3/2017	12/28/2017	4/25/2018
Pyrene	<0.000050	<0.000050	<0.000050	0.000053												
1-Methylnaphthalene	0.0044	0.003	0.0026	0.0039												
2-Methylnaphthalene	0.0061	0.004	0.0034	0.0048												
2,4-D	<0.0020	<0.0020	0.03	0.036												
Dinoseb	0.0088	0.0094	0.0098	<0.010												
MW-5R																
Sulfate					NA	350	340	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen					0.17	0.1	0.1	<0.10	<0.25	<0.25	<0.25	0.059	<0.25	0.058	<0.100	<0.10
Nitrate-Nitrite					35	30	51	51	33	22	21	18.4	22	24.8	21.1	16.8
Arsenic (dissolved)					0.05	0.066	0.027	0.064	0.081	0.068	0.0869	0.0781	0.0809	0.0759	0.0783	0.0956
Barium (dissolved)					0.054	0.035	0.04	0.035	0.036	0.031	0.107	0.0325	0.0396	0.0352	0.0361	0.493
Cadmium (dissolved)					<0.0050	<0.0050	0.0067	<0.0050	<0.0050	0.0028	0.000867	0.00147	<0.0050	0.00148	0.00129	0.0011
Chromium, (dissolved)	Well installed November 2012				NA	NA	NA	NA	NA	NA	0.00338	<0.0100	<0.0100	0.0015	<0.0100	0.0264
Lead (dissolved)					<0.0050	<0.0050	0.0053	<0.0050	<0.0050	<0.0050	0.0128	<0.0050	<0.0050	<0.0050	0.00773	0.0212
Selenium (dissolved)					<0.020	<0.020	0.028	0.022	<0.020	0.012	0.0098	<0.00140	<0.00140	<0.0100	<0.0100	0.0109
1,2-Dichloroethane					0.0051	0.0045	0.004	0.0056	0.0044	0.0031	0.0028	0.0028	0.003	0.00374	0.00248	0.0032
Diesel Range Organics (DRO)					NA	NA	NA	NA	NA	0.054	NA	NA	NA	NA	NA	NA
Naphthalene					NA	NA	NA	NA	NA	0.00003	<0.00100	<0.00100	<0.00100	<0.00500	<0.00500	<0.0040
MW-6																
Sulfate					NA	36	37	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen					<0.10	0.13	<0.10	0.12	<0.25	<0.25	0.0517	0.056	<0.25	0.057	<0.100	<0.10
Nitrate-Nitrite					2.7	2.9	2.9	2.5	2.8	2.3	3.4	3.42	3.07	3.7	3.19	3.2
Arsenic (dissolved)					<0.020	<0.020	<0.020	<0.020	0.023	0.0088	0.0208	0.0158	0.0197	0.017	0.0162	0.0295
Barium (dissolved)					0.11	0.062	0.07	0.064	0.065	0.066	0.115	0.0657	0.0695	0.0655	0.0661	0.502
Cadmium (dissolved)	Well installed November 2012				<0.0050	<0.0050	0.0083	<0.0050	<0.0050	0.00073	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020	0.00044
Chromium,(dissolved)					NA	NA	NA	NA	NA	NA	0.00702	0.00378	0.00393	0.00419	0.00311	0.033
Lead (dissolved)					<0.0050	<0.0050	0.0064	<0.0050	<0.0050	0.0028	0.0117	<0.0050	<0.0050	<0.0050	<0.0050	0.0179
Selenium (dissolved)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0035
Diesel Range Organics (DRO)					NA	NA	NA	NA	NA	0.039	NA	NA	NA	NA	NA	NA
Naphthalene					NA	NA	NA	NA	NA	0.000079	<0.00100	<0.00100	<0.00100	<0.0050	<0.0050	<0.0040
MW-7																
Sulfate					NA	35	35	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-Nitrogen					<0.10	0.12	0.16	<0.10	<0.25	<0.25	<0.25	0.063	<0.25	0.054	<0.100	<0.10 (<0.10)[2]
Nitrate-Nitrite					2.4	2.5	1.9	2.5	2.2	2.3	2.97	2.81	2.5	3.06	2.62	15.7 (2.4)[2]
Arsenic (dissolved)	Well installed November 2012				NA	NA	NA	NA	NA	NA	0.0137	0.0136	0.0103	0.012	0.0141	0.0618 (0.0098)[2]
Barium (dissolved)					0.12	0.068	0.098	0.074	0.066	0.074	0.0741	0.0726	0.0738	0.0719	0.0707	2.19 (0.069)[2]
Cadmium (dissolved)					<0.0050	<0.0050	0.0077	<0.0050	<0.0050	0.00076	<0.0050	<0.0050	<0.0050	<0.0020	<0.0020	0.0017 (<0.00008)[2]
Chromium (dissolved)					NA	NA	NA	NA	NA	0.0029	0.00316	0.00325	0.00362	0.00348	0.00273	0.131 (0.003)[2]

Table 3-25. Summary of Compounds Detected in Groundwater

Detected Compounds (mg/L)	3/17/2011	6/30/2011	9/15/2011	12/16/2011	12/5/2012	4/4/2013	7/24/2013	10/9/2013	10/28/2014	4/29/2015	10/14/2015	4/19/2016	10/31/2016	5/3/2017	12/28/2017	4/25/2018
Lead (dissolved)					NA	NA	NA	NA	NA	0.0074	0.0074	<0.0050	<0.0050	<0.0050	<0.0050	0.0531 (0.00015)[2]
Selenium (dissolved)					NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.0151 (0.0017)[2]
Naphthalene					NA	NA	NA	NA	NA	0.00057	<0.00100	<0.00100	<0.00100	<0.0050	<0.0050	<0.0040 (<0.0040)[2]
Phenanthrene					NA	NA	NA	NA	NA	0.000012	NA	NA	NA	NA	NA	NA
1-Methylnaphthalene					NA	NA	NA	NA	NA	0.000018	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene					NA	NA	NA	NA	NA	0.000028	NA	NA	NA	NA	NA	NA

Notes:
Table shows compounds that were above detection limit at some time during sampling events. Laboratory reports are presented in Appendix C. See Laboratory reports for Method Detection Limits.
mg/L = milligrams per liter; NA = Constituent not analyzed during this sampling event.
[1] MW-4 was resampled November 15, 2016.
[2] MW-7 was resampled June 20, 2018 due the unexpected high nitrate-N concentration in April sampling event.

3.4.4.1 Nitrate-N Trends in Individual Wells

Table 3-26 summarizes nitrate-N concentrations for each well over the sampling period. Using ProUCL software, HDR ran the Mann-Kendall Trend Test Analysis for nitrate concentrations in each well. Trend plots are presented in **Figure 14**. Results for the statistical trend analysis for nitrate-N are as follows (see bottom row in **Table 3-26**):

- Downgradient well MW-5R shows a decreasing trend
- Downgradient well MW-6 shows an increasing trend but remains below 4 mg/L nitrate-N.
- Upgradient wells MW-1, MW-2, and MW-3 (side to downgradient) and downgradient wells MW-4 and MW-7 show no statistically significant trend

Table 3-26. Nitrate-N Concentrations Over Time and Trend Analysis

Sampling Date	MW-1	MW-2	MW-3	MW-4	MW-5R	MW-6	MW-7
	milligrams per liter (mg/L)						
3/17/2011	8.3	7.1	7.0	14			
6/30/2011	7.8	5.8	8.5	9.6			
9/15/2011	6.4	6.2	11	8.4			
12/16/2011	5.6	5.1	9.3	7.8			
12/5/2012	7.5	3.4	11	79	35	2.7	2.4
4/4/2013	5.5	2.5	12	6.7	30	2.9	2.5
7/24/2013	5.9	2.6	18	5.1	51	2.9	1.9
10/9/2013	5.1	2.8	7.7	4.8	51	2.5	2.5
10/28/2014	6.2	2.2	16	6.6	33	2.8	2.2
4/29/2015	4.1	2.2	16	6.2	22	2.3	2.3
10/14/2015	5.8	2.6	15	9.7	21	3.4	3.0
4/19/2016	7.6	2.8	12	11	18	3.4	2.8
10/31/2016	1.8	3.0	10	48	22	3.1	2.5
5/3/2017	12	3.4	10	74	25	3.7	3.1
12/28/2017	5.7	3.3	7.5	29	21	3.2	2.6
4/25/2018	7.2	3.5	6.7	38	17	3.2	2.4
Trend Analysis[1]	No trend	No trend	No trend	No trend	Decreasing	Increasing	No Trend

[1]Mann-Kendall Trend Analysis, level of significance 0.05.

While the Mann-Kendall test reveals a decreasing trend in MW-5R and an increasing trend in MW-6, the trend plots provide additional information on overall trends in each well:

- MW-1 (upgradient well) – shows a slightly decreasing nitrate-N concentration trend, though the nitrate-N concentrations have been highly variable the last five sampling events (7.6 mg/L in April 2016 to 1.8 mg/L in October 2016 to 11.5 mg/L in May 2017 to 5.71 mg/L in December 2017 to 7.2 mg/L in April 2018).
- MW-2 (upgradient well) – shows a decreasing trend from 2001 through 2013 and then a slight increasing trend in recent years (though below 10 mg/L nitrate-N).
- MW-3 (side-gradient well) – shows high variability in nitrate concentrations over time. The past eight sampling events show a decreasing trend in nitrate-N concentration

(concentrations have been above 10 mg/L since 2014, but dropped below 10 mg/L in December 2017).

- MW-4 (downgradient well) – shows high nitrate-N concentration variability between sampling events. For example, in December 2012, the measured nitrate-N concentration was 79 mg/L, then dropped to a low of 4.8 mg/L in October 2013, increased to 74 mg/L in May 2017, and dropped to 28.5 mg/L in December 2017.
- MW-5R (downgradient well) – was constructed following source area removal in 2012. Nitrate-N in this well has shown a decreasing trend since 2014, though nitrate-N concentrations remain above 10 mg/L.
- MW-6 and MW-7 (downgradient and off-site wells) – show nearly identical nitrate-N concentrations and have been below 10 mg/L with an average nitrate-N concentration of 2.8 mg/L in December 2017. While nitrate concentrations in MW-7 during the April 2018 sampling event rose above 10 mg/L (15.7 mg/L), those concentrations were down to 2.4 mg/L when MW-7 was sampled again in June 2018. Therefore, the April MW-7 data is considered suspect and the June data is used in this report.

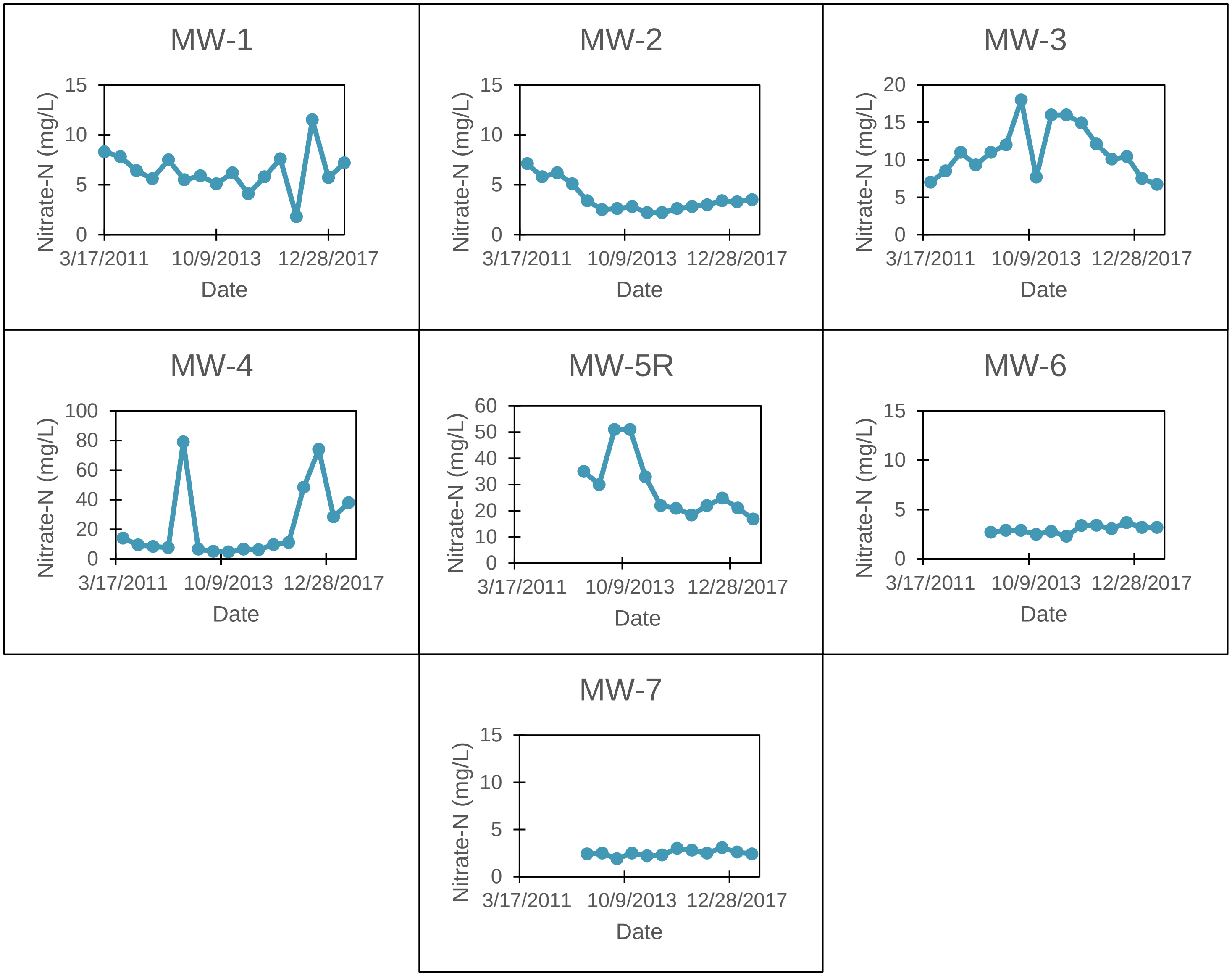


Figure 14. Trend Plots for Nitrate-N in Groundwater Monitoring Wells

4 Preliminary Screening Assessment

This section presents an initial screening of COC for soils and groundwater.

