WORK PLAN

Additional Delineation of Petroleum Hydrocarbons in the Vadose Zone Soils and Shallow Groundwater

Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, Washington 99350

Prepared for:
Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, WA 99350
And
Washington Department of Ecology (DOE)

Prepared By:
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May 6, 2015

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1.0 PROJECT DESCRIPTION

This work plan, prepared by Blue Mountain Environmental and Consulting Company, Inc. ("BMEC"), presents an approach for conducting additional delineation of petroleum hydrocarbons (PHCs) in the shallow groundwater for the Horse Heaven Hills Travel Plaza property located at 101 Merlot Drive, Prosser, Washington 99350 (hereafter referred to as the "Site").

1.1 Purpose and Objectives

The main objective of this Work Plan is to develop a sampling and analysis program that will further characterize the nature and extent of PHC contamination in shallow groundwater per the Washington Department of Ecology (Ecology) guidelines based on the Model Toxics Control Act (MTCA) Method A Cleanup Levels.

Specific objectives for the investigation include:

- Additional delineation of the horizontal and vertical extent of diesel fuel contamination in the vadose zone soils at concentrations exceeding the MTCA Method A Cleanup Levels for Unrestricted Land Use.

- Additional delineation of the horizontal extent of diesel fuel contamination in the shallow groundwater at concentrations exceeding the MTCA Method A Cleanup Levels.

- Completion of a report documenting the field activities performed during the additional delineation of PHCs in vadose zone soil and groundwater investigation including the results of field activities performed and potential recommendations for future work at the Site.

Although remediation of the subsurface soils and groundwater due to PHC impact is not part of this particular investigation, the details of those remedial efforts are summarized in Section 5.0.

1.2 Location

Legal Description: Parcel number 1-3594-301-1661-001, in the northwest quarter of the southeast quarter of Section 35, Township 9 North, Range 24 East, Willamette Meridian, Benton County. The Site is locally known as Horse Heaven Hills Travel Plaza and the address is 101 Merlot Drive in Prosser, Washington 99350. A Site Location Map of the property and surrounding land is included as **Figure 1**.

The Site is located within the city limits of Prosser, Washington and is surrounded primarily by commercial properties. The property consists of one parcel of land with improvements and is accessible from Merlot Drive. The nearest roadway is Interstate I-82 which is approximately 500 feet north of the Site. The nearest surface water body is the Yakima River approximately one mile southeast and down-gradient of the Site. The approximate Site elevation is 720 feet above mean sea level.

1.3 Organization

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1.4 Schedule

The additional delineation of PHCs in vadose zone soils and shallow groundwater investigation will begin as soon as the work plan has been approved by the Client and Ecology, and the appropriate subcontractor(s) (i.e., driller, underground utility locater, licensed land surveyor, and analytical laboratory) have been secured. The field investigation is expected to take approximately four to five business days for completion of all site work including boring advancement and soil sampling, installation of groundwater monitoring wells, development of the monitoring wells, and one round of groundwater sampling from the full network of monitoring wells (MW-1 thru MW-10). A report on the field investigation and laboratory analytical data results will be completed within an estimated timeframe of eight weeks following completion of all field activities.

1.5 Reports

The project report will include details of all field work and methodologies performed, a summary of laboratory analytical data and related human health risk-based assessments, certified laboratory data report, a Site Map, sample location map(s), photographs of field activities, beneficial water use determination (BWUD) survey results, a land use survey, geologic cross-sections of soil lithology and PHCs in soil, groundwater flow direction and contaminant isocontour maps, and

conclusions and recommendations. All risk-based assessments will be in comparison to Ecology MTCA Method A Cleanup Levels for Unrestricted Land Use.

2.0 SITE BACKGROUND

The Site is defined by a retail petroleum refueling station for standard passenger vehicles, as well as large truck-and-trailer rigs. An aerial view illustrating the approximate location of the Site is included as **Figure 2**. The Site was developed as a retail fuel facility in 1995. A site investigation was performed at the Site by BMEC personnel on September 18, 2013 and the results of that site investigation indicated that petroleum-contaminated soil (PCS) existed in shallow soils beneath several of the diesel fuel dispensers at concentrations exceeding MTCA Method A Cleanup Levels for Unrestricted Land Use.

An additional subsurface investigation performed at the Site on March 13 and 14, 2014, confirmed that PCS existed beneath the diesel fuel dispensers at depths ranging up to approximately 8 feet below surface grade (bsg). A total of 10 soil stockpile samples, 33 soil samples, and three water samples were obtained for laboratory analysis from the Site during the March and April 2014 subsurface investigation activities. Approximately 30,000 cubic feet (ft^3) of soil was excavated from the vicinity of the former diesel fuel pump dispensers in March 2014. Most of this soil was temporarily stockpiled onsite as PCS awaiting future disposal at a licensed waste disposal facility. The stockpiled PCS has since been properly disposed at Anderson Rock and Gravel in Yakima, Washington.

PHC concentrations exceeding MTCA Method A Cleanup Levels were detected in soil sidewall samples, diesel fuel pump dispenser excavation pit bottom soil samples, former underground storage tank (UST) excavation pit soil samples, and a single groundwater sample obtained from the base of the diesel fuel pump dispenser excavation pit. PHCs detected at concentrations exceeding MTCA Method A Cleanup Levels included total petroleum hydrocarbon (TPH) – diesel range (TPH-D), benzene, and polynuclear aromatic hydrocarbons (PAHs) in soil, as well as TPH-D and PAHs in groundwater.

Groundwater was observed to be at an approximate depth of 8 to 8.5 feet bsg on March 13 and 14, 2014 and as shallow as 3 feet bsg on April 23, 2014. Thus, the MTCA Method A Cleanup Level exceedances in soil should technically be considered a potential groundwater issue moving forward.

During the week of August 12 – 15, 2014, a shallow groundwater investigation was conducted at the Site. During the groundwater investigation, seven monitoring wells (MW-1 thru MW-7) were installed at the Site and screened from depths ranging from 4.5 feet to 21.5 feet bsg. A total of 14 soil samples (two per monitoring well boring) and 7 groundwater samples were obtained for laboratory analysis of TPH-D and TPH – heavy oil range (TPH-O) via Northwest Method TPH-

Dx; benzene, toluene, ethylbenzene, and xylenes (BTEX) analysis via Environmental Protection Agency (EPA) Method 8021; and PAHs via EPA Method 8270 SIM.

