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# TECHNICAL MEMORANDUM

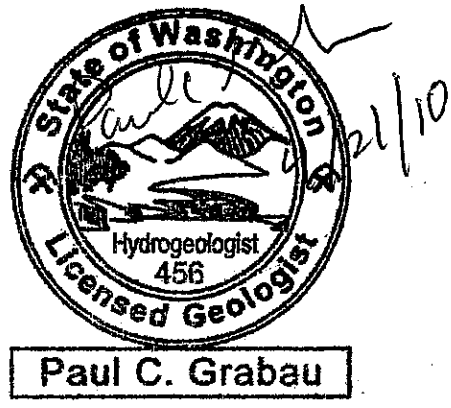
**TO:** Mark Adams, L.H.G. – Washington State Department of Ecology

**cc:** Marty Winn, former property owner
William Joyce, Salter Joyce Ziker, P.L.L.C.
John North, Delta Environmental Consultants, Inc.
David Campbell, current property owner

**FROM:** Paul Grabau, L.H.G., Principal Hydrogeologist

**DATE:** April 21, 2010

**RE:** **FEBRUARY 2010 PROGRESS REPORT**
**WHIDBEY MARINE & AUTO SUPPLY SITE**
**FREELAND, WASHINGTON**
**FARALLON PN: 454-001**




## INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this progress report to document the status of the cleanup action related to the release of gasoline from the underground storage tank (UST) system at the Whidbey Marine & Auto Supply facility at 1689 Main Street in Freeland, Washington (herein referred to as the Facility) (Figure 1). The cleanup action at the Facility is being conducted under the Washington State Department of Ecology (Ecology) Voluntary Cleanup Program and in accordance with the provisions of the Washington State Model Toxics Control Act Cleanup Regulation (MTCA), as established in Chapter 173-340 of the Washington Administrative Code. The Facility has been assigned Toxics Cleanup Program Identification Number NW1529 by Ecology.

This progress report presents the results of the groundwater monitoring event completed in February 2010 and a discussion of the overall progress of the cleanup action.

## GROUNDWATER MONITORING

The groundwater monitoring conducted at the Facility on February 10 and 12, 2010 included obtaining depth to groundwater measurements and collecting groundwater samples from monitoring wells MW-1 through MW-4, MW-6, and MW-8 through MW-12 (Figure 2). Monitoring well MW-5 was dry at the time of the February 2010 monitoring event and has been since installation. There also was an insufficient volume of groundwater in monitoring well MW-7 for collection of a representative sample during the February 2010 monitoring event. Monitoring wells MW-1 through MW-8 are installed in the perched groundwater zone at the Site. Monitoring wells MW-9 through MW-12 are installed within the deeper sea level aquifer. Details of the field activities and the results for the February 2010 monitoring and sampling event are presented below.

### FIELD METHODS

Prior to sampling, Farallon measured the depth to groundwater in each monitoring well using an electronic water-level indicator. The monitoring wells were opened and the water levels were allowed to equilibrate before measurement. The groundwater level in each monitoring well was measured to the surveyed reference point on the top of the well casing to derive the groundwater elevation at each location.

Groundwater was purged from each monitoring well at a flow rate of approximately 200 milliliters per minute using a bladder pump, where feasible. Field measurements were collected for pH, temperature, specific conductivity, dissolved oxygen, and oxidation/reduction potential during groundwater purging using a YSI Model 600XL water quality analyzer equipped with a flow-through cell. Groundwater samples were collected after the temperature, conductivity, and pH parameters stabilized. Stabilization was determined as a relative percent difference of less than 3 percent for temperature and conductivity, and a change of $\pm$0.1 pH unit between readings for three consecutive measurements. The samples from monitoring wells MW-1 through MW-4 and MW-8 through MW-12 were collected by pumping groundwater directly from each well through dedicated polyethylene tubing into laboratory-prepared containers. There was not a sufficient volume of groundwater present in monitoring well MW-6 at the time of sampling to utilize the bladder pump so a disposable bailer was used to purge and collect the groundwater samples from the well. A minimum of three submerged casing volumes of water was purged from monitoring well MW-6 using a disposable bailer prior to sample collection. Groundwater samples were collected from monitoring well MW-6 by decanting the groundwater directly from the disposable bailer into laboratory-prepared containers. The samples were labeled, placed on ice, and transported to CCI Analytical Laboratories, Inc. in Everett, Washington for analysis following chain-of-custody protocols.

### ANALYTICAL METHODS

The groundwater samples were analyzed for the presence of total petroleum hydrocarbons as gasoline-range organics (GRO) by Northwest Method NWTPH-Gx and for benzene, toluene, ethylbenzene, and xylenes (BTEX) by U.S. Environmental Protection Agency Method 8021B. The groundwater sample collected from monitoring well MW-12 was also analyzed for the

presence of total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO) by Northwest Method NWTPH-Dx.