4.1 Model Toxics Control Act

The MTCA Cleanup Regulation, chapter 173-340 Washington Administrative Code (WAC), sets forth the requirements and procedures for developing soil and groundwater cleanup standards. Cleanup levels must be based on the reasonable maximum exposure expected to occur under both current and future site conditions.

4.1.1 Soil Cleanup Standards

The regulation allows for establishing soil cleanup levels based on two types of land use – unrestricted land use and industrial land use (Ecology 2005a):

- **Industrial land use** - the soil cleanup level is based on the reasonable maximum exposure expected to occur under industrial land use conditions. Industrial soil cleanup levels are based on an adult worker exposure scenario. Restrictions on the future use of the land are required if industrial soil cleanup levels are established, even if the cleanup levels are met. The regulations provide for two options for soil cleanup levels for industrial land use, Method A and Method C.
- **Unrestricted land use (residential)** - the soil cleanup level is based on the reasonable maximum exposure expected to occur under residential land use conditions. Unrestricted (residential) soil cleanup levels are based on a child exposure scenario. No restrictions on the future use of the land are needed if soil cleanup levels are met at the point of compliance. The regulations provide for two options for soil cleanup levels for unrestricted land use, Method A and Method B.

Under the MTCA regulation (WAC 173-340), when selecting a cleanup level for a chemical contaminant in soil, one criterion to consider is the potential for the contaminant to leach from soil into groundwater. Specifically, the concentrations of hazardous substances in soil should not cause contamination of groundwater that exceeds cleanup levels established under WAC 173-340-720. This pathway is considered in addition to the direct-contact criterion that is based on ingestion of soil (and dermal absorption for Modified Methods B and C evaluations).

4.1.2 Groundwater Cleanup Standards

Under the MTCA, a groundwater cleanup standard consists of a concentration (cleanup level) that must be met at a specified location within the ground water (point of compliance). It also includes any additional regulatory requirements that may be specified in applicable state or federal laws (Ecology 2005b).

For the Simplot facility and surrounding area, the shallow groundwater is considered potable (a current or future source of drinking water). The regulation requires groundwater cleanup levels to be based on the reasonable maximum exposure expected to occur under both current and future site conditions. The regulation provides three options for establishing cleanup levels for potable ground water – Method A, Method B, and Method C (Ecology 2005b). For purposes of screening of groundwater COCs, all three methods will be compared (see the document, *Focus on Developing*

Ground Water Cleanup Standards Under the Model Toxic Control Act [Ecology 2005b] for explanation of each method).

4.1.3 Ecology's Cleanup Levels and Risk Calculation

HDR used Ecology's Cleanup Levels and Risk Calculation (CLARC) resource page that contains data tables for Methods A, B, and C for both soils and groundwater. The tables were last updated in May 2019:

https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC/Data-tables

4.2 Screening of Soil Constituents

As presented in Section 3, soil samples were collected from the following events:

- 2009 GeoProbe Investigation (Section 3.1) (**Table 3-2**, **Table 3-3**, **Table 3-4**, **Table 3-5**, and **Table 3-6**). Soils analyzed for VOCs, RCRA metals, chlorinated herbicides, nitrate, and ammonia
- 2011 Groundwater Monitoring Well Installation (Section 3.2) (**Table 3-12** and **Table 3-13**). Soils analyzed for VOCs, PAH, TPH, nitrate, and ammonia.
- 2012 and 2014 Source Removal, Drain Evaluation and Additional Monitoring Well Construction (Section 3.3) (**Table 3-16**, **Table 3-17**, **Table 3-18**, and **Table 3-19**). Soils analyzed for VOCs, chlorinated herbicides, nitrate-N, and ammonia.

4.2.1 Volatile Organic Compounds (VOCs), EPA Method 8260B

VOC samples were collected from all soil sampling events described above. Soil samples with detections of VOCs and comparison to CLARC values are presented in **Table 4-1**.

The following compounds exceed CRLAC soil screening levels:

- 1,1-dichloroethane – in soil sample EB-W this sample is from the excavation pit (see **Figure 9** for sample location)
- 1,2 dichloropropane in boring B12 (both samples) from the GeoProbe study (see **Figure 4** for sample location)

For both compounds, the CRLAC exceeded was for groundwater protection.

4.2.2 RCRA Metals, EPA Method 6010B.

RCRA metals were analyzed for the GeoProbe samples only. As expected, most of the soil samples collected from the site had RCRA metals present (**Table 4-2**). The following metals exceeded the CLARC screening levels:

- Arsenic
- Cadmium

For both RCRA metals, the CLARC exceeded was for groundwater protection. The Washington state-wide arsenic concentrations is 7 mg/Kg and cadmium is 1 mg/Kg (Publication #94-115, *Natural Background Soils Metals Concentrations in Washington State*).

Table 4-1. Soil VOCs Sampling Results Compared to CLARC Screening Values

	B9	B12	B13	MW-5	EB-E	EB-W	ES-SB	ES-WB	ES-WT	**Soil** Method A Unrestricted Land Use (mg/kg)	**Soil** Method B Non cancer (mg/kg)	**Soil** Method B Cancer (mg/kg)	**Soil** Protective of Groundwater Vadose @ 13 degrees C see guidance (mg/kg)	**Soil** Method A Industrial Properties (mg/kg)	**Soil** Method C Non cancer (mg/kg)	**Soil** Method C Cancer (mg/kg)
Depth (ft)	0.3 - 2.0 3.5 - 5.0	1.0 - 2.0 3.5 - 5.5	1.0 - 2.0 2.5 - 4.5		**9 to 9.5**	**9 to 9.5**	**8 to 9**	**8 to 9**	**3 to 4**							
Benzene	0.0084 BDL	BDL BDL	0.0095 0.25	BDL	0.002	0.06	0.019	0.01	BDL							
Chlorobenzene	BDL BDL	BDL BDL	BDL	BDL	BDL	0.002	0.002	0.002	BDL							
2-Chlorotoluene	BDL BLD	BDL BDL	BDL BDL	0.010	0.005	0.01	BDL	0.004	BDL		1.60E+03				7.00E+04	
1,1-Dichloroethane	BDL BLD	BDL BDL	BDL BDL	BDL	BDL	0.01	BDL	BDL	BDL		1.60E+04	1.80E+02	4.10E-02		7.00E+05	2.30E+04
1,2-dichloropropane	BDL BLD	0.26 0.039	BDL BDL	BDL	BDL	0.003	BDL	BDL	0.003		3.20E+03	2.70E+01	2.50E-02		1.40E+05	3.50E+03
Isopropylbenzene	BDL BLD	BDL BDL	BDL BDL	BDL	BDL	0.002	BDL	BDL	BDL							
Naphthalene	BDL BLD	BDL BDL	BDL 0.045	BDL	BDL	BDL	BDL	BDL	BDL	5.00E+00	1.60E+03		4.50E+00	5.00E+00	7.00E+04	
N-Propylbenzene	BDL BLD	BDL BDL	BDL BDL	BDL	0.002	0.005	BDL	BDL	BDL		8.00E+03				3.50E+05	
1,2,4-Trimethylbenzene	BDL BDL	BDL BDL	BDL 0.065	BDL	0.008	0.034	BDL	0.002	BDL		8.00E+02				3.50E+04	
1,2,3-Trimethylbenzene	BDL BDL	BDL BDL	0.017 0.052	BDL	0.003	0.011	BDL	BDL	BDL		8.00E+02				3.50E+04	
1,3,5-Trimethylbenzene	BDL BDL	BDL BDL	0.014 0.040	BDL	0.005	0.014	BDL	BDL	BDL		8.00E+02				3.50E+04	
Xylenes, Total	BDL BDL	BDL BDL	0.033 0.18	BDL	BDL	BDL	BDL	BDL	BDL	9.00E+00	1.60E+04		1.40E+01	9.00E+00	7.00E+05	

BDL = below detection limit; ft = feet; mg/kg = milligrams per kilogram; Shaded cell represents constituent exceeding the screening level.

Table 4-2. Soil RCRA Metals Results Compared to CLARC Screening Values

	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	Soil Method A Unrestricted Land Use	Soil Method B Non cancer	Soil Method B Cancer	Soil Protective of Groundwater Vadose	Soil Method A Industrial Properties	Soil Method C Non cancer	Soil Method C Cancer
Depth (ft)	3.0 - 5.0	0.3 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 2.0	0.0 - 1.5	0.0 - 1.5	0.0 - 1.5	0.3 - 2.0	1.5 - 3.5	0.3 - 2.0	1.0 - 2.0	1.0 - 2.0							
	5.0 - 7.0	2.0 - 4.0	3.0 - 5.0	3.5 - 5.5	3.0 - 5.0	3.0 - 5.0	3.5 - 4.5	2.8 - 4.0	3.5 - 5.0	4.0 - 6.0	3.0 - 4.5	3.5 - 5.5	2.5 - 4.5							
RCRA 8 Metals - EPA Method 6010B (mg/kg)														**(mg/Kg)**						
Mercury	0.072	BDL	0.036	BDL	BDL	BDL	BDL	BDL	BDL	0.036	BDL	0.055	0.024	2.00E+00			2.10E+00	2.00E+00		
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL							
Arsenic	BDL	BDL	BDL	BDL	BDL	BDL	BDL	**3.2**	**5.6**	**1.9**	**3.2**	**3.5**	BDL	2.00E+01	2.40E+01	6.70E-01	2.90E+00	2.00E+01	1.10E+03	8.80E+01
	BDL	BDL	BDL	BDL	BDL	BDL	**7.0**	**5.8**	**6.9**	**7.9**	**6.2**	BDL	BDL							
Barium	110	180	210	180	190	190	140	180	180	140	170	170	160		1.60E+04		1.60E+03		7.00E+05	
	180	200	210	250	300	240	210	160	210	190	210	220	210							
Cadmium	**7.1**	**3.6**	**3.1**	**1.2**	**1.2**	**1.3**	**1.2**	**1.7**	**1.6**	**3.0**	**2.2**	**1.7**	**1.2**	2.00E+00	8.00E+01		6.90E-01	2.00E+00	3.50E+03	
	5.2	**3.3**	**1.4**	**1.6**	**1.4**	**1.6**	**1.4**	**1.1**	**1.6**	**1.8**	**1.3**	0.44	0.40							
Chromium	37	25	24	21	24	24	18	22	25	54	22	22	27	2.00E+03	1.20E+05		4.80E+05	2.00E+03	5.30E+06	
	29	27	26	29	26	28	25	21	27	27	26	32	33							
Lead	77	47	44	16	12	12	19	110	4.3	40	17	38	40	2.50E+02			3.00E+03	1.00E+03		
	27	27	12	14	12	13	4.9	3.8	3.5	2.4	4.7	14	15							
Selenium	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL		4.00E+02		5.20E+00		1.80E+04	
	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL							
Silver	BDL	BDL	BDL	BDL	BDL	BDL	BDL	0.84	0.98	BDL	0.66	0.65	BDL		4.00E+02		1.40E+01		1.80E+04	
	BDL	BDL	BDL	BDL	BDL	BDL	0.98	0.81	1.1	1.0	BDL	BDL	BDL							

Resource Conservation and Recovery Act (RCRA) metals ran for the GeoProbe Investigation (HDR 2009b).
BDL = below detection limit; ft = feet; mg/kg = milligrams per kilogram

4.2.3 Soil Chlorinated Herbicide, EPA Method 8151

Chlorinated herbicides were analyzed in the 2009 GeoProbe Investigation and for soils remaining after rinse pit excavation (source removal) (see **Table 3-5** and **Table 3-19** summary of results). The only detected herbicides was in the GeoProbe boring B13, where 2,4-D and Dicamba (**Table 4-3**). The CLARC for both herbicides is several orders of magnitude greater than the detected soil concentrations.