TPH-D was detected in five soil samples collected in August 2014 and ethylbenzene was detected in one soil sample collected in August 2014, but at concentrations that did not exceed MTCA Method A Cleanup Levels. TPH-D was detected in four groundwater samples collected in August 2014 and TPH-O was detected in one groundwater sample collected in August 2014 at concentrations that did exceed MTCA Method A Cleanup Levels. PAHs were detected in the four groundwater samples analyzed during the August 2014 groundwater investigation, but none of the PAH detections exceeded MTCA Method A Cleanup Levels.

During the groundwater sampling field event conducted at the Site on November 24, 2014, the seven monitoring wells (MW-1 thru MW-7) were monitored and sampled. During the November 2014 groundwater sampling event, the depth to groundwater was approximately 6.25 to 10.25 feet bsg and groundwater flow direction was to the southeast. The laboratory analytical data resulting from the November 2014 sampling event showed evidence of TPH-D detections in the groundwater at concentrations exceeding MTCA Method A Cleanup Levels.

During the groundwater sampling field event conducted at the Site on February 11, 2015, the seven monitoring wells (MW-1 thru MW-7) were monitored and sampled. During the February 2015 groundwater sampling event, the depth to groundwater was approximately 6.25 to 10.20 feet below top of casing and groundwater flow direction was to the southeast. The approximate hydraulic gradient was 0.01 feet per foot between monitoring wells MW-1 and MW-3 and steepened down-gradient to 0.13 feet per foot between monitoring wells MW-3 and MW-6. The laboratory analytical data resulting from the February 2015 groundwater sampling event showed evidence of a TPH-D detection in the groundwater sample obtained from monitoring well MW-5 at a concentration exceeding MTCA Method A Cleanup Levels.

During the groundwater sampling field event conducted at the Site on May 6, 2015, the seven monitoring wells (MW-1 thru MW-7) were monitored and sampled. That report is pending.

Figure 3 illustrates the groundwater flow direction, relative groundwater surface elevations, and diesel detections in groundwater for the August 2014, November 2014, and February 2015 groundwater sampling events. **Figure 4** illustrates the diesel detections in soil per the August 2014 subsurface investigation results.

3.0 GEOLOGY AND HYDROGEOLOGY

According to the U.S. Department of Agriculture Soil Survey of Yakima County, Washington, the Site is underlain by the Ashue Silt Loam which is considered very deep and moderately well-drained with moderately coarse textures. A typical cross-section of the Ashue Silt Loam includes a 9-inch thick surface layer of light brown to brown loam, underlain by an approximate 15-inch thick layer of light gray, gravelly sandy loam, and further underlain by light yellowish brown and pale brown very gravelly sand up to 60 inches thick.

According to Ecology Well Log ID# 139757, the subsurface lithology in the vicinity of the Site is as follows:

- Brown SAND from 0 to 10 feet bsg;
- 2-inch GRAVEL from 10 to 16 feet bsg;
- Black BASALT from 16 to 60 feet bsg;
- Porous (vesicular) BASALT from 60 to 82 feet bsg;
- Black BASALT from 82 to 120 feet bsg; and
- SANDSTONE from 120 to 145 feet bsg.

The static water level for the water well was recorded at 12 feet bsg on October 13, 1978. The well yield was recorded at 75 gallons per minute for the 6-inch diameter water well. A copy of the Well Log ID# 139757 is included in **Appendix A**.

During the onsite field activities conducted March 13 and 14, 2014, the following subsurface lithology was encountered at the Site:

- Asphalt/concrete from 0 to 0.5 feet bgs, rounded pea gravel from 0.5 to 1.0 feet bsg;
- SILT with some rounded gravel from 1.0 to 2.5 feet bsg; and
- Silty, rounded GRAVEL AND COBBLES (river rock) from 2.5 to 8.0 feet bsg.

Groundwater was encountered during the March 13 and 14, 2014 field activities at an approximate depth of 8 to 8.5 feet bsg. During a site visit on April 23, 2014, the groundwater surface had risen to an elevation approximately three feet bsg.

During the subsurface drilling activities conducted at the Site from August 12 – 14, 2014, the following soil lithology was encountered:

- Asphalt from 0 to 0.5 feet bsg;
- Brown to gray-brown SILT to silty SAND from 0.5 to 4 feet bsg in most borings (except MW-5);
- Brown to gray-brown silty to sandy, subrounded to rounded GRAVEL from 4 to 9 feet bsg in most borings (except MW-5);
- Mixtures of brown to gray-brown silty to sandy subrounded to rounded GRAVEL and BASALT COBBLES or BOULDERS from 9 to 19 feet bsg;
- Dark gray to brown CLAY and SILT with little gravel from 19 to 21.5 feet (MW-7); and
- Gray, silty GRAVEL from 21.5 to 22 feet bsg.

Figure 5 illustrates the transect locations of cross-sections A-A' and B-B'. **Figures 6 and 7** illustrate the geologic cross-sections of A-A' and B-B', respectively, per the soil lithology encountered during the August 12 – 14, 2014 subsurface investigation.

During the subsurface drilling activities conducted at the Site from August 12 – 14, 2014, groundwater was encountered at depths ranging from 5.5 feet bsg in monitoring well MW-5 to 9 feet bsg in well MW-7. Depth-to-water measurements on August 15, 2014 ranged from 2.68 feet below top of casing in monitoring well MW-7 to 4.73 feet below top of casing in well MW-6.

Regionally, the Site is located in the Yakima Fold Belt east of the Cascade Range in a climate that receives between 6 to 18 inches of precipitation annually. The Yakima Fold Belt is dominated by east-west trending anticlinal ridges and synclinal valley(s). The Site is located southeast of the Rattlesnake Mountains and immediately north of the Horse Heaven Hills. The near surface soils are formed primarily from deposition of Quaternary sediments that overlie Miocene Columbia River Basalt Group flood basalts. Fine-grained slackwater sediments characterized by rhythmically graded bedding were deposited throughout the Pleistocene atop the Miocene basalts in the area of the Columbia Gorge extending north to the Yakima Valley including the region surrounding the Site. Volcanic ash deposits and wind-blown loess deposits are also noted throughout the region.

4.0 SUBSURFACE INVESTIGATION APPROACH

Due to coarse-grained soil lithology (i.e., coarse gravel, cobbles, and basalt boulders), sonic drilling methodology has been chosen to advance borings into the subsurface and collect soil samples from each boring for laboratory analysis. Each of the proposed borings shall be completed as a monitoring well for subsequent assessment of PHCs in the shallow groundwater. The rationale behind the placement of the monitoring wells and the laboratory analyses recommended is detailed in the following text.