## GROUNDWATER MONITORING RESULTS

Table 1 presents a summary of the groundwater elevation data for the Facility. Table 2 presents the groundwater analytical results for GRO and BTEX for February 2010 and previous quarterly monitoring events. Table 3 presents the groundwater analytical results for DRO and ORO for the February 2010 and May 2009 monitoring events. A comparison to the corresponding MTCA Method A groundwater cleanup levels is also provided on Tables 2 and 3. A copy of the laboratory analytical report for the February 2010 groundwater monitoring event is provided as Attachment A.

### Groundwater Elevation

Groundwater elevations measured at the Facility on February 10, 2010 in the perched groundwater zone ranged from 65.32 feet above mean sea level (msl) in monitoring well MW-1 to 57.13 feet above msl in monitoring well MW-6. Groundwater elevations measured at the Facility on February 10, 2010 in the sea level aquifer ranged from 11.20 feet above msl in monitoring well MW-10 to 10.87 feet above msl in monitoring well MW-12 (Table 1). Monitoring well MW-5 has been dry each time it has been monitored since it was installed in February 2007. Groundwater elevation contours for the perched groundwater zone and sea level aquifer based on the water levels measured on February 10, 2010 are shown on Figures 3 and 4, respectively.

As shown on Figure 3, the general groundwater flow direction in the perched groundwater zone at the Facility is to the west, with a hydraulic gradient of approximately 0.02 foot per foot in the eastern area of the Facility and a considerably steeper gradient of 0.18 foot per foot to the west (Figure 3). The general groundwater flow direction in the sea level aquifer in the vicinity of the Facility was to the south-southeast based on the February 10, 2010 measurements with a hydraulic gradient of approximately 0.002 foot per foot (Figure 4).

### Analytical Results

The analytical results identified the presence of GRO and various BTEX constituents at concentrations above their respective MTCA Method A cleanup levels in the groundwater samples collected during the February 2010 monitoring event as follows (Table 2):

- Monitoring well MW-2 – GRO at 15,000 micrograms per liter (µg/l) and xylenes at 3,800 µg/l;
- Monitoring well MW-4 – GRO at 71,000 µg/l, toluene at 20,000 µg/l, ethylbenzene at 940 µg/l, and xylenes at 5,900 µg/l;
- Monitoring well MW-6 – GRO at 89,000 µg/l, toluene at 16,000 µg/l, ethylbenzene at 1,800 µg/l and xylenes at 14,000 µg/l;

- Monitoring well MW-8 – GRO at 54,000 µg/l, toluene at 3,900 µg/l, ethylbenzene at 2,000 µg/l, and xylenes at 12,000 µg/l;
- Monitoring well MW-9 – GRO at 32,000 µg/l, benzene at 10,000 µg/l, toluene at 9,800 µg/l, and xylenes at 1,800 µg/l;
- Monitoring well MW-11 – GRO at 23,000 µg/l, benzene at 4,000 µg/l; toluene at 7,000 µg/l, and xylenes at 1,600 µg/l; and
- Monitoring well MW-12 – GRO at 52,000 µg/l, benzene at 92 µg/l, toluene at 3,900 µg/l, ethylbenzene at 1,300 µg/l, and xylenes at 8,400 µg/l.

The laboratory reporting limits for benzene were elevated to levels above the MTCA Method A cleanup levels for the groundwater samples collected from monitoring wells MW-2, MW-4, MW-6, and MW-8. The groundwater analytical results for GRO and the BTEX constituents for the February 2010 sampling event are shown on Figure 5.

GRO and the BTEX constituents were not detected at concentrations above their respective MTCA Method A cleanup levels in the groundwater samples collected from monitoring wells MW-1, MW-3, or MW-10 during the February 2010 monitoring event.