Table 4-3. Soil Herbicide Results Compared to CLARC Screening Values

Herbicide EPA Method 8151	Sample ID B13 (2.5 to 4.5 ft)	Soil Method A Unrestricted Land Use	Soil Method B Non cancer	Soil Method B Cancer	Soil Protective of Groundwater Vadose	Soil Method A Industrial Properties	Soil Method C Non cancer	Soil Method C Cancer
(mg/Kg)								
2,4-D	0.20		8.0E+02				3.5E+04	
Dicamba	0.13		2.4E+03				1.1E+05	

See **Table 3-5** and **Table 3-19** for full listing of samples analyzed for herbicides.
mg/kg = milligrams per kilogram; ft = feet

4.2.4 PAHs and TPH, EPA Methods 8260B and NWTPHGX and NWTPHDX

PAHs were run on soil samples collected from well borings MW-1 through MW-5. PAHs were non-detected for all soil samples. TPH was analyzed for samples collected the soil samples from well borings MW-1 through MW-5 (5 soil samples). Soils from MW-5 had detected concentrations of diesel range organic (NWTPHDX):

- Diesel range organics 11 mg/Kg the CLARC is 2,000 mg/Kg

4.3 Groundwater Data Screening

Section 3.4 summarizes groundwater monitoring events and results from the initial GeoProbe investigation activities through 2018 sampling. **Table 3-25** provides a summary of detected compounds.

Appendix D presents a series of spreadsheets used to screen out and identify COCs in groundwater. Spreadsheets are presented are the following screening steps:

- Step 1. List all compounds analyzed in groundwater including laboratory reported constituents for inorganics (chloride, sulfate, nitrate, and ammonia), RCRA metals, VOCs, chloride herbicides, TPH and PAHs. Next, identify those constituents that had a least one detection.
- Step 2. Screen (remove) compounds that no detections.
- Step 3. Screen out compounds that were non-detected in the last 8 sampling event for the compound. If less than 8 sampling events, use all the data.
- Step 4. Compare the remaining compounds to the CLARC values and identify those compounds that exceed the screening values.

The results of the screening show the following compounds as exceeding the CLARC screening levels in at least one sample in groundwater (see Step 4 in Appendix D for comparison of identified COC to the CLARC values):

- Nitrate-N
- Arsenic
- Lead
- 1,2 Dichloroethane
- 1,2-Dichloropropane

Table 4-4 summarizes detection of these compounds. The exception to this screening is Well MW-5, which was located adjacent to the rinsate area. This well was removed and the soils in the area were excavated as part of the remedial action for the rinsate area. Results for MW-5 are summarized in **Table 3-25**. Well MW-5 was replaced by MW-5R (see **Table 3-25** and **Table 4-4** for summary of water quality for this well).

Table 4-4. Summary of COC exceeding the CLARC Screening Levels in Groundwater

Detected Compounds (mg/L)	3/17/2011	6/30/2011	9/15/2011	12/16/2011	12/5/2012	4/4/2013	7/24/2013	10/9/2013	10/28/2014	4/29/2015	10/14/2015	4/19/2016	10/31/2016	5/3/2017	12/28/2017	4/25/2018	9/11/2018	CLARC[1] (mg/L)
MW-1																		
Nitrate-Nitrite	8.3	7.8	6.4	5.6	7.5	5.5	5.9	5.1	6.2	4.1	5.78	7.6	1.8	11.5	5.71	7.2	6.2	10
Arsenic	<0.020	0.049	0.038	0.036	0.034	0.037	<0.020	0.040	0.043	0.03	0.0478	0.0418	0.0423	0.0402	0.0473	0.0861	0.0396	0.01
Lead	0.011	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.020	<0.020	<0.020	0.00455	<0.020	<0.020	<0.0050	<0.00500	0.0438	0.0033	0.015
1,2-Dichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005
1,2-Dichloropropane	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005
MW-2																		
Nitrate-Nitrite	7.1	5.8	6.2	5.1	3.4	2.5	2.6	2.8	2.2	2.2	2.6	2.81	2.98	3.4	3.28	3.5	3.3	10
Arsenic	0.058	0.081	0.11	0.083	0.06	0.067	0.029	0.064	0.06	0.047	0.053	0.0505	0.0551	0.0543	0.0618	0.0659	0.0722	0.01
Lead	NA	NA	NA	NA	<0.0050	<0.0050	<0.0050	<0.020	<0.020	<0.020	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0062	0.0061	0.015
1,2-Dichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005
1,2-Dichloropropane	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005
MW-3																		
Nitrate-Nitrite	7	8.5	11	9.3	11	12	18	7.7	16	16	14.9	12.1	10.1	10.4	7.49	6.7	6.6	10
Arsenic	0.027	0.062	0.038	0.062	0.036	0.05	<0.020	0.039	0.046	0.026	0.0554	0.0521	0.052	0.0598	0.057	0.0916	0.0505	0.01
Lead	0.027	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.016	<0.0050	<0.0050	<0.0050	<0.0050	0.0356	0.00073	0.015
1,2-Dichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005
1,2-Dichloropropane	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005
MW-4																		
Nitrate-Nitrite	14	9.6	8.4	7.8	79	6.7	5.1	4.8	6.6	6.2	9.66	11.1	123 (48.4)[2]	74	28.5	38	31.8	10
Arsenic	<0.020	0.04	0.028	0.031	0.024	0.024	<0.020	0.027	0.032	0.017	0.0302	0.0251	0.0356	0.0315	0.0273	0.0477	0.0324	0.01
Lead	0.012	<0.0050	0.0062	<0.0050	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.00541	<0.0050	<0.0050	<0.0050	<0.0050	0.0234	0.0092	0.015
1,2-Dichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005
1,2-Dichloropropane	0.014	0.016	0.0056	0.004	0.065	0.0054	0.005	0.0046	0.0063	0.0063	0.00689	0.00752	0.0603	0.0492	0.0428	0.0686	0.0649	0.005
MW-5R																		
Nitrate-Nitrite					35	30	51	51	33	22	21	18.4	22	24.8	21.1	16.8	15.3	10
Arsenic					0.05	0.066	0.027	0.064	0.081	0.068	0.0869	0.0781	0.0809	0.0759	0.0783	0.0956	0.0632	0.01
Lead					<0.0050	<0.0050	0.0053	<0.0050	<0.0050	<0.0050	0.0128	<0.0050	<0.0050	<0.0050	0.00773	0.0212	0.0118	0.015
1,2-Dichloroethane					0.0051	0.0045	0.004	0.0056	0.0044	0.0031	0.0028	0.0028	0.003	0.00374	0.00248	0.0032	0.0019	0.005
1,2-Dichloropropane					<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005
MW-6																		
Nitrate-Nitrite					2.7	2.9	2.9	2.5	2.8	2.3	3.4	3.42	3.07	3.7	3.19	3.2	3	10
Arsenic					<0.020	<0.020	<0.020	<0.020	0.023	0.0088	0.0208	0.0158	0.0197	0.017	0.0162	0.0295	0.0154	0.01
Lead					<0.0050	<0.0050	0.0064	<0.0050	<0.0050	0.0028	0.0117	<0.0050	<0.0050	<0.0050	<0.0050	0.0179	0.053	0.015
1,2-Dichloroethane					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005
1,2-Dichloropropane					<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005

Table 4-4. Summary of COC exceeding the CLARC Screening Levels in Groundwater

Detected Compounds (mg/L)	3/17/2011	6/30/2011	9/15/2011	12/16/2011	12/5/2012	4/4/2013	7/24/2013	10/9/2013	10/28/2014	4/29/2015	10/14/2015	4/19/2016	10/31/2016	5/3/2017	12/28/2017	4/25/2018	9/11/2018	CLARC[1] (mg/L)
MW-7																		
Nitrate-Nitrite					2.4	2.5	1.9	2.5	2.2	2.3	2.97	2.81	2.5	3.06	2.62	15.7 (2.4)[2]	2.3	10
Arsenic					<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.0137	0.0136	0.0103	0.012	0.0141	0.0618 (0.0098)	0.0201	0.01
Lead					<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0074	0.0074	<0.0050	<0.0050	<0.0050	<0.0050	0.0531 (0.00015)	0.0156	0.015
1,2-Dichloroethane					<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005
1,2-Dichloropropane					<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.005

1 Based on Washington State Maximum Contaminant Level. Shaded cells represent samples exceeding the CLARC.

2 MW-7 was resampled in June 2018 in response to the high nitrate-N concentration detected in April 2018. The resample showed nitrate below the CLARC, also the lead and arsenic resamples were lower.

mg/L = milligrams per liter

4.4 Preliminary Conceptual Site Model

4.4.1 Type and Source of Contaminants

For soils, the prevalent COC are nitrate-N and ammonia-N. The compounds 1,1-dichloroethane and 1,2-dichloropropane were identified in two samples but are not widespread (**Table 4-1**). The compound 1,1-dichloroethane has not been detected in groundwater; however, 1,2-dichloropropane has been detected in well MW-4. Arsenic and cadmium are in the range of soil background concentrations for Washington.

For groundwater, the main COC is nitrate-N. Arsenic and lead appear to be at ambient levels in (occur on both up and downgradient wells). The VOC 1,2-dichloropropane is persistent in MW-4 but not in other wells and has not been detected in off-site downgradient wells. The VOC 1,2-dichloroethane has been in MW-5R but has been below method detection limits in the last eight sampling events.

4.4.2 Transport and/or Migration Pathways

Transport and/or migration pathways define those mechanisms by which humans are exposed to a chemical released from a site. A pathway is comprised of four elements:

- A source and mechanism for release of a chemical into the environment
- A transport medium (e.g., soil, air, and water)
- A point of potential human contact (exposure point)
- A human exposure route (ingestion, inhalation, dermal contact)

A conceptual site model for the Simplot facility will be developed as part of the RI/FS. As described in Section 3, a primary source of potential COCs was the rinsate area, where Simplot conducted a source removal in 2012. Other potential sources may remain and will be further investigated as part of the RI/FS.

As described in sections 2 and 3, the rinsate area was identified as potential primary source (release) area and soils have been excavated from this area. In addition, Simplot replaced its fertilizer tank storage area (aboveground storage tanks and secondary containment system) in 2011 (see **Figure 2** and **Figure 3** for aerial photograph of site layout before and after the 2011 installation of the new tank storage area).

To date, off-site groundwater sampling (MW-6 and MW-7) have not shown COCs above CLARC values (VOCs have been non-detect and nitrate levels below 10 mg/L).

4.4.3 Terrestrial Ecological Evaluation

Per WAC 173-340-7490, a terrestrial ecological evaluation (TEE) is used to determine “whether a release of hazardous substances to soil presents a threat to the terrestrial environment,” to characterize “existing or potential threats to terrestrial plants or animals exposed to hazardous substances in soil,” and aid in establishing “site-specific cleanup standards for the protection of terrestrial plants and animals.” A TEE must be conducted at all sites where a release of a hazardous substance to soil has occurred. As COCs identified above has been released to the soil, this regulation applies to the site, and an exclusion, a simplified TEE, or a site-specific TEE is required. This evaluation will be completed as part of the RI/FS.

5 References

DNR [Washington State Department of Natural Resources]. 2019. Geologic Provinces: Columbia Basin. https://www.dnr.wa.gov/programs-and-services/geology/explore-popular-geology/geologic-provinces-washington/columbia-basin#.3. Accessed August 8, 2019.

Ecology [Washington State Department of Ecology].

2005a. Focus on Developing Soil Cleanup Standards Under the Model Toxics Control Act. 01-09-071. Revised April 2005.

2005b. Focus on Developing Ground Water Cleanup Standards Under the Model Toxic Control Act. 01-09-049, Revised April 2005

1994. Natural Background Soil Metals Concentrations in Washington State. Publication #94-115. October 1994.

Freeze, R. A. and J.A. Cherry. 1979. Groundwater. Prentice Hall. Inc.

HDR [HDR Engineering, Inc.]

2018a. Monitoring Well Sampling Update. Simplot Grower Solutions. January 2018.

2018b. Monitoring Well Sampling Update. Simplot Grower Solutions. June 2018.

2017a. Monitoring Well Sampling Update. Simplot Grower Solutions. January 2017

2017b. Monitoring Well Sampling Update. Simplot Grower Solutions. July 2017.

2016. Monitoring Well Sampling Update. Simplot Grower Solutions. June 2016.

2015a. Monitoring Well Sampling Update. Simplot Growers Solutions. February 4, 2015.

2015b. Monitoring Well Sampling Update. Simplot Grower Solutions. July 2015.

2015c. Monitoring Well Sampling Update. Simplot Grower Solutions. November 2015.

2013a. Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Report. February 2013.

2013b. Supplemental Drain Evaluation and Monitoring Well Sampling Report. September 2013.

2012a. Source Removal, Drain Evaluation, Monitoring Well Construction, and Sampling Work Plan. July 2012.

2012b. Modification to Source Removal and Additional Investigation Work Plan, July 2012. Letter to Ecology November 20, 2012.

2012c. 2011 Monitoring Well Sampling Report. May 2012.

2011. Monitoring Well Construction and Sampling Report. April 2011.

2010. Monitoring Well Construction and Sampling Work Plan. July 2010. Revised December 2010.

2009a. Preliminary Site Investigation Work Plan. May 2009.

2009b. Preliminary Site Investigation Report. December 2009.

2009c. Quality Assurance Project Plan. December 2009.

Marsh-McBirney. 1994. *Open Channel Profiling Handbook*.