4.1 Vadose Zone Soils and Shallow Groundwater Investigation

The proposed additional delineation of PHCs in vadose zone soils and shallow groundwater investigation consists of the collection and laboratory analysis of soil and groundwater samples. Three monitoring wells (MW-8 thru MW-10) are proposed to be installed at locations down-gradient of the seven existing monitoring wells (MW-1 thru MW-7). The locations of the proposed monitoring wells (MW-8 thru MW-10) are illustrated on **Figure 8.** Detailed descriptions of the proposed field screening and soil sampling strategy are included below in Section 4.1.1. Detailed descriptions of the boring advancement and monitoring well installations are included below in Section 4.1.2. Detailed descriptions of the monitoring well development and groundwater sampling methodologies are included below in Section 4.1.3.

4.1.1 Soil Sampling

Two soil samples shall be obtained from each monitoring well boring. Up to six soil samples shall be obtained for laboratory analysis from the three borings. The field geologist will visually assess all soil brought to the surface per monitoring well boring, and record the soil lithology on the boring logs. The field geologist will field screen each section of soil with a photo-ionization

detector (PID) and the various PID readings will be recorded on the boring log. Soil samples will be obtained for laboratory analyses based on a combination of the PID readings, olfactory and visible evidence, and location of soil/groundwater interface. All soil samples will also be assessed by sheen testing (adding water to a small volume of soil retained in the palm of the hand and checked for the presence of an oily sheen).

Sonic drilling methodology will be used to advance a 5-foot long hollow, steel rod into the subsurface. The 5-foot long steel rod will be advanced in approximate 5-foot intervals, then retrieved to the surface and vibrated to allow the subsurface soils to be encapsulated in a 5-foot plastic liner. The 5-foot interval procedure shall be repeated to the bottom of the boring. The thin plastic liner with soil shall be placed on the field table, cut open by the drillers, and the professional geologist shall visually assess the soil lithology, moisture content, and obtain soil samples for analysis.

4.1.2 Drilling and Monitoring Well Installation

During March and April 2014 field activities conducted at the Site, well-rounded GRAVEL AND COBBLES (river rock) was encountered near the base of the 8 foot deep excavation and BASALT bedrock was encountered at approximately 13 feet bsg in the excavation(s) [**Figures 6 and 7**]. Groundwater was encountered at an approximate depth of 8 feet bsg. Thus, monitoring well borings (MW-8 thru MW-10) shall be advanced and continuously sampled via sonic drilling methodology to depths of 15 to 20 feet bsg with screened intervals ranging from the base of the boring to approximately 5 feet bsg.

A total of three 2-inch diameter, flush-mounted monitoring wells will be installed down-gradient of the existing monitoring well network, in an attempt to further delineate the full extent of PHCs (i.e., diesel) in the shallow groundwater beneath the Site and immediately down-gradient of the Site. The proposed locations of the three monitoring wells are illustrated on **Figure 8**.

Each monitoring well shall be constructed of schedule 40 PVC with 10 to 15 feet of 0.010-slotted screen. In theory, all three monitoring wells should be installed no deeper than 20 feet bsg. Each well shall be completed with a sandpack installed from the base of the boring to a depth 2 to 3 feet above the top of the screened interval; a 1- to 2-foot bentonite plug shall be placed on top of the sandpack; a bentonite/grout mixture shall be placed on top of the bentonite plug to within approximately one foot of the ground surface; and the well shall be completed with a lock and cap.

A total of three monitoring wells (MW-8 thru MW-10) are proposed for installation during this phase of the additional delineation of PHCs in the vadose zone soils and shallow groundwater. Rationale for the location of the three proposed monitoring wells is as follows:

- One proposed monitoring well (MW-8) shall be located down-gradient of existing monitoring wells MW-4 and MW-5, yet positioned at a location "between" the two existing wells in an effort to further define the lateral extent of the dissolved-phase PHC plume along the western edge.

- One proposed monitoring well (MW-9) shall be located down-gradient of existing monitoring wells MW-5 and MW-6, yet positioned at a location "between" the two existing wells in an effort to further define the furthest down-gradient extent of the dissolved-phase PHCs beneath the Site and/or immediately offsite in the down-gradient direction.
- One proposed monitoring well (MW-10) shall be located down-gradient of existing monitoring wells MW-6 and MW-7, yet positioned at a location "between" the two existing wells in an effort to further define the lateral extent of the dissolved-phase PHC plume along the eastern edge.

4.1.3 Monitoring Well Development and Groundwater Sampling

A minimum of 2 days and no more than one week shall pass after the installation of each monitoring well, prior to the initialization of monitoring well development. Depth-to-water static level measurements shall be obtained per monitoring well from a mark on the PVC top of casing (north side) via a water level meter that has been decontaminated, prior to introduction into each successive monitoring well.

Each monitoring well shall be developed by manual surging repeatedly with a PVC surge block along the entire length of the screen via 3- to 4-foot strokes continued for periods of 2 to 4 minutes. In between periods of surging, a manual well developer pump will be used to remove approximately 10 standing well volumes from the well casing while measuring groundwater parameters (i.e., pH, temperature, and conductivity) to assess when stabilization of the aquifer in the vicinity of each specific monitoring well has occurred. When the groundwater parameters have all stabilized [temperature (± 3°F); pH (± 0.1 unit); conductivity (± 3%)] for three successive readings and subsequent to the removal of approximately 10 standing water well volumes, the monitoring well will be considered to be fully developed. Although turbidity will not be quantitatively measured in the field, a visual assessment of turbidity will be monitored and noted during well development. The groundwater parameters shall be recorded on groundwater sampling data sheets and included in the ensuing report.

At least 24 hous subsequent to monitoring well development, groundwater sampling in each well will be conducted using low-flow purging submersible bladder pump and tubing.
During sampling, new tubing (and rope) will be lowered down the well casing. Groundwater sample containers will be prepared according to protocol established by the analytical laboratory.

4.1.4 Sample Collection

A fresh pair of latex or Nitrile gloves shall be donned, prior to collection of each successive soil and groundwater sample. Soil samples shall be collected in 4-ounce glass jars and/or three laboratory preserved 40-milliliter (ml) glass vials per EPA Method 5035A. Soil samples collected in 4-ounce glass jars shall be obtained with little to no head space. Soil samples collected in 40-ml vials will consist of approximately 5 gram aliquots of soil per vial as collected via the laboratory-provided T-Bar handle or plastic syringe device. Preservation with methanol of each 40-ml vial per EPA Method 5035A shall be prepared in the laboratory prior to soil sampling in the field.