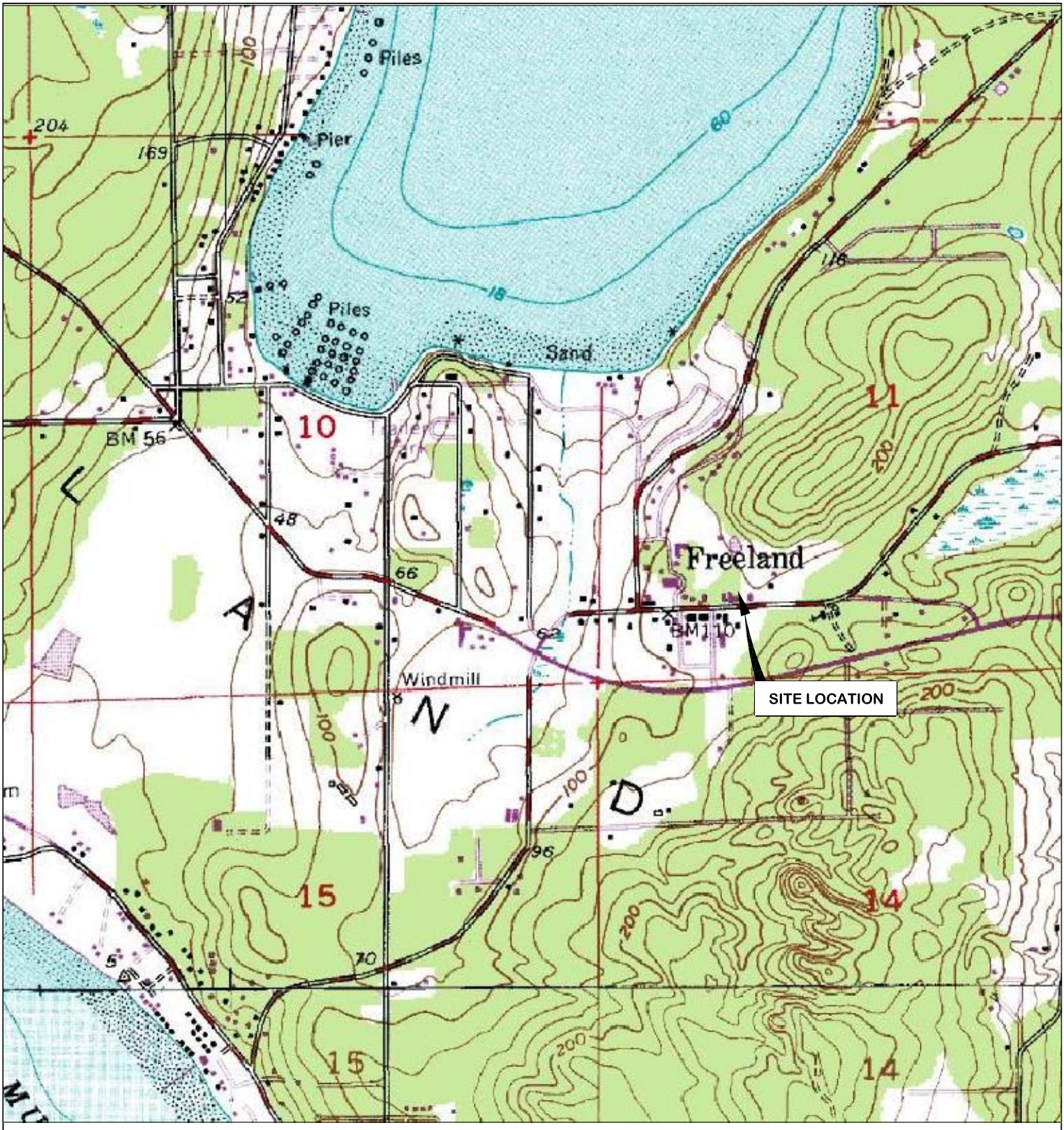
The analytical results identified the presence of DRO in the groundwater sample collected from monitoring well MW-12 at a concentration above the MTCA Method A cleanup level of 500 µg/l (Table 3). However, the laboratory report noted that the DRO result of 2,600 µg/l for the sample was biased high due to overlap from the GRO range.

## CLOSING

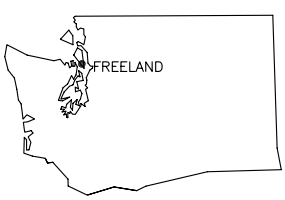
Farallon is currently coordinating with drilling and chemical injection technology contractors regarding the logistics and feasibility of chemical injection into the perched groundwater zone at the Facility. Farallon is in the process of contacting owners of properties located south of the Facility that did not respond to the two groundwater user surveys that were sent out by the Island County Health Department in 2006 and 2009 to determine whether water wells are located on their properties. An updated groundwater user survey will be submitted to Ecology once the remaining land owners have been contacted.

Attachments: Figure 1, *Site Vicinity Map*
Figure 2, *Site Plan*
Figure 3, *Groundwater Elevation Contours - Perched Groundwater Zone*
Figure 4, *Groundwater Elevation Contours – Sea Level Aquifer*
Figure 5, *Site Plan showing Groundwater Analytical Results – February 2010*
Table 1, *Groundwater Elevation Data*
Table 2, *Summary of Laboratory Results for GRO and BTEX in Groundwater Samples*
Table 3, *Summary of Laboratory Results for DRO and ORO in Groundwater Samples*
Attachment A, Laboratory Analytical Report