Secor

2007. Phase III Remedial Investigation for the Bee-Jay Scales Site.

2006. Phase III Remedial Investigation Work Plan for the Bee-Jay Scales Site. February 10, 2006.

Stantec [Stantec Consulting Corporation]

2012. Storm Drain Assessment Results for the Bee-Jay Scales Site. July 17, 2012.

2011. Second Half 2011 Semi-Annual Groundwater Monitoring and Sampling Report. November 14, 2011.

2009. Revised Feasibility Study Report. Bee-Jay Scales Site. October 16, 2009.

2008. Third Quarter 2008 Groundwater Monitoring and Sampling Report. November 7 2008.

Vaccarro, J.J., Jones, M.A., Ely, D.M., Keys, M.E., Olsen, T.D., Welch, W.B., and Cox, S.E., 2009. Hydrogeologic Framework of the Yakima River Basin Aquifer System, Washington. U.S. Geological Survey Scientific Investigation Report 2009-5152.

A

Historic Aerial Site Photographs

Simplot Grower Solutions
300 S. 1st St
Sunnyside, WA 98944

Inquiry Number: 2455472.5
April 02, 2009

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDRs professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:
Aerial Photography April 02, 2009

Target Property:
300 S. 1st St
Sunnyside, WA 98944

Year	***Scale***	***Details***	***Source***
1973	Aerial Photograph. Scale: 1"=500'	Panel #: 2446120-C1/Flight Date: July 01, 1973	EDR
1982	Aerial Photograph. Scale: 1"=1000'	Panel #: 2446120-C1/Flight Date: August 17, 1982	EDR
1990	Aerial Photograph. Scale: 1"=1000'	Panel #: 2446120-C1/Flight Date: June 20, 1990	EDR
1996	Aerial Photograph. Scale: 1"=750'	Panel #: 2446120-C1/Flight Date: June 29, 1996	EDR
2006	Aerial Photograph. Scale: 1"=535'	Flight Year: 2006	EDR


INQUIRY #: 2455472.5
YEAR: 1973
= 500'
N
EDR Environmental Data Resources Inc


INQUIRY #: 2455472.5
YEAR: 1982
= 1000'
N

INQUIRY #: 2455472.5

YEAR: 1990

= 1000'

N

EDR Environmental Data Resources Inc

INQUIRY #: 2455472.5
YEAR: 1996
= 750'
N
EDR Environmental Data Resources Inc


INQUIRY #: 2455472.5
YEAR: 2006
= 535'
N
EDR Environmental Data Resources Inc

B

GeoProbe Boring Logs and Monitoring Wells Logs

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B1**	SHEET 1 of 1
	SOIL BORING LOG		

PROJECT : Simplot Grower Solutions, Sunnyside, WA — LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : — DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner — BOREHOLE DEPTH : 12 ft

WATER LEVEL: — START: 9/24/09 — END: 9/24/09 — LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-3.0			Run 1 0.0 to 4.0 Rec. = 2.0/4.0	0.0 to 3.0 GRAVEL - Drain field	Start Time 1315 Soil samples: B1-SU @ 1330 (3.0 to 5.0 ft) B1-WT @1345 (5.0 to 7.0 ft)
	3.0-12.0			Run 2 4.0 to 8.0 Rec. = 3.0/4.0	3.0 TO 12.0 CLAYEY SILT (ML) dk. brown, color change to gray 11.5 to 12.0 ft. dry to 3.0 ft, sl. moist 3.0 to 4.0 ft, wet 4.0 to 11.5 ft. sl. moist & harder 11.5 to 12.0 ft.	Water sample: B1-GW @ 1400 (Screen 9.9 to 12.0 ft) B14-GW @1630 Duplicate Sample Groundwater reacts to acid in VOA vials Slight fertilizer odor, no staining.
5						
				Run 3 8.0 to 12.0 Rec. = 3.0/4.0		
10						
					TD 12.0 ft.	Hard to Geoprobe, near refusal.
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B2**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner BOREHOLE DEPTH : 11.2 ft

WATER LEVEL: START: 9/24/09 END: 9/24/09 LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-0.3			Run 1	0.0 to 0.3 FILL	Start Time 1215
	0.5-11.2			0.0 to 4.0	0.3 TO 11.2 CLAYEY SILT (ML)	
					brown to 9.0 ft, color change to lt. gray 9.0 to 11.2ft.	Soil samples: B2-SU @ 1230 (0.3 to 2.0 ft) B2-WT @1245 (2.0 to 4.0 ft)
					dry 0.3 to 2.0 ft, sl. moist 2.0 to 4.0 ft, wet 4.0 to 9.5 ft, sl. moist 9.5 to 11.2 ft.	
				Run 1 4.0 to 8.0		Water sample: B2-GW @ 1300 (Screen 8.2 to 11.2 ft)
5						Water cleared up
						No odor and no staining.
				Run 1 8.0 to 12.0		
10						
					TD 11.2 ft.	Hard to Geoprobe, near refusal. Driller does not want to jam core
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B3**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner BOREHOLE DEPTH : 12 ft

WATER LEVEL: START: 9/23/09 END: 9/23/09 LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-12.0			Run 1 0.0 to 4.0	<u>0.0 to 12.0 CLAYEY SILT (ML)</u> dk. brown to brown to 11.5 ft, lt. gray to 12.0 ft. dry to 2.0 ft, sl. moist to 5.0 ft, wet from 5.0 to 12.0 ft. some gravel from 0.0 to 1.0 ft, loose from 0.0 to 2.0 ft.	Start Time 1500 Soil samples: B3-SU @ 1515 (0.0 to 2.0 ft) B3-WT @1530 (3.0 to 5.0 ft) Water sample: B3-GW @ 1545 (Screen 9 to 12 ft) No odor, no staining Pumped dry 3 times
5				Run 2 4.0 to 8.0		
				Run 3 8.0 to 12.0		
10						
					TD12.0 ft.	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B4**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA — LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : — DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner — BOREHOLE DEPTH : 12 ft

WATER LEVEL: — START: 9/23/09 — END: 9/23/09 — LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-12.0			Run 1 0.0 to 4.0	<u>0.0 to 12.0 CLAYEY SILT (ML)</u> dk. brown to brown, dry to sl. moist to 5.0 ft, wet from 5.0 to 12.0 ft.	Start Time 1400 Soil samples: B4-SU @ 1415 (0.0 to 2.0 ft) B4-WT @1430 (3.5 to 5.5 ft) Water sample: B4-GW @ 1445 (Screen 9 to 12 ft) No odor, no staining. Water dirty - did not clear up
				Run 2 4.0 to 8.0		
5						
				Run 3 8.0 to 12.0		
10						
					TD 12.0 ft.	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B5**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA   LOCATION : 300 1st Str., Sunnyside, WA
G.S. ELEVATION :   DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA
DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner   BOREHOLE DEPTH : 12 ft
WATER LEVEL: START: 9/23/09   END: 9/23/09   LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0.6			Run 1 0.0 to 4.0	0.0 to 0.6 Fill	Start Time 1245
	0.6-12.0				0.6 to 12.0 CLAYEY SILT (ML) dk. brown, sl. moist, wet from 2.5 to 12.0 ft.	Soil samples: B5-SU @ 1310 (0.0 to 2.0 ft) B5-WT @1320 (3.0 to 5.0 ft)
				Run 2 4.0 to 8.0		Water sample: B5-GW @ 1330 (Screen 9 to 12 ft)
5						No odor, no staining Pumped dry, let set Water dirty - did not clear up
				Run 3 8.0 to 12.0		
10						
					TD 12.0 ft.	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B6**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner BOREHOLE DEPTH : 12 ft

WATER LEVEL: START: 9/23/09 END: 9/23/09 LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-3.5			Run 1 0.0 to 4.0	0.0 to 12.0 CLAYEY SILT (ML) brown to 10.5 ft, color change to gray to dk. gray to 12.0 ft. sl. moist, compact, some sand, less compact and wet 3.5 to 12.0 ft.	Start Time 1145 Soil samples: B6-SU @ 1200 (0.0 to 1.5 ft) B6-WT @1215 (3.0 to 5.0 ft)
	3.5-10.5			Run 2 4.0 to 8.0		Water sample: B6-GW @ 1230 (Screen 9 to 12 ft) No odor, no staining.
5						
				Run 3 8.0 to 12.0		
10						
	10.5-12.0					
					TD 12.0 ft.	
15						
20						

HDR, Inc.

SITE Simplot Grower Solutions	**BORING NUMBER** B7 — SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA — LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : — DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner — BOREHOLE DEPTH : 10 ft

WATER LEVEL: — START: 9/23/09 — END: 9/23/09 — LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-1.5			Run 1 0.0 to 4.0	0.0 to 1.5 SAND & GRAVEL - FILL? tan to lt. brown,fine to medium, dry	Start Time 1000
	1.5-10.0				1.5 to 10.0 CLAYEY SILT (ML) some sand brown, color change to lt. gray to gray 8.0 to 10.0 ft., dry to 1.5 ft, sl. moist to 4.0 ft, wet to 8.0 ft.	Soil samples: B7-SU @ 1015 (0.0 to 1.5 ft) B7-WT @1030 (3.5 to 4.5 ft) Water sample:
				Run 2 4.0 to 8.0	moist to 10.0 ft.	B7-GW @ 1100 (Screen 7 to 10 ft)
5						making little water, only filled 1-L No odor, no staining Pumped dry 3 times Only filled one of the liter bottles.
				Run 3 8.0 to 10.0		
10					TD 10.0 ft.	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B8**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA — LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : — DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner — BOREHOLE DEPTH : 12 ft

WATER LEVEL: — START: 9/23/09 — END: 9/23/09 — LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-1.0			Run 1 0.0 to 4.0	0.0 to 1.0 SILTY SAND (SM) lt. brown to tan, dry, loose.	Start Time 0800
	1.0-5.0				1.0 to 5.0 CLAYEY SILT (ML) dk. brown, sl. moist, moist form 2.8 to 5.0	Soil samples: B8-SU @ 0830 (0.0 to 1.5 ft) B8-WT @0845 (2.8 to 4.0 ft)
				Run 2 4.0 to 8.0		Water sample: B8-GW @ 0915 (Screen 8 to 11 ft)
5	5.0-7.5				5.0 to 7.5 SILTY SAND (SM) dk. brown, wet.	No odor, no staining. Pumped dry 3 times
	7.5-12.0			Run 3 8.0 to 12.0	7.5 to 12.0 CLAYEY SILT (ML) dk. brown, wet, color change to gray from 10.0 to 11.5, colr back to dk. brown 11.5 to 12.0 ft.	
10						
					TD 12.0 ft	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B9**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA — LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : — DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner — BOREHOLE DEPTH : 13 ft

WATER LEVEL: — START: 9/24/09 — END: 9/24/09 — LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-0.3			Run 1	0.0 to 0.3 FILL	Start Time 0800
	0.3-13.0			0.0 to 4.0	0.3 TO 13.0 CLAYEY SILT (ML)	
					dk. brown to brown, color change to gray 9.0 to 13.0 ft.	Soil samples: B9-SU @ 0815 (0.3 to 2.0 ft) B9-WT @0830 (3.5 to 5.0 ft)
					sl. moist from 0.3 to 4.0 ft, wet from 4.0 to 13.0 ft.	
				Run 2 4.0 to 8.0		Water sample: B9-GW @ 0845 (Screen 10 to 13 ft)
5						Groundwater dirty, does not clear up. Only fill one of the liter samples bottles. Core has fertilizer odor but no staining.
				Run 3 8.0 to 12.0		
10						
				Run 4 12.0 to 13.0	TD 13.0 ft.	Hard to Geoprobe. Driller reports refusal at 13.0, does not want to jam liner.
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B10**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner BOREHOLE DEPTH : 12 ft

WATER LEVEL: START: 9/24/09 END: 9/24/09 LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-2.0			Run 1 0.0 to 4.0	0.0 to 2.0 Fill - some yellow product	Start Time 1500
	2.0-12.0				2.0 TO 12.0 CLAYEY SILT (ML) brown to dk. brown, color change to gray 9.5 to 12.0 ft. dry to 2.0 ft, moist 2.0 to 4.0 ft, wet 4.0 to 11.0 ft. sl. moist 11.0 to 12.0 ft. No distinct odor, no staining.	Soil samples: B10-SU @ 1515 (1.5 to 3.5 ft) B10-WT @1530 (4.0 to 6.0 ft) Water sample: B10-GW @ 1545 (Screen 9.0 to 12.0 ft) Produces very little water. Only filled two VOA vials in 30 minutes B14-WT @ 1615 Replicate soil sample at 4.0 to 6.0 ft.
				Run 2 4.0 to 8.0		
5						
				Run 3 8.0 to 12.0		
10						
					TD 12.0 ft.	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B11**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA   LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION :   DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner   BOREHOLE DEPTH : 12 ft

WATER LEVEL: START: 9/23/09   END: 9/23/09   LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS TIME AND MISCELLANEOUS COMMENTS
	0.0-0.3			Run 1	0.0 to 0.3 FILL	Start Time 1600
	0.3-12.0			0.0 to 4.0	0.3 TO 12.0 CLAYEY SILT (ML)	
					dk. brown to brown, color change to gray 11.5 to 12.0 ft.	Soil samples: B11-SU @ 1615 (0.3 to 2.0 ft) B11-WT @1630 (3.0 to 4.5 ft)
					sl. moist from 0.3 to 4.5 ft, wet from 4.5 to 12.0 ft.	
					white flakes in upper two feet of core	Water sample:
				Run 2 4.0 to 8.0		B11-GW @ 1645 (Screen 9 to 12 ft)
5						Core has fertilizer odor but no staining.
				Run 3 8.0 to 12.0		
10						
					TD 12.0 ft.	
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B12**	SHEET 1 of 1