Groundwater samples shall be collected in 40-ml glass vials preserved with hydrochloric acid and after eliminating the headspace in the vial, for BTEX analysis, as well as 1-Liter amber glass containers preserved with hydrochloric acid or unpreserved depending on which analysis (TPH-Dx or PAHs) will be performed on the sample.
The samples will be stored in a cool environment (approximately 4 degrees Celsius) until relinquished (with properly completed chain-of-custody documentation) to ALS Environmental Laboratory (ALS) in Everett, Washington. All sampling tools will be decontaminated between collection of successive samples, or disposed of properly.

4.2 Laboratory Analytical Methods

The soil and groundwater samples will be relinquished to the laboratory for TPH-D and TPH-O analysis via Northwest Method NWTPH-Dx, as well as BTEX analysis via EPA Method 8021B. Field collection of all soil samples for BTEX analysis will be via EPA Method 5035A.
Furthermore, all soil samples with PHC concentrations exceeding MTCA Method A Cleanup Levels for Unrestricted Land Use (TPH-D or TPH-O > 2000 milligrams per Kilogram [mg/Kg]; benzene > 0.03 mg/Kg; toluene > 7 mg/Kg; ethylbenzene > 6 mg/Kg; and xylenes > 9 mg/Kg), shall also be analyzed via EPA Method 8270 SIM for PAHs. All groundwater samples with PHC concentrations exceeding MTCA Method A Cleanup Levels (TPH-D or TPH-O > 500 micrograms per liter [µg/L]; benzene > 5 µg/L; toluene > 1000 µg/L; ethylbenzene > 700 µg/L; and xylenes > 1000 µg/L), shall also be analyzed via EPA Method 8270 SIM for PAHs.

4.3 Data Quality Objectives and Sample Analysis

Data quality objectives for the proposed investigation are to generate data of known and documented quality that can be used to determine whether chemicals of potential concern are present above detection levels and at levels that pose an unacceptable risk to receptors. Data will be compared to MTCA Method A Cleanup Levels for Unrestricted Land Use to determine whether these levels are exceeded and to support decision-making regarding the need for further investigation and/or remediation.

4.4 Quality Assurance

Samples will be obtained according to standard field methods and will be prepared in accordance with protocol established by the analytical laboratory for containers, preservation, storage and transport to the laboratory. Proper chain-of-custody documentation will be prepared for all samples obtained for laboratory analysis. Appropriate decontamination procedures will be followed to prevent cross contamination of the drilling and sampling equipment between drill holes, as well as the soil and groundwater samples between sample depths and between drilling hole locations. During drilling, a continuous geologic boring log will be prepared describing the subsurface materials encountered, presence of saturated zones, field screening data, and any other pertinent geologic or environmental observations.

4.5 Investigation-Derived Waste Disposal

All soil and water (i.e., purged groundwater and decontamination water) investigation-derived waste (IDW) shall be containerized in separate 55-gallon drums. Each drum shall be properly labeled, sealed, and temporarily staged onsite at a location approved by the client, prior to future

disposal at a licensed waste facility. All gloves, plastic, paper towels, bailers and rope shall be containerized in a plastic trash bag and disposed onsite as standard refuse.

4.6 Licensed Land Surveyor

Subsequent to installation of all new monitoring wells, a land surveyor licensed in the state of Washington shall be hired to survey the elevation of the wells above mean sea level. The elevation datum per monitoring well shall be measured to the nearest hundredth of a foot from the north side of the inner 2-inch diameter PVC casing.

4.7 Underground Utility Locator

Utility locating services, including private locating services shall be utilized prior to the commencement of any intrusive groundwork. An attempt will be made to locate all underground utilities via maps provided by the client and/or via the underground utility locating company personnel. All located underground utilities shall be illustrated on a map of the Site and included in the final report. Furthermore, a private utility locator shall be hired to clear each of the monitoring well locations, prior to the advancement of any subsurface drilling activities.

5.0 STATEMENT OF ENVIRONMENTAL PROFESSIONALS

We shall perform this additional delineation of PHCs in vadose zone soils and shallow groundwater investigation in accordance with generally accepted environmental practices and procedures, as of the date of this work plan. We shall employ the degree of care and skill ordinarily exercised under similar circumstances by reputable environmental professionals practicing in this area. The proposed monitoring well locations and sampling strategy recommended within this work plan are based upon site conditions we readily observed or which were reasonably ascertainable and present at the time of previous field work performed by BMEC personnel.

Brent N. Bergeron, WA Professional Geologist

6.0 REFERENCES

Blue Mountain Environmental & Consulting Co, GROUNDWATER MONITORING WELL SAMPLING REPORT, Horse Heaven Hills Travel Plaza, 101 Merlot Drive, Prosser, Washington 99350, March 6, 2015

Blue Mountain Environmental & Consulting Co, GROUNDWATER MONITORING WELL SAMPLING REPORT, Horse Heaven Hills Travel Plaza, 101 Merlot Drive, Prosser, Washington 99350, December 15, 2014

Blue Mountain Environmental & Consulting Co, WORK PLAN: Delineation of Subsurface Petroleum Hydrocarbon Contamination in the Vadose Zone Soils and Groundwater-Horse Heaven Hills Travel Plaza, 101 Merlot Drive, Prosser, Washington 99350, May 28, 2014

Blue Mountain Environmental & Consulting Co, Delineation of Subsurface Petroleum Hydrocarbon Contamination-Horse Heaven Hills Travel Plaza, 101 Merlot Drive, Prosser, Washington 99350, May 5, 2014

Blue Mountain Environmental & Consulting Co, WORK PLAN: Delineation of Subsurface Petroleum Hydrocarbon Contamination-Horse Heaven Hills Travel Plaza, 101 Merlot Drive, Prosser, Washington 99350, December 17, 2013

Blue Mountain Environmental & Consulting Co, Phase I Environmental Site Assessment Report-Horse Heaven Hills Travel Plaza, 101 Merlot Drive, Prosser, Washington 99350, August 20, 2013

Google Earth, Aerial Photo of Prosser, Washington, pre-March 2014

Washington Department of Ecology, Model Toxics Control Act Statute and Regulation, Revised November 2007

Image Provided by ESRI

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101 Merlot Drive
Prosser, WA 99350