PG:pg




REFERENCE: 7.5 MINUTE USGS QUADRANGLE FREELAND, WASHINGTON. DATED 1993

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Issaquah, WA 98027

# FIGURE 1

SITE VICINITY MAP
WHIDBEY MARINE & AUTO SUPPLY
1689 MAIN STREET
FREELAND, WASHINGTON

FARALLON PN: 454-001

| Drawn By: DEW | Checked By: PJ | Date: 7/11/07 | Disk Reference: 454001 |
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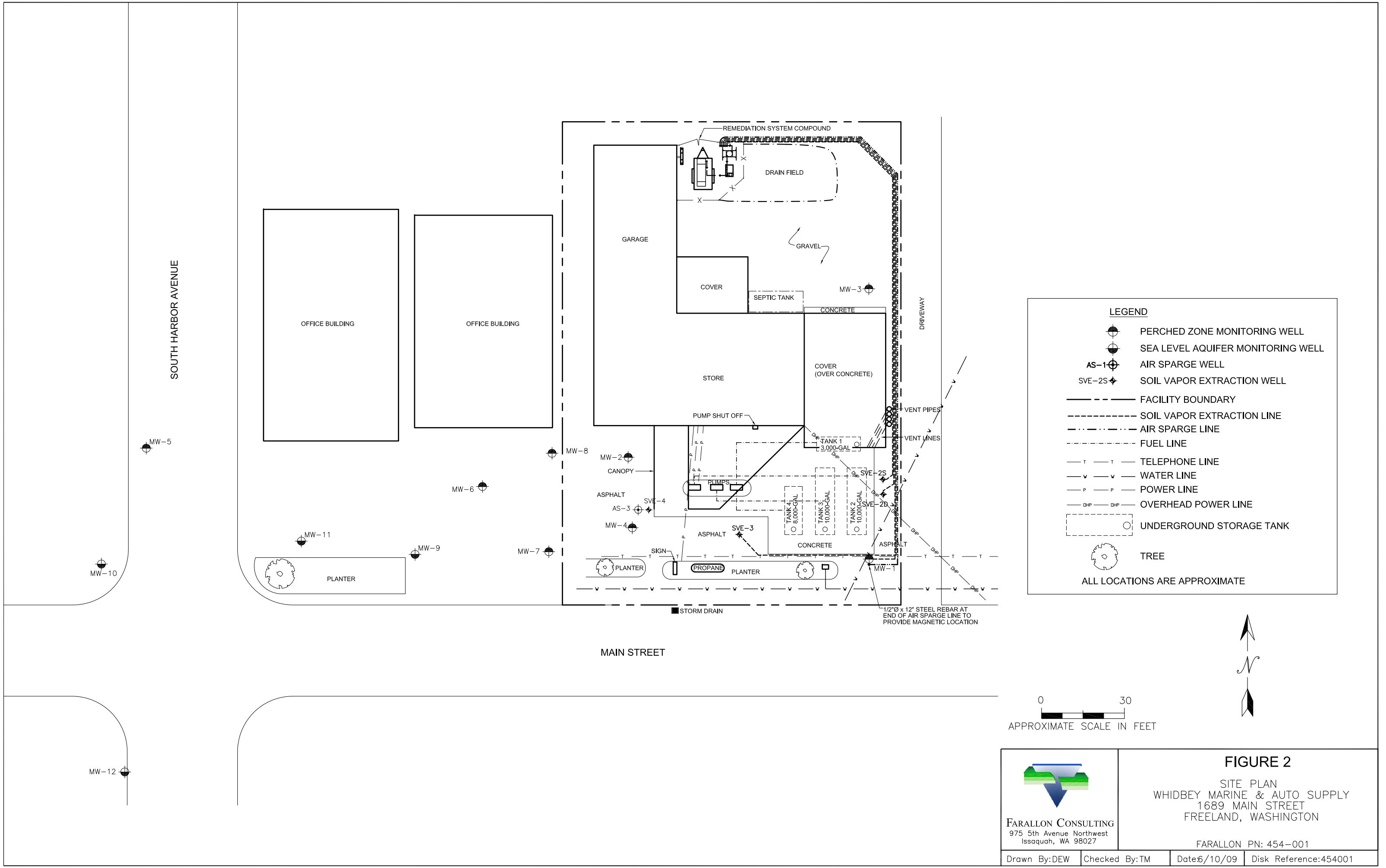