SOIL BORING LOG

PROJECT : Simplot Grower Solutions, Sunnyside, WA   LOCATION : 300 1st Str., Sunnyside, WA
G.S. ELEVATION :   DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA
DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner   BOREHOLE DEPTH : 11.5 ft
WATER LEVEL: START: 9/24/09   END: 9/24/09   LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-0.5			Run 1	0.0 to 0.5 FILL	Start Time 1115
	0.5-11.5			0.0 to 4.0	0.3 TO 11.5 CLAYEY SILT (ML), some gravel to 1.0 ft.	Soil samples:
					dk. brown to brown, some white flakes upper two feet.	B12-SU @ 1130 (1.0 to 2.0 ft) B12-WT @1145 (3.5 to 5.5 ft)
					sl. moist from 0.5 to 5.5 ft, wet from 5.5 to 11.5 ft.	Water sample:
				Run 2 4.0 to 8.0		B12-GW @ 1200 (Screen 8.5 to 11.5 ft)
5						Core has odor but no staining.
				Run 3 8.0 to 11.5		
10						
					TD 11.5 ft.	Hard to Geoprobe, near refusal. Driller does not want to jam core barrel.
15						
20						

HDR, Inc.	SITE **Simplot Grower Solutions**	BORING NUMBER **B13**	SHEET 1 of 1
	SOIL BORING LOG		

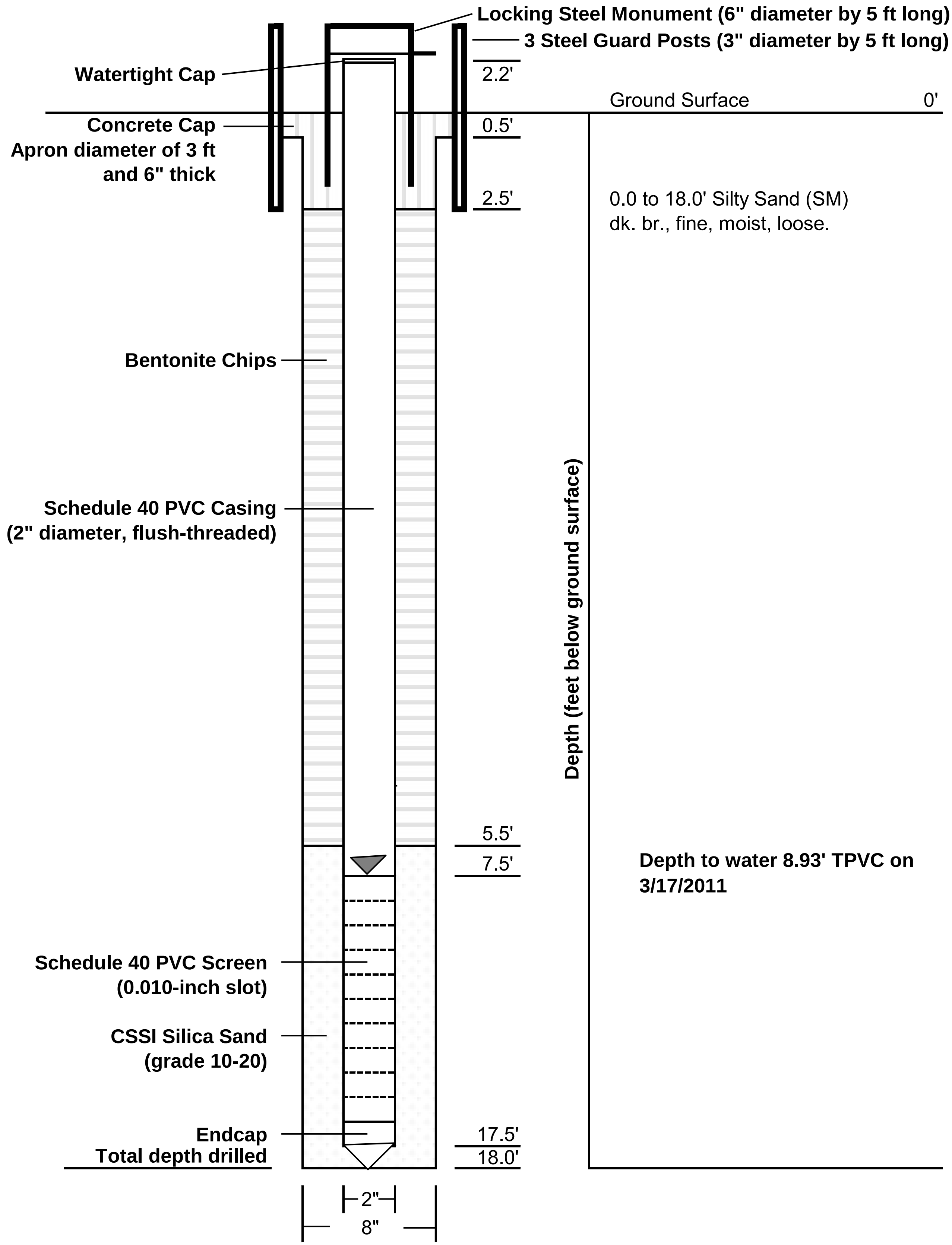
PROJECT : Simplot Grower Solutions, Sunnyside, WA LOCATION : 300 1st Str., Sunnyside, WA

G.S. ELEVATION : DRILLING CONTRACTOR : Environmental West, Inc. Spokane WA

DRILLING METHOD USED : Geoprobe 5400 with 2-inch macrocore barrel & liner BOREHOLE DEPTH : 12 ft

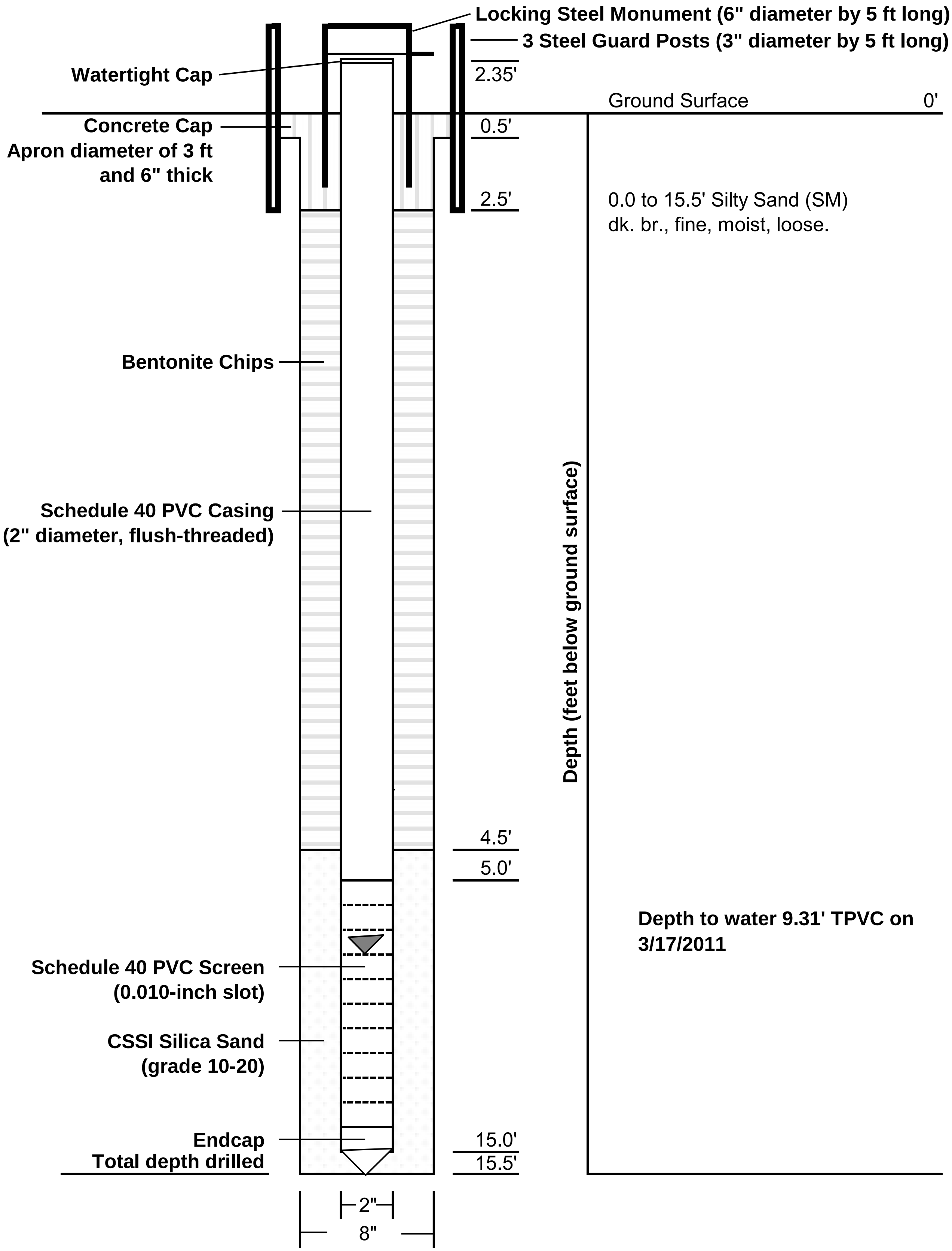
WATER LEVEL: START: 9/24/09 END: 9/24/09 LOGGER : D. Reynolds (HDR)

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6"	CORE DESCRIPTION: SOIL NAME, USCS SYMBOL, COLOR, MOISTURE CONTENT, CONSISTENCY OR DENSITY, SOIL STRUCTURE	COMMENTS: TIME AND MISCELLANEOUS COMMENTS
	0.0-0.5			Run 1	0.0 to 0.5 FILL	Start Time 1000
	0.5-12.0			0.0 to 4.0	0.5 TO 12.0 CLAYEY SILT (ML)	
					dk. brown to brown, color change gray to dk. gray 11.5 to 12.0 ft, sl. moist from 0.3 to 4.0 ft, wet from 4.0 to 11.5 ft, moist 11.5 to 12.0 ft.	Soil samples: B13-SU @ 1015 (1.0 to 2.0 ft) B13-WT @1030 (2.5 to 4.5 ft)
				Run 2 4.0 to 8.0		Water sample: B13-GW @ 1045 (Screen 9 to 12 ft)
5						Core has fertilizer odor.
				Run 3 8.0 to 12.0		
10						
					TD 12.0 ft.	
15						
20						



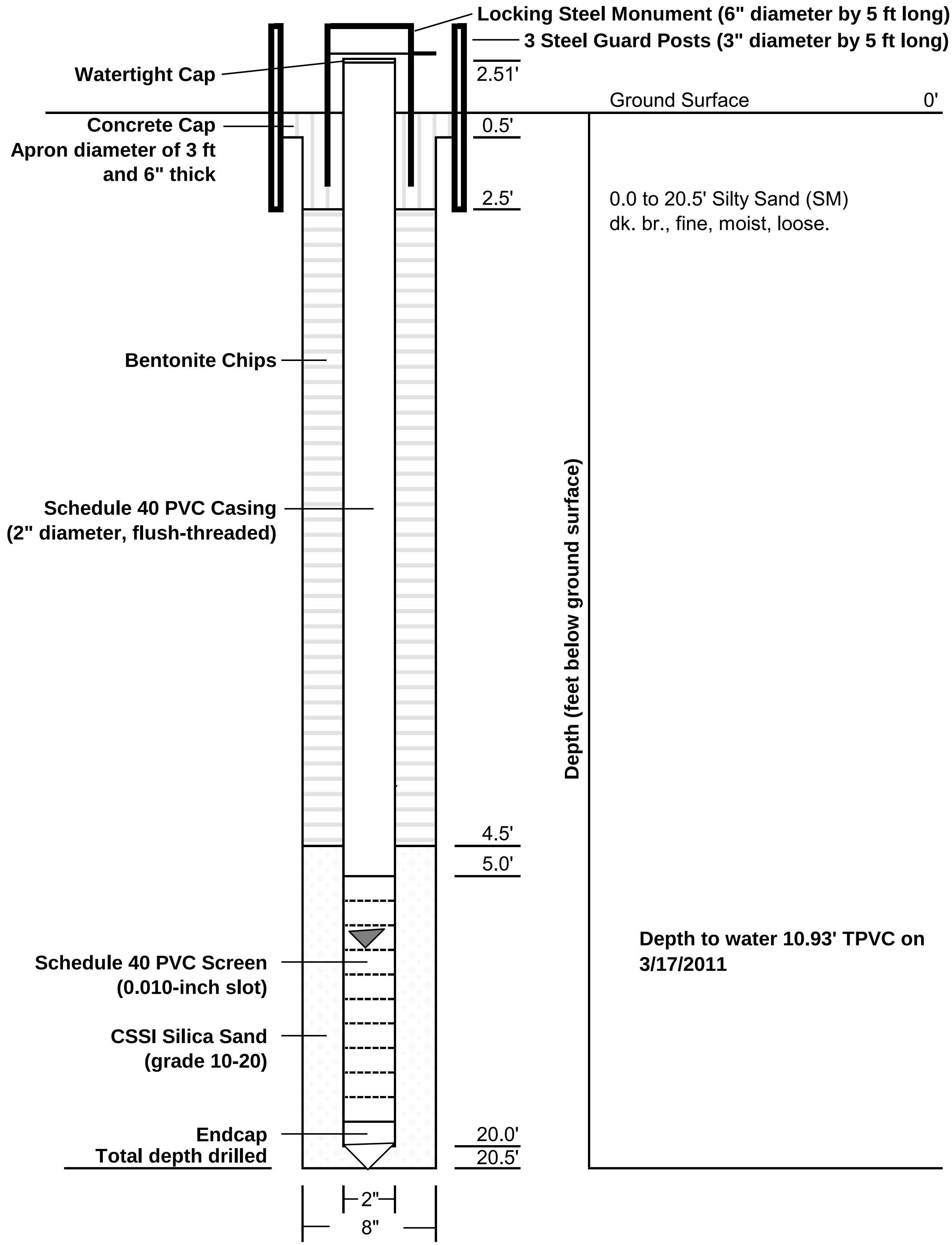
DRAWING NOT TO SCALE
Well Tag BCL 309
Installed March 15, 2011