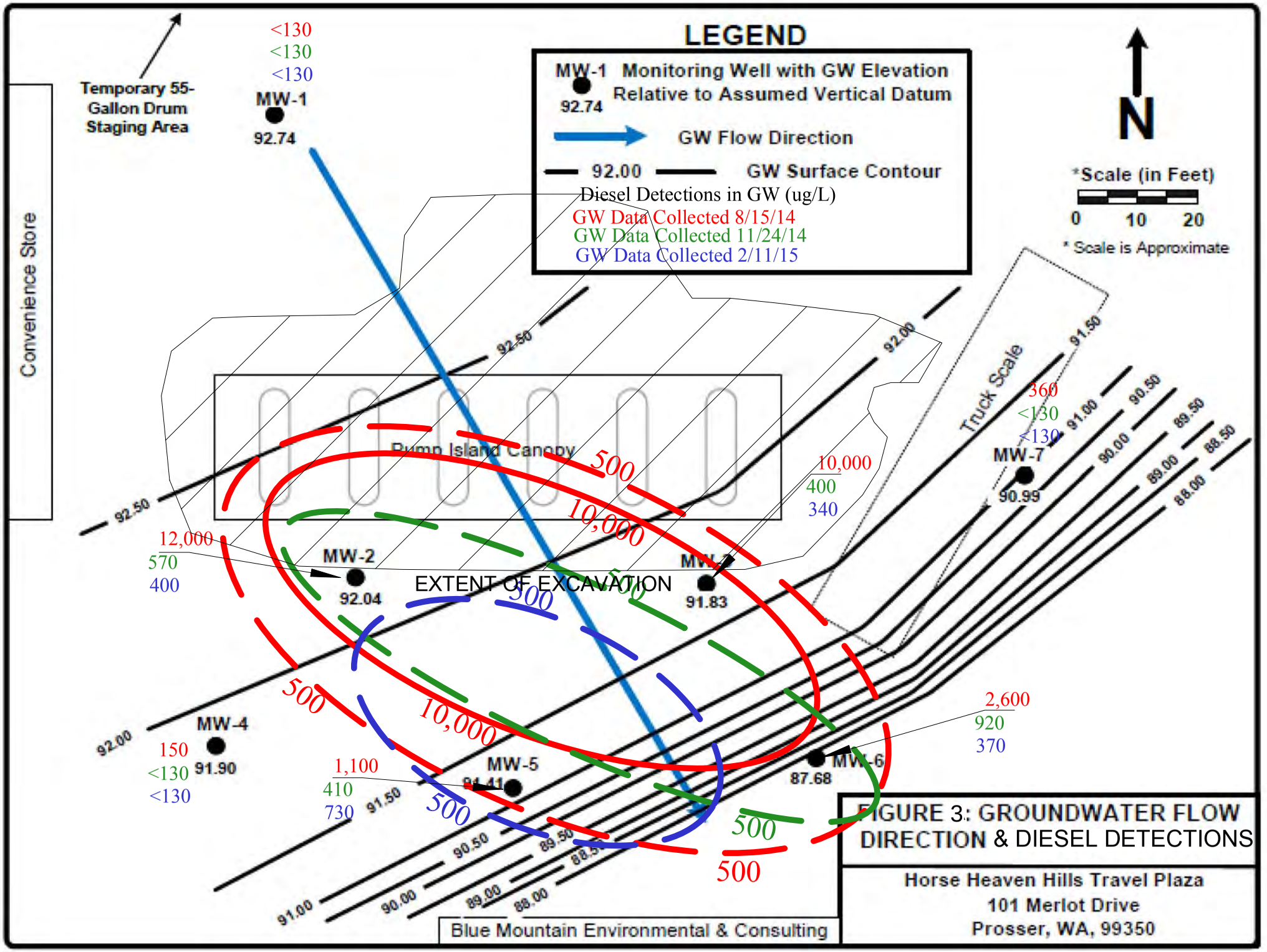
FIGURE 1: SITE LOCATION MAP

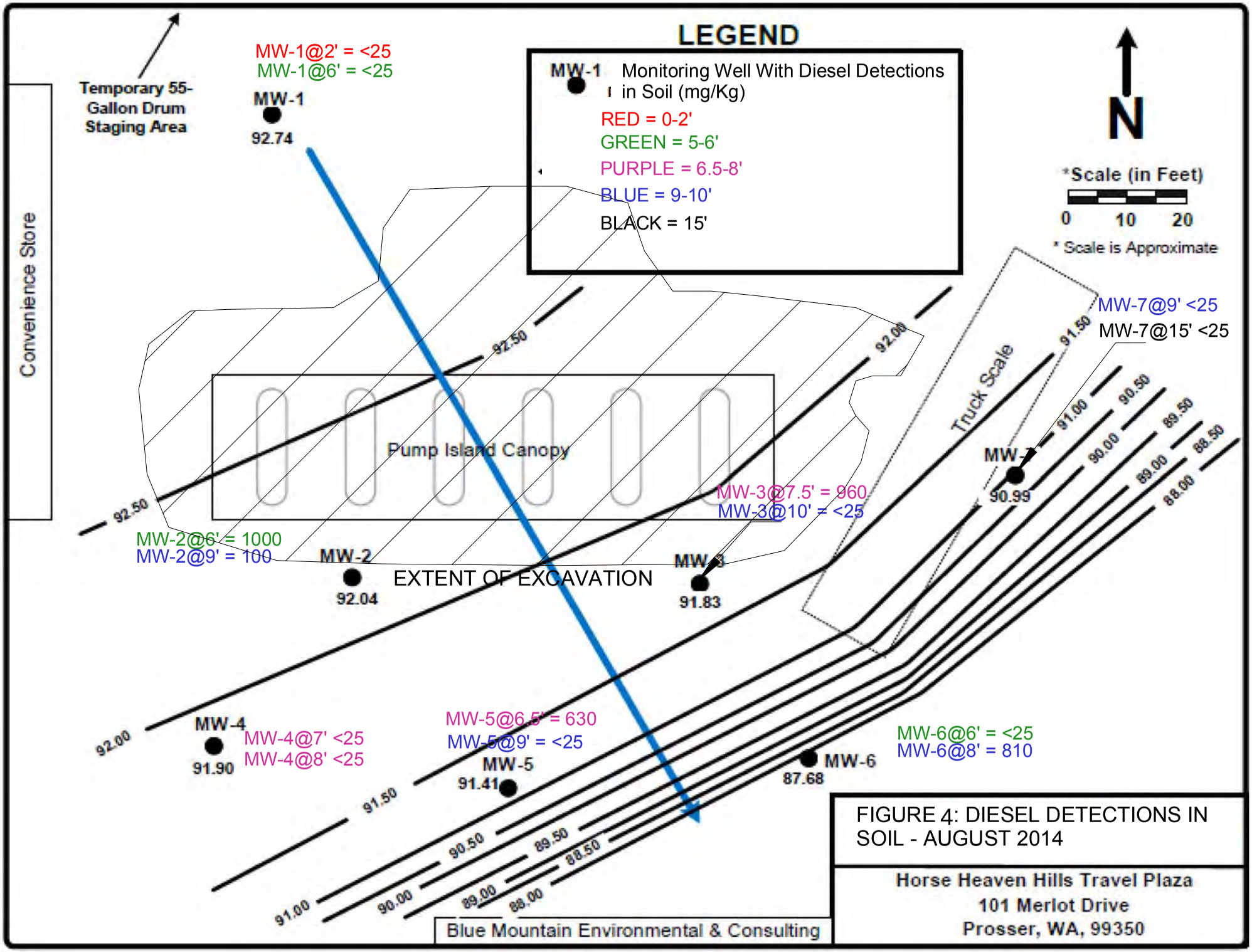
Google earth

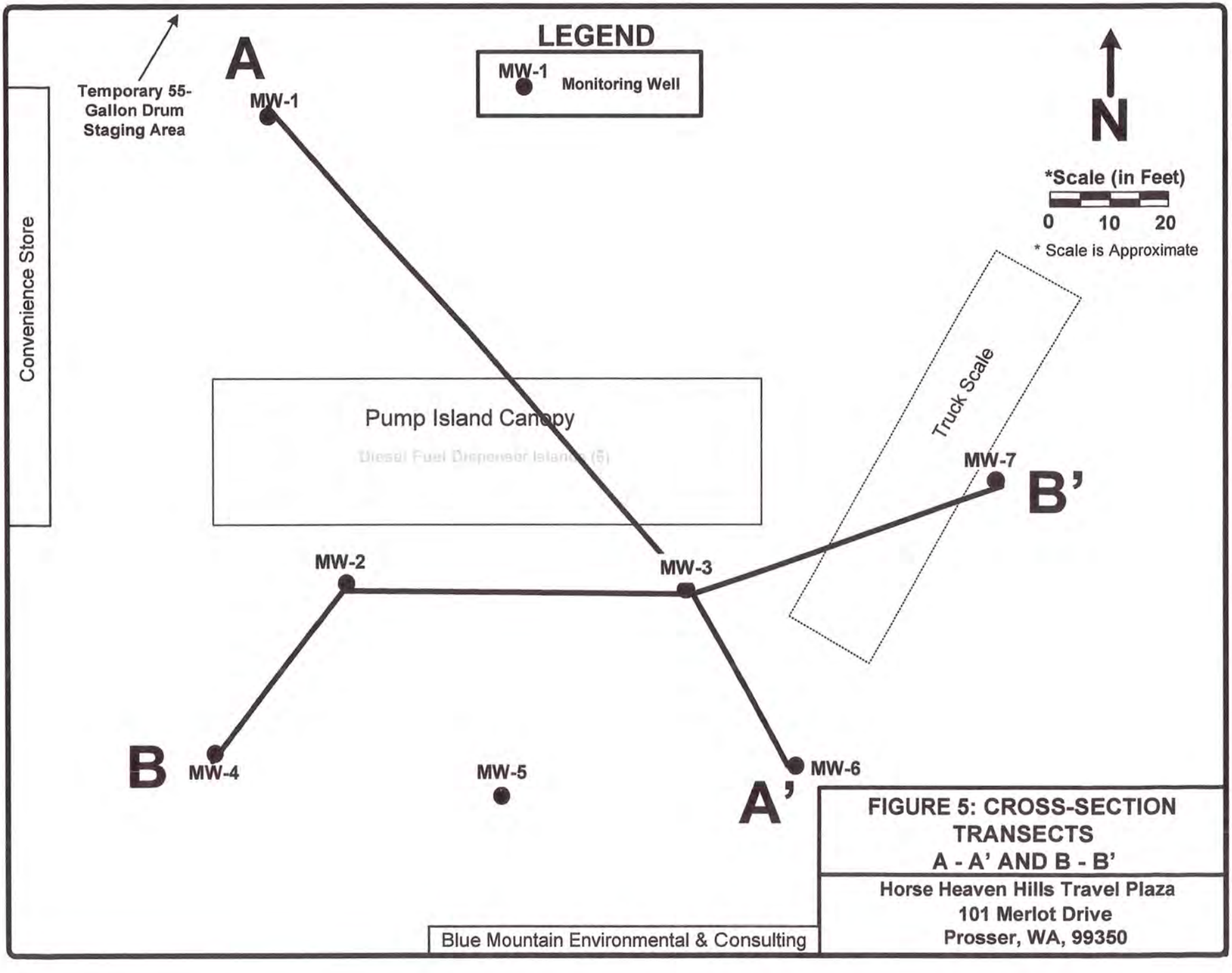
feet 200
meters 80

N

FIGURE 2: AERIAL VIEW	May 6, 2015
Horse Heaven Hills Travel Plaza 101 Merlot Drive Prosser, Washington 99350	**Blue Mountain Environmental & Consulting Co. Inc.** **PO Box 545/125 Main Street** **Waitsburg, Washington 99361** **509-520-6519**


LEGEND
MW-1 Monitoring Well with GW Elevation Relative to Assumed Vertical Datum
92.74
GW Flow Direction
92.00 GW Surface Contour
Diesel Detections in GW (ug/L)
GW Data Collected 8/15/14
GW Data Collected 11/24/14
GW Data Collected 2/11/15
N
*Scale (in Feet)
0 10 20
* Scale is Approximate
Temporary 55-Gallon Drum Staging Area
Convenience Store
Pump Island Canopy
Truck Scale
EXTENT OF EXCAVATION
MW-1
92.74
<130
<130
<130
MW-2
92.04
12,000
570
400
MW-3
91.83
10,000
400
340
MW-4
91.90
150
<130
<130
MW-5
91.41
1,100
410
730
MW-6
87.68
2,600
920
370
MW-7
90.99
360
<130
<130
500
10,000
92.50
92.00
91.50
91.00
90.50
90.00
89.50
89.00
88.50
88.00
FIGURE 3: GROUNDWATER FLOW DIRECTION & DIESEL DETECTIONS
Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, WA, 99350
Blue Mountain Environmental & Consulting