# FIGURE 2

SITE PLAN
WHIDBEY MARINE & AUTO SUPPLY
1689 MAIN STREET
FREELAND, WASHINGTON

FARALLON PN: 454-001


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Issaquah, WA 98027


| Drawn By: DEW | Checked By: TM | Date: 6/10/09 | Disk Reference: 454001 |
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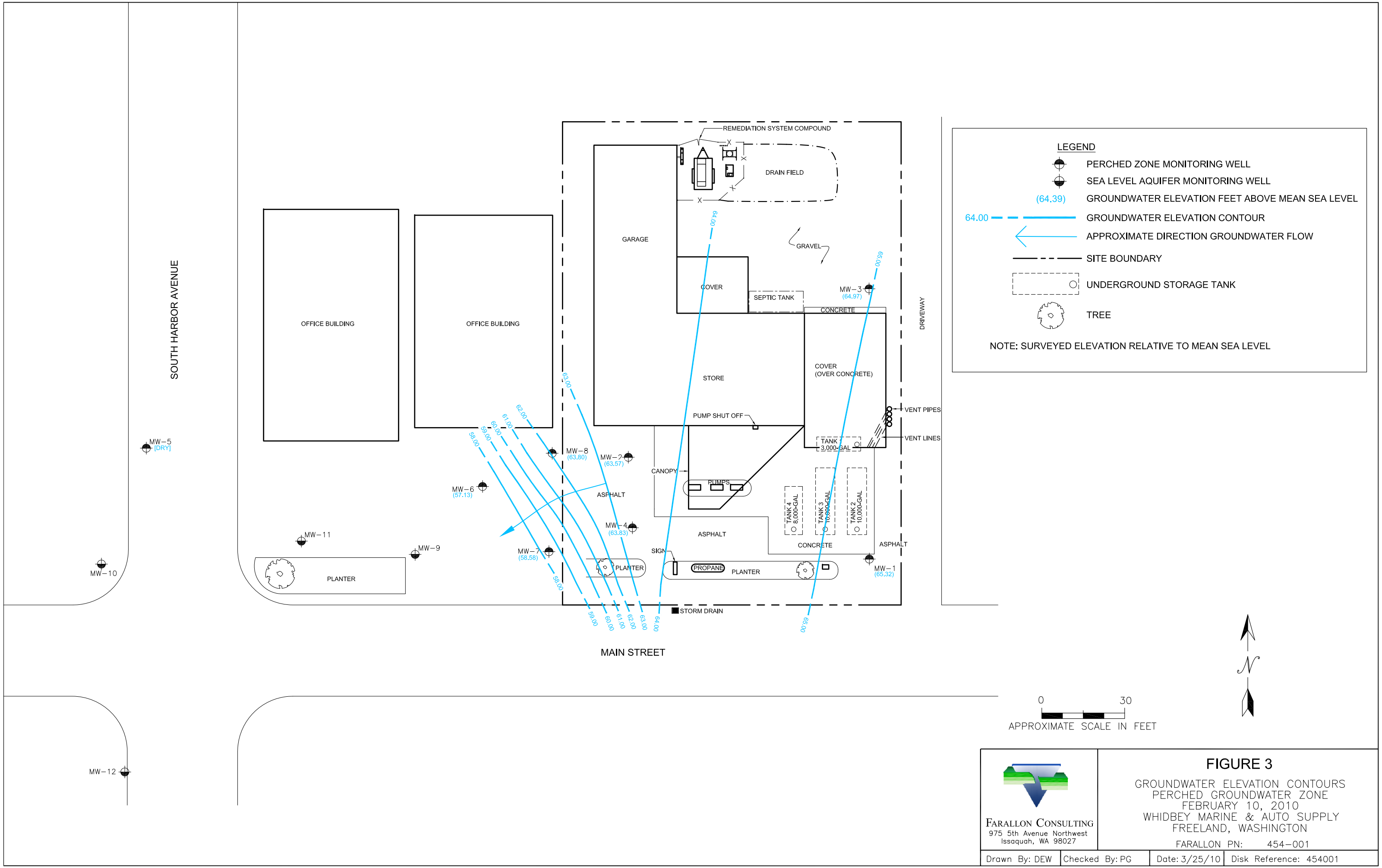


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# FIGURE 3

GROUNDWATER ELEVATION CONTOURS
PERCHED GROUNDWATER ZONE
FEBRUARY 10, 2010
WHIDBEY MARINE & AUTO SUPPLY
FREELAND, WASHINGTON

FARALLON PN: 454-001

| Drawn By: DEW | Checked By: PG | Date: 3/25/10 | Disk Reference: 454001 |
|---|---|---|---|

SOUTH HARBOR AVENUE

OFFICE BUILDING

OFFICE BUILDING

REMEDIATION SYSTEM COMPOUND

DRAIN FIELD

GARAGE

GRAVEL

COVER

SEPTIC TANK

MW-3

CONCRETE

DRIVEWAY

STORE

COVER
(OVER CONCRETE)

VENT PIPES

VENT LINES

PUMP SHUT OFF

TANK 1
3,000-GAL

MW-5

MW-8

MW-2

CANOPY

PUMPS

MW-6

ASPHALT

TANK 4
8,000-GAL

TANK 3
10,000-GAL

TANK 2
10,000-GAL

MW-4

ASPHALT

CONCRETE

ASPHALT

MW-7

SIGN

PLANTER

PROPANE

PLANTER

MW-1

STORM DRAIN

11.20

11.10

11.00

MW-11
(11.15)

MW-9
(11.00)

MW-10
(11.20)

PLANTER

MW-12
(10.87)