Figure 1
Monitoring Well Construction Diagram
For Monitoring Well MW-1
Simplot Grower Solutions
Sunnyside Washington



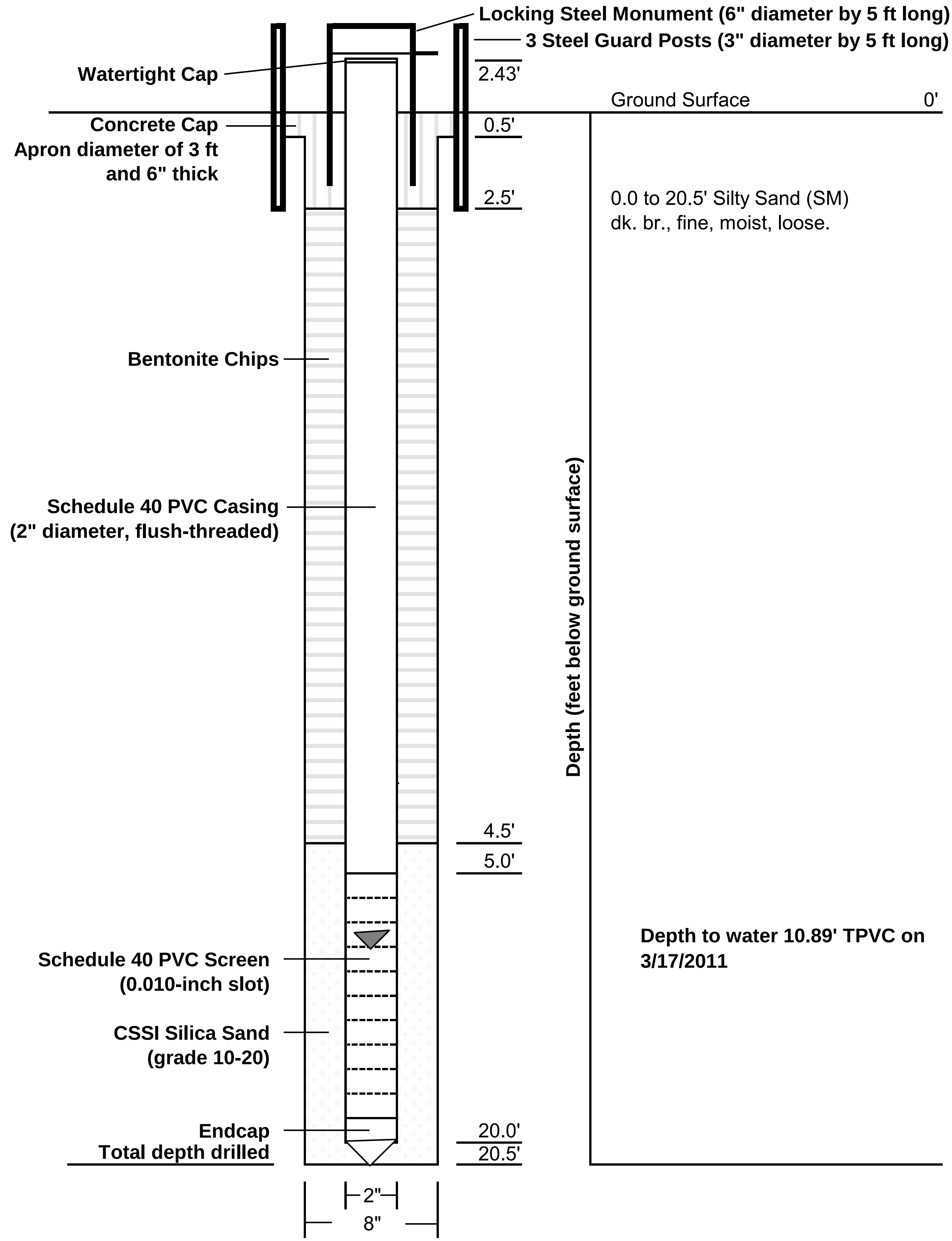
DRAWING NOT TO SCALE
Well Tag BCL 310
Installed March 15, 2011

Figure 2
Monitoring Well Construction Diagram
For Monitoring Well MW-2
Simplot Grower Solutions
Sunnyside Washington



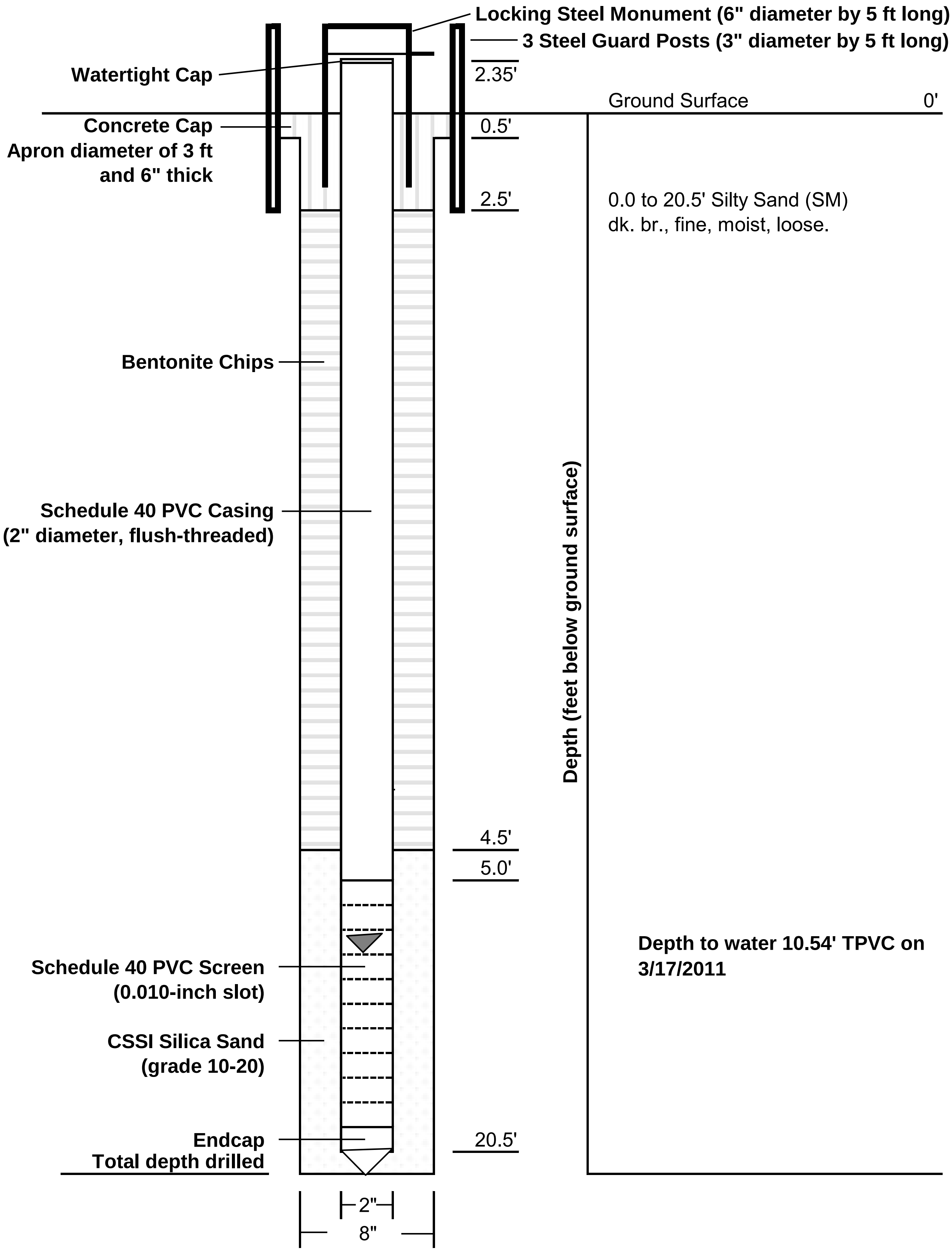
DRAWING NOT TO SCALE
Well Tag BCL 311
Installed March 15, 2011

Figure 3
Monitoring Well Construction Diagram
For Monitoring Well MW-3
Simplot Grower Solutions
Sunnyside Washington



DRAWING NOT TO SCALE
Well Tag BCL 501
Installed March 15, 2011

Figure 4
Monitoring Well Construction Diagram
For Monitoring Well MW-4
Simplot Grower Solutions
Sunnyside Washington



DRAWING NOT TO SCALE
Well Tag BCL 502
Installed March 16, 2011

Figure 5
Monitoring Well Construction Diagram
For Monitoring Well MW-5
Simplot Grower Solutions
Sunnyside Washington

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE19832

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

DEPT OF ECOLOGY Received NOV 27 2012 CENTRAL REGION OFFICE

Construction/Decommission *("x" in box)*
☐ Construction
☒ Decommission 468193

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm HDR Engineering Inc.
Unique Ecology Well IDTag No. BCL 502 MW-5

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee
Name (Print Last, First Name) Sink Ronald
Driller/Engineer /Trainee Signature [signature]
Driller or Trainee License No. 2661

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*
☒ Resource Protection
☐ Geotech Soil Boring

Property Owner Simplot Growers Solutions
Site Address 300 5th 1st Street
City Sunnyside County Yakima
Location SW 1/4-1/4 NW 1/4 Sec 25 Twn 10 R 22
EWM ☒ or WWM ☐

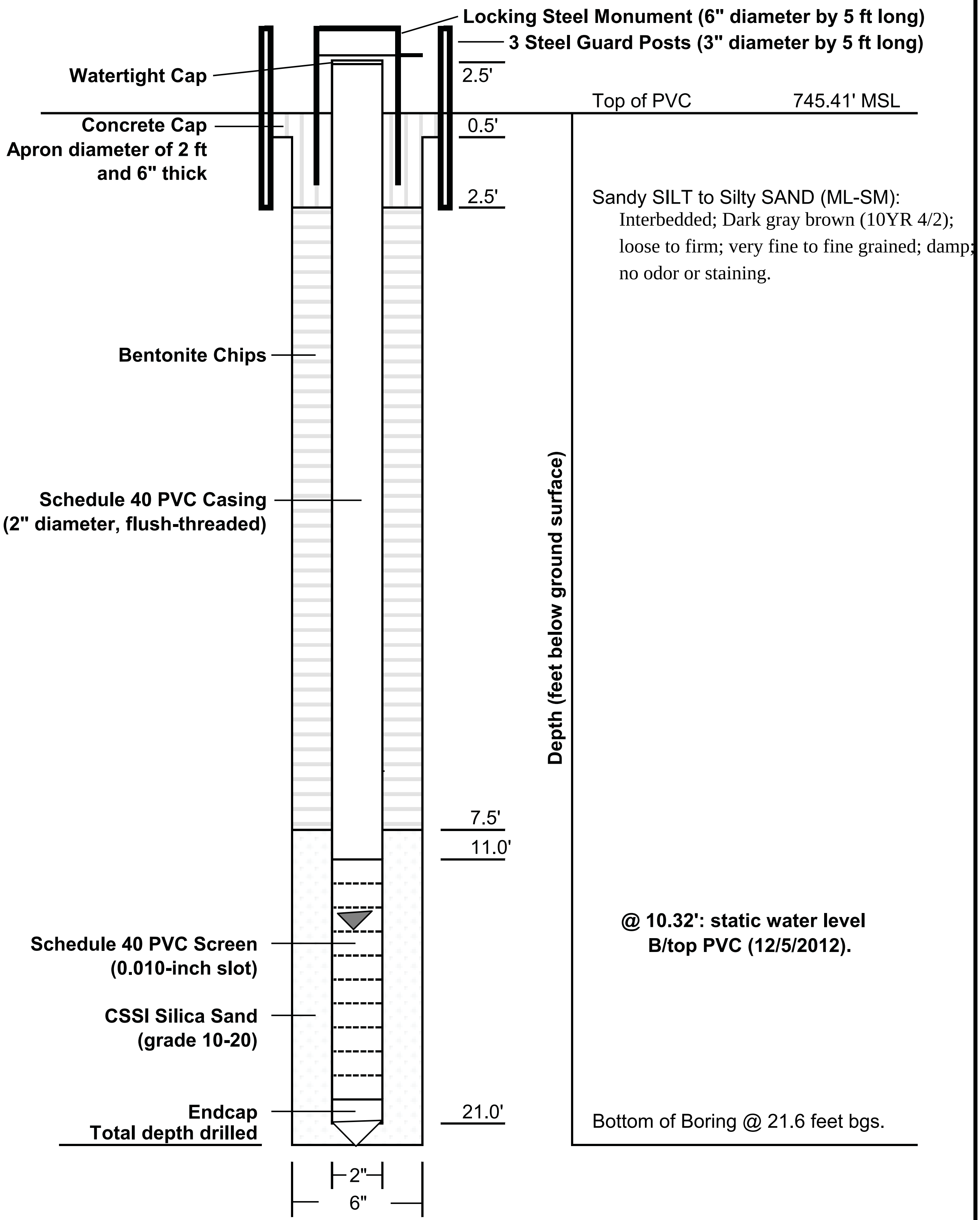
Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____
Long Deg ____ Min ____ Sec ____