LEGEND
MW-1 Monitoring Well With Diesel Detections in Soil (mg/Kg)
RED = 0-2'
GREEN = 5-6'
PURPLE = 6.5-8'
BLUE = 9-10'
BLACK = 15'
N
*Scale (in Feet)
0 10 20
* Scale is Approximate
Temporary 55-Gallon Drum Staging Area
Convenience Store
Pump Island Canopy
Truck Scale
EXTENT OF EXCAVATION
MW-1@2' = <25
MW-1@6' = <25
MW-1
92.74
MW-2@6' = 1000
MW-2@9' = 100
MW-2
92.04
MW-3@7.5' = 960
MW-3@10' = <25
MW-3
91.83
MW-4
91.90
MW-4@7' <25
MW-4@8' <25
MW-5@6.5' = 630
MW-5@9' = <25
MW-5
91.41
MW-6
87.68
MW-6@6' = <25
MW-6@8' = 810
MW-7@9' <25
MW-7@15' <25
MW-7
90.99
92.50
92.00
91.50
91.00
90.50
90.00
89.50
89.00
88.50
88.00
FIGURE 4: DIESEL DETECTIONS IN SOIL - AUGUST 2014
Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, WA, 99350
Blue Mountain Environmental & Consulting


LEGEND
MW-1 Monitoring Well
N
*Scale (in Feet)
0 10 20
* Scale is Approximate
Temporary 55-Gallon Drum Staging Area
Convenience Store
Pump Island Canopy
Diesel Fuel Dispenser Islands (5)
Truck Scale
A
A'
B
B'
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
FIGURE 5: CROSS-SECTION TRANSECTS
A - A' AND B - B'
Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, WA, 99350
Blue Mountain Environmental & Consulting

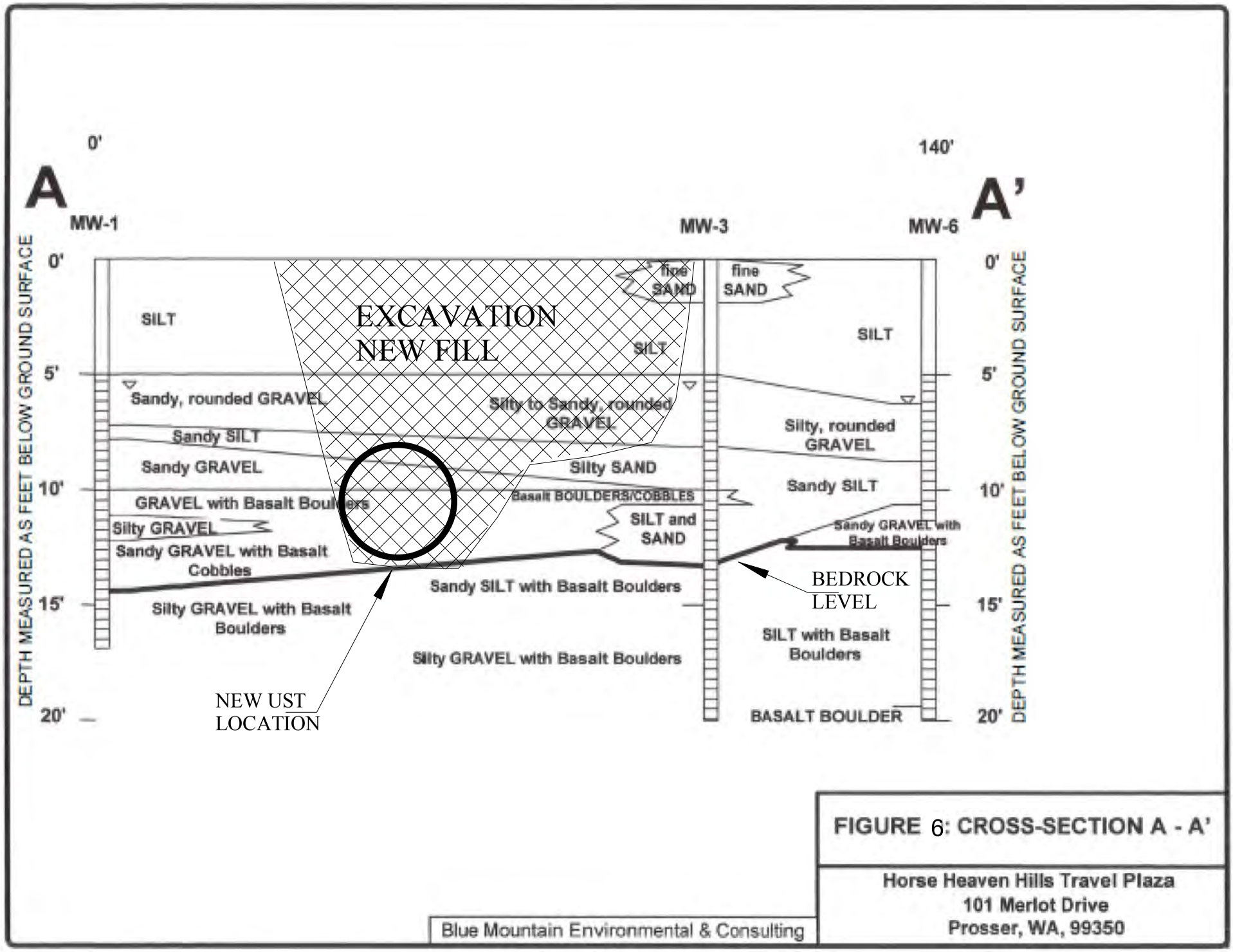


FIGURE 6: CROSS-SECTION A - A'

Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, WA, 99350

Blue Mountain Environmental & Consulting

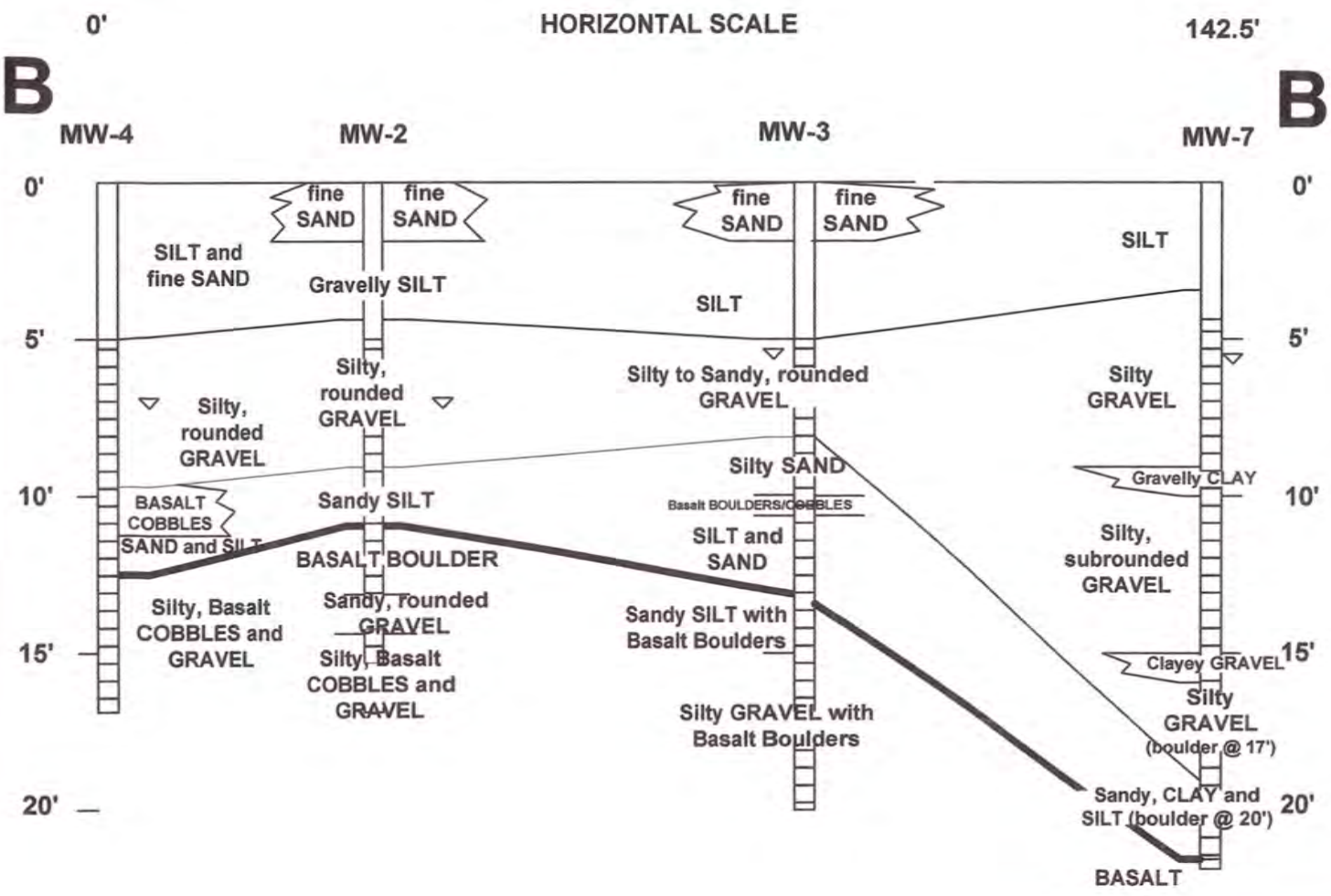


FIGURE 7: CROSS-SECTION B - B'

Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, WA, 99350

Blue Mountain Environmental & Consulting

Google earth

feet 200
meters 80

N

LEGEND

MW-5 Exisiting Monitoring Well

MW-8 Proposed Monitoring Well

FIGURE 8: PROPOSED MONITORING WELL LOCATIONS

May 6, 2015

Horse Heaven Hills Travel Plaza
101 Merlot Drive
Prosser, Washington 99350

Blue Mountain Environmental & Consulting Co. Inc.
PO Box 545/125 Main Street
Waitsburg, Washington 99361
509-520-6519

APPENDIX A

Water Well Log

File Original and First Copy with Department of Ecology
Second Copy — Owner's Copy
Third Copy — Driller's Copy

WATER WELL REPORT

STATE OF WASHINGTON

Application No.
Permit No.

(1) **OWNER:** Name Felipe OLVERA Address RT 3 Box 3035 Prosser

(2) **LOCATION OF WELL:** County Benton — SW ¼ SW ¼ Sec. 35 T. 9 N., R. 24 W.M.

Bearing and distance from section or subdivision corner

(3) **PROPOSED USE:** Domestic ☒ Industrial ☐ Municipal ☐ Irrigation ☐ Test Well ☐ Other ☐

(4) **TYPE OF WORK:** Owner's number of well (if more than one)
New well ☒ Deepened ☐ Reconditioned ☐
Method: Dug ☐ Bored ☐ Cable ☐ Driven ☐ Rotary ☒ Jetted ☐

(5) **DIMENSIONS:** Diameter of well 6" inches.
Drilled ft. Depth of completed well 145 ft.

(6) **CONSTRUCTION DETAILS:**

Casing installed: " Diam. from ft. to ft.
Threaded ☐ " Diam. from ft. to ft.
Welded ☐ 6" Diam. from ft. to ft.

Perforations: Yes ☐ No ☐
Type of perforator used
SIZE of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

Screens: Yes ☐ No ☐
Manufacturer's Name
Type Model No.
Diam. Slot size from ft. to ft.
Diam. Slot size from ft. to ft.

Gravel packed: Yes ☐ No ☐ Size of gravel:
Gravel placed from ft. to ft.

Surface seal: Yes ☒ No ☐ To what depth? 20 ft.
Material used in seal BenTonite
Did any strata contain unusable water? Yes ☐ No ☒
Type of water? Depth of strata
Method of sealing strata off

(7) **PUMP:** Manufacturer's Name Sears & Roebuck
Type: Submersible HP 1/2

(8) **WATER LEVELS:** Land-surface elevation above mean sea level ft.
Static level 12 ft. below top of well Date 10-13-78
Artesian pressure lbs. per square inch Date
Artesian water is controlled by (Cap, valve, etc.)

(9) **WELL TESTS:** Drawdown is amount water level is lowered below static level
Was a pump test made? Yes ☒ No ☐ If yes, by whom? US
Yield: ± 75 gal./min. with ft. drawdown after hrs.

Recovery data (time taken as zero when pump turned off) (water level measured from well top to water level)

Time	Water Level	Time	Water Level	Time	Water Level

Date of test
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? Yes ☐ No ☐

(10) **WELL LOG:** N

Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
Brown Sand	0	10
2" Gravel	10	16
Black Basalt	16	60
Porous Basalt	60	82
Black Basalt	82	120
SandStone	120	145

RECEIVED
NOV 13 1978
DEPARTMENT OF ECOLOGY

Work started 10-11, 1978. Completed 10-13, 1978

WELL DRILLER'S STATEMENT:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME ~~[illegible]~~ St. George Drilling (Person, firm, or corporation) (Type or print)

Address RT 4 Box 9005 W. Richland wash

[Signed] Donald St. George (Well Driller)

License No. 0491 Date 10-13, 1978