MAIN STREET

LEGEND

PERCHED ZONE MONITORING WELL

SEA LEVEL AQUIFER MONITORING WELL

(64.39) GROUNDWATER ELEVATION FEET ABOVE MEAN SEA LEVEL

64.00 GROUNDWATER ELEVATION CONTOUR

APPROXIMATE DIRECTION GROUNDWATER FLOW

SITE BOUNDARY

UNDERGROUND STORAGE TANK

TREE

NOTE: SURVEYED ELEVATION RELATIVE TO MEAN SEA LEVEL

N

0 30

APPROXIMATE SCALE IN FEET

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# FIGURE 4

GROUNDWATER ELEVATION CONTOURS
SEA LEVEL AQUIFER
FEBRUARY 10, 2010
WHIDBEY MARINE & AUTO SUPPLY
FREELAND, WASHINGTON

FARALLON PN: 454-001

| Drawn By: DEW | Checked By: JP | Date: 4/2/10 | Disk Reference: 454001 |
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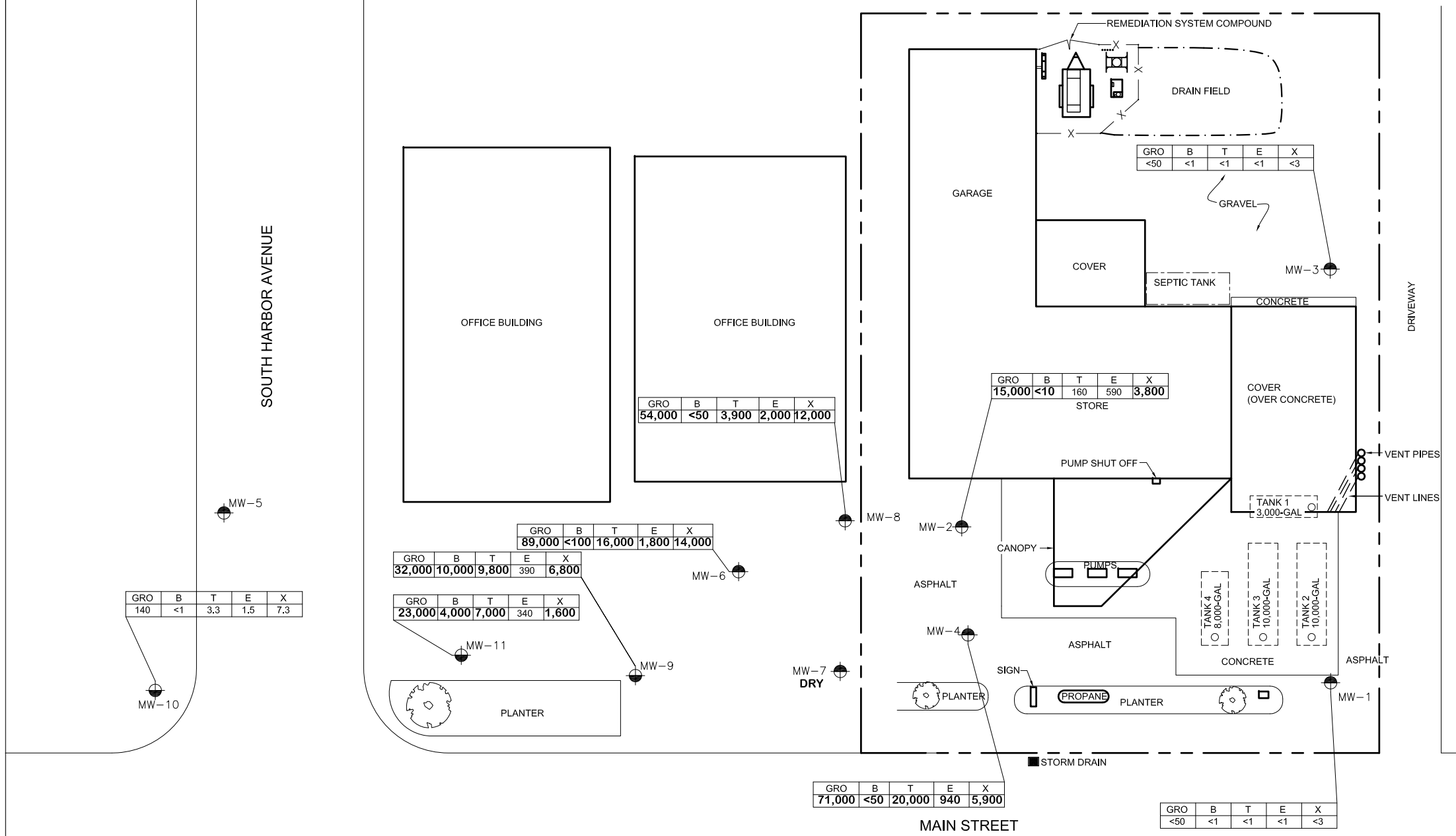


LEGEND

- PERCHED ZONE MONITORING WELL
- SEA LEVEL AQUIFER MONITORING WELL
- SITE BOUNDARY
- UNDERGROUND STORAGE TANK
- TREE

ALL GROUNDWATER ANALYTICAL RESULTS IN MICROGRAMS PER LITER

GRO = TOTAL PETROLEUM HYDROCARBONS (TPH) AS GASOLINE-RANGE ORGANICS
B = BENZENE
T = TOLUENE
E = ETHYLBENZENE
X = TOTAL XYLENES

**BOLD** = INDICATES CONCENTRATIONS EXCEED WASHINGTON STATE MODEL TOXICS CONTROL ACT CLEANUP REGULATION METHOD A CLEANUP LEVELS