Tax Parcel No. 221025/23444
Cased or Uncased Diameter 2" Static Level 11'
Work/Decommission Start Date 11/16/12
Work/Decommission Completed Date 11/16/12

Construction Design	Well Data	Formation Description
- Bentonite - 20'	Abandon: Fill with Bentonite chips & Pull Monument	

SCALE: 1"= N/A PAGE 1 OF 1

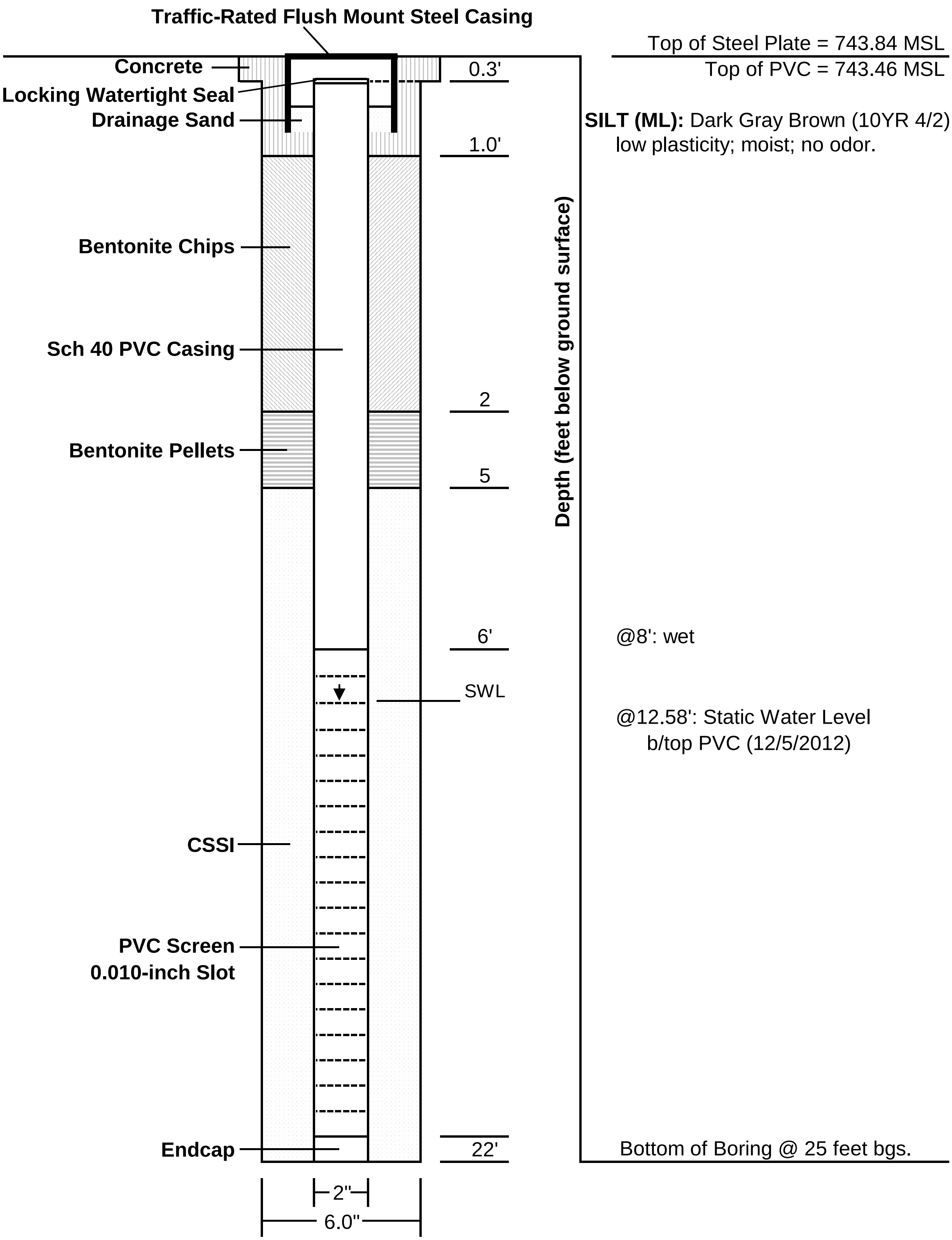
MW-5R



DRAWING NOT TO SCALE
Well Tag BHP 128
Installed November 16, 2012

Monitoring Well Construction Diagram
For Monitoring Well MW-5R
Simplot Grower Solutions
Sunnyside Washington

MW-6

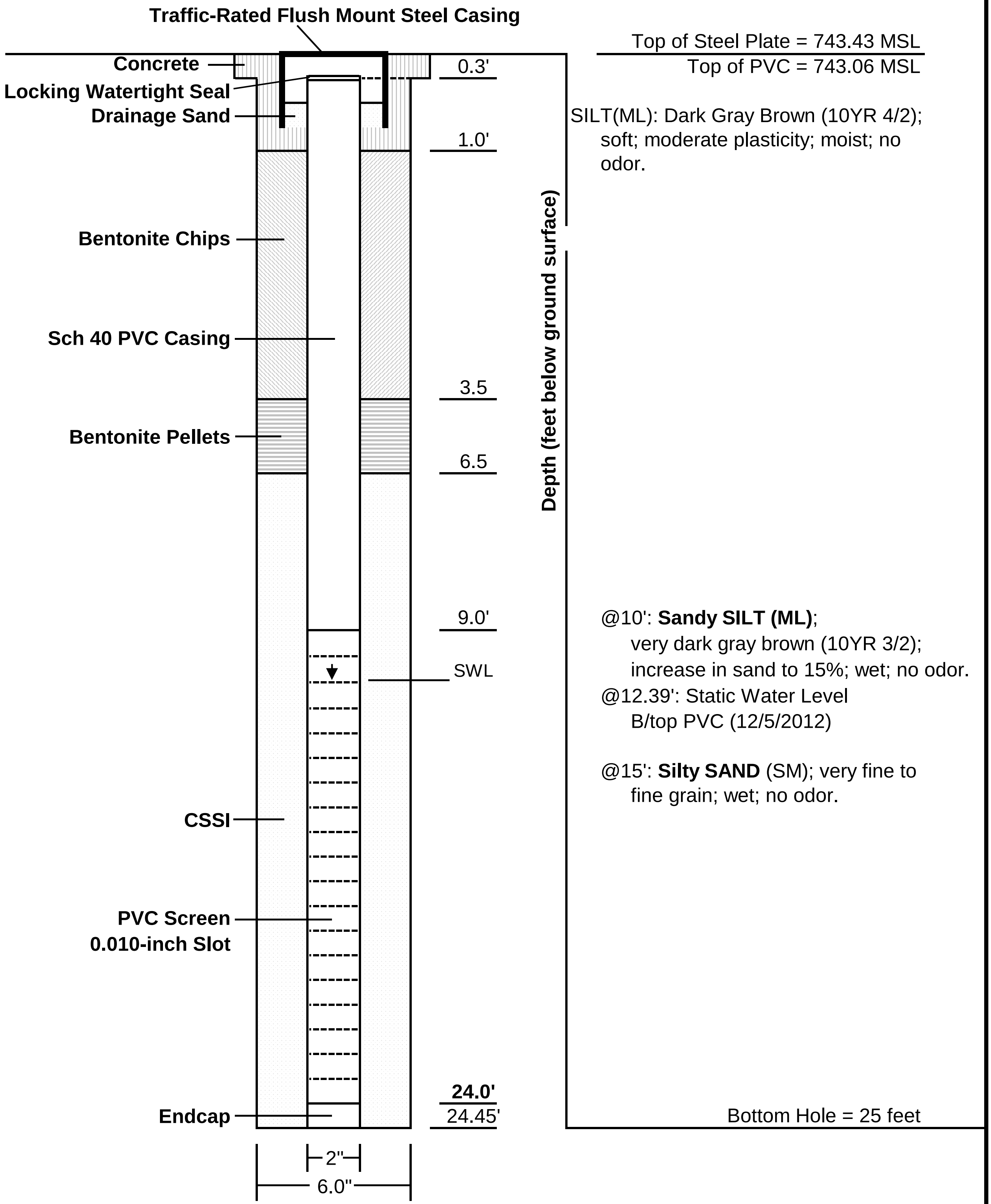


Well Tag BHP 127

Drawing not to scale

Monitoring Well Construction Log
MW - 6
J. R. Simplot Grower Solutions, Sunnyside, WA

MW-7



Well Tag BHP 126

Drawing not to scale

Monitoring Well Construction Log

MW - 7

J. R. Simplot Grower Solutions, Sunnyside, WA

C

Laboratory Reports and Field Sampling Forms (CD only)

D

Groundwater Data Screening

Step 1. List detects and ND fo entire database

X = Detected; NA = not analyzed

Inorganics	ESC Method	ESC RL (mg/L)	Pace RL	Pace Methods (mg/L)	9/24/09 GeoProbe	3/17/11 ESC	6/30/11 ESC	9/15/11 ESC	12/16/11 ESC	12/5/12 ESC	4/4/2013 ESC	7/23/2013 ESC	10/25/2013 ESC	10/30/2014 ESC	4/29/2015 ESC	10/13/2015 ESC	4/19/2016 ESC	10/31/2016 ESC	5/3/2017 ESC	12/27/2017 ESC	4/25/2018 Pace	9/11/2018 Pace
Chloride	9056	1			X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	9056	5			X	NA	NA	NA	NA	NA	X	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-N	350.1	0.1	0.1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	ND	ND	ND
Nitrate-Nitrite	353.2	0.1	1		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RCRA Metals																						
Mercury	7470a	0.0002	0.0002	7470A	X		ND	ND	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	X	ND	ND
Arsenic	6010b	0.020	0.0005	6020B	X	X	X	X	X	X	X	ND	X	X	X	X	X	X	X	X	X	X
Barium	6010b	0.005	0.0003	6020B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cadmium	6010b	0.005	0.0001	6020B	ND		X	ND	ND	X	X	X	X	ND	X	X	X	ND	ND	ND	X	X
Chromium	6010b	0.010	0.0005	6020B	X		ND	ND	ND	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead	6010b	0.005	0.0001	6020B	X	X	ND	X	ND	ND	ND	X	X	ND	X	X	ND	ND	ND	X	X	X
Selenium	6010b	0.020	0.0005	6020B	ND	X	X	ND	X	X	X	X	X	X	x	X	X	X	X	X	X	X
Silver	6010b	0.010	0.0005	6020B	ND		ND	ND	ND	X	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	X	ND
VOCs																						
Acetone	8260B	0.050	0.02	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrolein	8260B	0.050	0.001	8260B	ND		ND	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acrylonitrile	8260B	0.010	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	8260B	0.001	0.001	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromobenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	8260B	0.001	0.001	8260B	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	8260B	0.005	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Butylbenzene	8260B	0.001	0.001	8260B	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
sec-Butylbenzene	8260B	0.001	0.001	8260B	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
tert-Butylbenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon tetrachloride	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	8260B	0.001	0.001	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorodibromomethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	8260B	0.005	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethyl vinyl ether	8260B	0.050	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	8260B	0.003	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	8260B	0.001	0.001	8260B	ND	X	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chlorotoluene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromo-3-Chloropropane	8260B	0.005	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	8260B	0.001	0.004	8260B	X		ND	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromomethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dichlorodifluoromethane	8260B	0.005	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	8260B	0.001	0.001	8260B	X	X	X	X	X	X	X	X	X	X	X	ND	X	X	X	X	X	X
1,1-Dichloroethene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