< = INDICATES CONCENTRATIONS NOT DETECTED ABOVE THE STATED LABORATORY PRACTICAL QUANTITATION LIMIT

NOTE: SURVEYED ELEVATION RELATIVE TO MEAN SEA LEVEL

0 30

APPROXIMATE SCALE IN FEET

# FIGURE 5

SITE PLAN SHOWING
GROUNDWATER ANALYTICAL RESULTS
FEBRUARY 2010
WHIDBEY MARINE & AUTO SUPPLY
FREELAND, WASHINGTON

FARALLON PN: 454-001

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Issaquah, WA 98027

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**Table 1**
**Groundwater Elevation Data**
**Whidbey Marine & Auto Supply**
**Freeland, Washington**
**Farallon PN: 454-001**

| Well Identification | Date | Top of Well Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Groundwater Elevation (feet)[1] |
|---|---|---|---|---|
| MW-1[3] | 12/5/05 | 116.64 | 52.54 | 64.10 |
| | 6/7/06 | 116.45 | 52.67 | 63.78 |
| | 10/9/06 | | 51.93 | 64.52 |
| | 1/9/07 | | 51.80 | 64.65 |
| | 3/27/07 | | 51.50 | 64.95 |
| | 6/19/07 | | 51.66 | 64.79 |
| | 12/7/07 | | 51.98 | 64.47 |
| | 4/17/08 | | 51.10 | 65.35 |
| | 6/30/08 | | 51.24 | 65.21 |
| | 8/14/08 | | 51.36 | 65.09 |
| | 9/9/08 | | 51.45 | 65.00 |
| | 10/21/08 | | 51.63 | 64.82 |
| | 1/15/09 | | 51.63 | 64.82 |
| | 5/12/09 | | 51.29 | 65.16 |
| | 8/5/09 | | 51.46 | 64.99 |
| | 2/10/10 | | 51.13 | 65.32 |
| MW-2 | 12/5/05 | 117.49 | 55.06 | 62.43 |
| | 6/7/06 | | 55.56 | 61.93 |
| | 10/9/06 | | 54.69 | 62.80 |
| | 1/9/07 | | 54.60 | 62.89 |
| | 3/27/07 | | 54.44 | 63.05 |
| | 6/19/07 | | 54.50 | 62.99 |
| | 12/7/07 | | 54.81 | 62.68 |
| | 4/17/08 | | 54.06 | 63.43 |
| | 6/30/08 | | 54.12 | 63.37 |
| | 8/14/08 | | 54.21 | 63.28 |
| | 9/9/08 | | 54.26 | 63.23 |
| | 10/21/08 | | 54.44 | 63.05 |
| | 1/15/09 | | 54.40 | 63.09 |
| | 5/12/09 | | 54.08 | 63.41 |
| | 8/5/09 | | 54.19 | 63.30 |
| | 2/10/10 | | 53.92 | 63.57 |

**Table 1**
**Groundwater Elevation Data**
**Whidbey Marine & Auto Supply**
**Freeland, Washington**
**Farallon PN: 454-001**

| Well Identification | Date | Top of Well Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Groundwater Elevation (feet)[1] |
|---|---|---|---|---|
| MW-3 | 12/5/05 | 117.47 | 53.48 | 63.99 |
| | 6/7/06 | | 53.96 | 63.51 |
| | 10/9/06 | | 53.26 | 64.21 |
| | 1/9/07 | | 53.02 | 64.45 |
| | 3/27/07 | | 52.82 | 64.65 |
| | 6/19/07 | | 52.70 | 64.77 |
| | 12/7/07 | | 53.33 | 64.14 |
| | 4/17/08 | | 52.50 | 64.97 |
| | 6/30/08 | | 52.66 | 64.81 |
| | 8/14/08 | | 52.76 | 64.71 |
| | 9/9/08 | | 52.84 | 64.63 |
| | 10/21/08 | | 52.99 | 64.48 |
| | 1/15/09 | | 53.01 | 64.46 |
| | 5/12/09 | | 52.64 | 64.83 |
| | 8/5/09 | | 52.79 | 64.68 |
| | 2/10/10 | | 52.50 | 64.97 |
| MW-4 | 3/27/07 | 117.27 | 53.94 | 63.33 |
| | 6/19/07 | | 54.02 | 63.25 |
| | 12/7/07 | | 54.28 | 62.99 |
| | 4/17/08 | | 53.58 | 63.69 |
| | 6/30/08 | | 53.64 | 63.63 |
| | 8/14/08 | | 53.71 | 63.56 |
| | 9/9/08 | | 53.76 | 63.51 |
| | 10/21/08 | | 53.89 | 63.38 |
| | 1/15/09 | | 53.88 | 63.39 |
| | 5/12/09 | | 53.50 | 63.77 |
| | 8/5/09 | | 53.65 | 63.62 |
| | 2/10/10 | | 53.44 | 63.83 |
| MW-6 | 4/17/08 | 116.56 | 59.84 | 56.72 |
| | 6/30/08 | | 60.07 | 56.49 |
| | 8/14/08 | | 60.26 | 56.30 |
| | 9/9/08 | | 60.35 | 56.21 |
| | 10/21/08 | | 60.47 | 56.09 |
| | 1/15/09 | | 60.50 | 56.06 |
| | 5/12/09 | | 60.34 | 56.22 |
| | 8/5/09 | | 60.49 | 56.07 |
| | 2/10/10 | | 59.43 | 57.13 |