X = Detected; NA = not analyzed

Inorganics	ESC Method	ESC RL (mg/L)	Pace RL	Pace Methods (mg/L)	9/24/09 GeoProbe	3/17/11 ESC	6/30/11 ESC	9/15/11 ESC	12/16/11 ESC	12/5/12 ESC	4/4/2013 ESC	7/23/2013 ESC	10/25/2013 ESC	10/30/2014 ESC	4/29/2015 ESC	10/13/2015 ESC	4/19/2016 ESC	10/31/2016 ESC	5/3/2017 ESC	12/27/2017 ESC	4/25/2018 Pace	9/11/2018 Pace
1,2-Dichloropropane	8260B	0.001	0.004	8260B	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1,1-Dichloropropene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichloropropane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2-Dichloropropane	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-isopropyl ether	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	8260B	0.001	0.001	8260B	X		ND	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloro-1,3-butadiene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	8260B	0.001	0.001	8260B	X		ND	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p-Isopropyltoluene	8260B	0.001	0.001	8260B	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone (MEK)	8260B	0.010	0.005	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	8260B	0.005	0.004	8260B	ND		ND	ND	ND	ND	ND	X	ND	ND	ND	X	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	8260B	0.010	0.005	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl tert-butyl ether	8260B	0.005	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	8260B	0.001	0.004	8260B	X		X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	8260B	0.001	0.001	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoro	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	8260B	0.005	0.001	8260B	X		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichlorobenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	8260B	0.001	0.0004	8260B	ND	X (Lab)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane	8260B	0.001	0.001	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	8260B	0.001	0.004	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	8260B	0.001	0.001	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trimethylbenzene	8260B	0.001	0.001	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	8260B	0.001	0.001	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	8260B	0.001	0.0002	8260B	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	8260B	0.002	0.003	8260B	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Herbicides

Herbicides	ESC Method	ESC RL (mg/L)	Pace RL	Pace Methods (mg/L)	9/24/09 GeoProbe	3/17/11 ESC	6/30/11 ESC	9/15/11 ESC	12/16/11 ESC	12/5/12 ESC	4/4/2013 ESC	7/23/2013 ESC	10/25/2013 ESC	10/30/2014 ESC	4/29/2015 ESC	10/13/2015 ESC	4/19/2016 ESC	10/31/2016 ESC	5/3/2017 ESC	12/27/2017 ESC	4/25/2018 Pace	9/11/2018 Pace
2,4-D (2,4-Dichlorophenoxyacetic acid	8151	0.002			X	ND	ND	X	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dalapon	8151	0.200			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
2,4-DB	8151	0.002			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dicamba	8151	0.002			ND	ND	X	X	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dichloroprop	8151	0.002			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dinoseb	8151	0.002			X	X	X	X	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
MCPA (2-methyl-4-chlorophenoxyacetic acid)	8151	0.100			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
MCPP (methylchlorophenoxypropionic acid)	8151	0.100			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)	8151	0.002			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
2,4,5-TP (Silvex, 2,4,5-trichlorophenoxy)	8151	0.002			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA

X = Detected; NA = not analyzed

Inorganics	ESC Method	ESC RL (mg/L)	Pace RL	Pace Methods (mg/L)	9/24/09 GeoProbe	3/17/11 ESC	6/30/11 ESC	9/15/11 ESC	12/16/11 ESC	12/5/12 ESC	4/4/2013 ESC	7/23/2013 ESC	10/25/2013 ESC	10/30/2014 ESC	4/29/2015 ESC	10/13/2015 ESC	4/19/2016 ESC	10/31/2016 ESC	5/3/2017 ESC	12/27/2017 ESC	4/25/2018 Pace	9/11/2018 Pace
TPH																						
Gasoline	NWTPHG	0.1			NA	X	X	ND	X	X	X	X	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Diesel	NWTPHD	0.1			NA	X	X	X	X	X	X	ND	ND	X	X	NA	NA	NA	NA	NA	NA	NA
Residual Organics	NWTPHDX				NA	X	ND	X	X	ND	ND			X	X	NA	NA	NA	NA	NA	NA	NA
PAHs																						
Anthracene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Chrysene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Fluorene	8270C	0.00005			NA	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	8270C	0.00005			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Naphthalene	8270C	0.00025			NA	X	X	X	X	ND	X	X	X	ND	X	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	8270C	0.00005			NA	ND	ND	ND	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Pyrene	8270C	0.00005			NA	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
1-Methylnaphthalene	8270C	0.00025			NA	X	X	X	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	8270C	0.00025			NA	X	X	X	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
2-Chloronaphthalene	8270C	0.00025			NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA

Screen Step 2. Remove compounds never detected. Groundwater MW

Inorganics	Method	(mg/L) RL ESC	(mg/L) RL Pace	3/17/11	6/30/11	9/15/11	12/16/11	12/5/12	4/4/2013	7/23/2013	10/25/2013	10/30/2014	4/29/2015	10/13/2015	4/19/2016	10/31/2016	5/3/2017	12/27/2017	4/25/2018	9/11/2018
					ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	Pace	Pace
Sulfate	9056	5		NA	NA	NA	NA	NA	X	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-N	350.1	0.1	0.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	ND	ND	ND
Nitrate-Nitrite	353.2	0.1	1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RCRA Metals																				
Mercury	7470a	0.0002	0.0002	ND	ND	ND	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	X	ND	ND
Arsenic	6010b	0.020	0.0005	X	X	X	X	X	X	ND	X	X	X	X	X	X	X	X	X	X
Barium	6010b	0.005	0.0003	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cadmium	6010b	0.005	0.0001	X	X	ND	ND	X	X	X	X	ND	X	X	X	ND	ND	ND	X	X
Chromium	6010b	0.010	0.0005	ND	ND	ND	ND	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead	6010b	0.005	0.0001	ND	ND	X	ND	ND	ND	X	X	ND	X	X	ND	ND	ND	X	X	X
Selenium	6010b	0.020	0.0005	X	X	ND	X	X	X	X	X	X	x	X	X	X	X	X	X	X
Silver	6010b	0.010	0.0005	ND	ND	ND	ND	X	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	X	ND
VOCs																				
Benzene	8260B	0.001	0.001	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	8260B	0.001	0.001	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chlorotoluene	8260B	0.001	0.001	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dibromoethane	8260B	0.001	0.004	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	8260B	0.001	0.001	X	X	X	X	X	X	X	X	X	X	ND	X	X	X	X	X	X
1,2-Dichloropropane	8260B	0.001	0.004	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Ethylbenzene	8260B	0.001	0.001	ND	ND	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	8260B	0.001	0.001	ND	ND	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride	8260B	0.005	0.004	ND	ND	ND	ND	ND	ND	X	ND	ND	ND	X	ND	ND	ND	ND	ND	ND
Naphthalene	8260B	0.001	0.004	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Propylbenzene	8260B	0.001	0.001	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	8260B	0.001	0.001	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3-Trimethylbenzene	8260B	0.001	0.001	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	8260B	0.001	0.001	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	8260B	0.001	0.0002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes, Total	8260B	0.002	0.003	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Herbicides																				
2,4-D (2,4-Dichlorophenoxyacetic acid	8151	0.002		ND	ND	X	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dicamba	8151	0.002		X	X	X	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dinoseb	8151	0.002		X	X	X	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
TPH																				
Gasoline	NWTPHG›	0.1		X	X	ND	X	X	X	X	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Diesel	NWTPHD›	0.1		X	X	X	X	X	X	ND	ND	X	X	NA	NA	NA	NA	NA	NA	NA
Residual Organics	NWTPHDX			ND	ND	X	X	ND	ND			X	X	NA	NA	NA	NA	NA	NA	NA
PAHs																				
Benzo(a)anthracene	8270C	0.00005		ND	ND	ND	ND	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	8270C	0.00005		ND	ND	ND	ND	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Fluorene	8270C	0.00005		ND	ND	ND	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Naphthalene	8270C	0.00025		X	X	X	X	ND	X	X	X	ND	X	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	8270C	0.00005		ND	ND	ND	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Pyrene	8270C	0.00005		ND	ND	ND	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
1-Methylnaphthalene	8270C	0.00025		X	X	X	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	8270C	0.00025		X	X	X	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA

Screen Step 3. Compounds detected in last 8 sampling events

Inorganics	**Method**	(mg/L) **MDL***	**6/30/11**	**9/15/11**	**12/16/11**	**12/5/12**	**4/4/2013**	**7/23/2013**	10/25/2013	10/30/2014	4/29/2015	10/13/2015	4/19/2016	10/31/2016	5/3/2017	12/27/2017	4/25/2018	9/11/2018
		ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	ESC	Pace	Pace
Sulfate	9056	5	NA	NA	NA	NA	X	X	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia-N	350.1	0.1	X	X	X	X	X	X	X	X	X	X	X	X	X	ND	ND	ND
Nitrate-Nitrite	353.2	0.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RCRA Metals																		
Mercury	7470a	0.0002	ND	ND	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	X	ND	ND
Arsenic	6010b	0.020	X	X	X	X	X	ND	X	X	X	X	X	X	X	X	X	X
Barium	6010b	0.005	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cadmium	6010b	0.005	X	ND	ND	X	X	X	X	ND	X	X	X	ND	ND	ND	X	X
Chromium	6010b	0.010	ND	ND	ND	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead	6010b	0.005	ND	X	ND	ND	ND	X	X	ND	X	X	ND	ND	ND	X	X	X
Selenium	6010b	0.020	X	ND	X	X	X	X	X	X	x	X	X	X	X	X	X	X
Silver	6010b	0.010	ND	ND	ND	X	ND	X	ND	ND	ND	ND	ND	ND	ND	ND	X	ND
VOCs																		
1,2-Dichloroethane	8260B	0.001	X	X	X	X	X	X	X	X	X	ND	X	X	X	X	X	X
1,2-Dichloropropane	8260B	0.001	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Methylene Chloride	8260B	0.005	ND	ND	ND	ND	ND	X	ND	ND	ND	X	ND	ND	ND	ND	ND	ND
Herbicides																		
2,4-D (2,4-Dichlorophenoxyacetic acid	8151	0.002	ND	X	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dicamba	8151	0.002	X	X	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Dinoseb	8151	0.002	X	X	ND	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
TPH																		
Gasoline	NWTPHG:	0.1	X	ND	X	X	X	X	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Diesel	NWTPHD:	0.1	X	X	X	X	X	ND	ND	X	X	NA	NA	NA	NA	NA	NA	NA
Residual Organics	NWTPHDX		ND	X	X	ND	ND	ND	ND	X	X	NA	NA	NA	NA	NA	NA	NA
PAHs																		
Benzo(a)anthracene	8270C	0.00005	ND	ND	ND	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	8270C	0.00005	ND	ND	ND	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Fluorene	8270C	0.00005	ND	ND	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
Naphthalene	8270C	0.00025	X	X	X	ND	X	X	X	ND	X	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	8270C	0.00005	ND	ND	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
Pyrene	8270C	0.00005	ND	ND	X	ND	ND	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA
1-Methylnaphthalene	8270C	0.00025	X	X	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	8270C	0.00025	X	X	X	ND	ND	ND	ND	ND	X	NA	NA	NA	NA	NA	NA	NA

Screen Step 4. Compare to Thresholds

Red = exceeds CLARC

Inorganics	Max Value Max	Notes	Lab (mg/L) RL	Lab (mg/L) Method	(mg/L) Method B Non C	(mg/L) Method B Cancer	(mg/L) Method C Non C	(mg/L) Method C Cancer	(mg/L) MCL Goal	(mg/L) EPA MCL	(mg/L) WA MCL
Sulfate	630		1								
Ammonia-N	0.124		0.1								
Nitrate-Nitrite	**74**		1		25.6		56		10	10	10
RCRA Metals											
Mercury	0.0000494	Filtered?	0.0002	7470A					0.002	0.002	0.002
Arsenic	**0.0956**	Filtered?	0.0005	6020B	0.0048	0.000058	0.0105	0.000583		0.01	0.01
Barium	1.49	Filtered?	0.0003	6020B	3.2		7		2	2	2
Cadmium	0.0028	Filtered?	0.0001	6020B	0.008		0.0175		0.005	0.005	0.005
Chromium	0.098	Filtered?	0.0005	6020B					0.1	0.1	0.1
Lead	**0.044**	Filtered?	0.0001	6020B						0.015	0.015
Selenium	0.0358	Filtered?	0.0005	6020B	0.08		0.175		0.05	0.05	0.05
Silver	0.00068	Filtered?	0.0005	6020B	0.08		0.175				
VOCs											
1,2-Dichloroethane	**0.00374**		0.001	8260B	0.048	0.000481	0.105	0.004808		0.005	0.005
1,2-Dichloropropane	**0.0686**		0.004	8260B	0.72	0.001215	1.575	0.012153		0.005	0.005
Methylene Chloride	0.00188	Lab (all wells)	0.004	8260B	0.048	0.021875	0.105	0.21875		0.005	0.005
Herbicides											
2,4-D (2,4-Dichlorophenoxyacetic acid	0.036	MW-5			0.16		0.35		0.07	0.07	0.07
Dicamba	0.0091	MW-5			0.48		1.05				
Dinoseb	**0.0098**	MW-5 closed			0.016		0.035		0.007	0.007	0.007
TPH											
Gasoline	1.8										
Diesel	2										
Residual Organics	0.26										
PAHs											
Benzo(a)anthracene	0.0000079					0.00012		0.001199			
Benzo(b)fluoranthene	0.0000021					0.00012		0.001199			
Fluorene	0.000055	MW-5			0.64		1.4				
Naphthalene	0.004				0.16		0.35				
Phenanthrene	0.000012										
Pyrene	0.0000053	MW-5			0.48		1.05				
1-Methylnaphthalene	0.000018				0.56	0.001509	1.225	0.015086			
2-Methylnaphthalene	0.000028				0.032		0.07				