**Table 1**
**Groundwater Elevation Data**
**Whidbey Marine & Auto Supply**
**Freeland, Washington**
**Farallon PN: 454-001**

| Well Identification | Date | Top of Well Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Groundwater Elevation (feet)[1] |
|---|---|---|---|---|
| MW-7 | 4/17/08 | 116.82 | 56.98 | 59.84 |
| | 6/30/08 | | 57.42 | 59.40 |
| | 8/14/08 | | 57.87 | 58.95 |
| | 9/9/08 | | 58.25 | 58.57 |
| | 10/21/08 | | 58.34 | 58.48 |
| | 1/15/09 | | DRY | DRY |
| | 5/12/09 | | 57.43 | 59.39 |
| | 8/5/09 | | 58.32 | 58.50 |
| | 2/10/10 | | 58.24 | 58.58 |
| MW-8 | 4/17/08 | 117.23 | 55.29 | 61.94 |
| | 6/30/08 | | 55.34 | 61.89 |
| | 8/14/08 | | 55.33 | 61.90 |
| | 9/9/08 | | 55.36 | 61.87 |
| | 10/21/08 | | 55.47 | 61.76 |
| | 1/15/09 | | 55.37 | 61.86 |
| | 5/12/09 | | 55.09 | 62.14 |
| | 8/5/09 | | 55.21 | 62.02 |
| | 2/10/10 | | 54.93 | 62.30 |
| MW-9 | 5/12/09 | 114.79 | 103.54 | 11.25 |
| | 8/5/09 | | 103.85 | 10.94 |
| | 2/10/10 | | 103.79 | 11.00 |
| MW-10 | 5/12/09 | 113.45 | 102.02 | 11.43 |
| | 8/5/09 | | 102.29 | 11.16 |
| | 2/10/10 | | 102.25 | 11.20 |
| MW-11 | 5/12/09 | 114.24 | 102.82 | 11.42 |
| | 8/5/09 | | 103.09 | 11.15 |
| | 2/10/10 | | 103.09 | 11.15 |
| MW-12 | 5/12/09 | 114.23 | 103.96 | 10.27 |
| | 8/5/09 | | 103.24 | 10.99 |
| | 2/10/10 | | 103.36 | 10.87 |

NOTES:

[1]Feet above mean sea level, based on May 2008 survey data.

[2]Feet below top of well casing.

[3]Top of well casing elevation adjusted using change in total depth measurements before and after change in well casing length following soil vapor extraction system installation.

**Table 2**
**Summary of Laboratory Analytical Results for GRO and BTEX in Groundwater Samples**
**Whidbey Marine & Auto Supply**
**Freeland, Washington**
**Farallon PN: 454-001**

| Sample Location | Sample Identification | Sample Date | Analytical Results (micrograms per liter) | | | | |
|---|---|---|---|---|---|---|---|
| | | | GRO[1] | Benzene[2] | Toluene[2] | Ethylbenzene[2] | Xylenes[2] |
| MW-1 | MW1-120505 | 12/5/05 | **4,200** | **480** | 770 | 65 | 318 |
| | MW1-060706 | 6/7/06 | **5,800** | **500** | 1,000 | 70 | 780 |
| | MW-1-100906 | 10/9/06 | **17,000** | **2,400** | **3,800** | 270 | **2,200** |
| | MW1-010907 | 1/9/07 | **1,500** | **14** | 6 | 11 | 120 |
| | QA/QC-010907 | 1/9/07 | **1,500** | **11** | 6 | 10 | 110 |
| | MW1-032707 | 3/27/07 | 290 | 1 | 1 | <1 | 17 |
| | QA/QC-032707 | 3/27/07 | 320 | 1 | <1 | <1 | 19 |
| | MW1-061907 | 6/19/07 | 73 | <1 | <1 | <1 | <3 |
| | MW1-120707 | 12/7/07 | 110 | <1 | <1 | <1 | <3 |
| | MW1-041808 | 4/18/08 | 74 | <1 | <1 | <1 | <3 |
| | MW1-090908 | 9/9/08 | 68 | <1 | <1 | <1 | <3 |
| | MW1-051409 | 5/14/09 | <50 | <1 | <1 | <1 | <3 |
| | MW1-021110 | 2/11/10 | <50 | <1 | <1 | <1 | <3 |
| MW-2 | MW2-120505 | 12/5/05 | 570 | **110** | 110 | 2.8 | 50 |
| | MW2-060706 | 6/7/06 | **2,800** | **440** | 540 | 15 | 430 |
| | MW2-100906 | 10/9/06 | 370 | **20** | 44 | 1 | 77 |
| | MW2-010907 | 1/9/07 | 730 | **35** | 69 | 11 | 150 |
| | MW2-032707 | 3/27/07 | 610 | **6** | 9 | <1 | 150 |
| | MW2-061907 | 6/19/07 | **1,000** | **17** | 52 | 22 | 200 |
| | MW2-120707 | 12/7/07 | **2,300** | **7** | 310 | 36 | 270 |
| | MW2-041808 | 4/18/08 | **3,700** | <1 | 57 | 33 | 890 |
| | MW2-090908 | 9/9/08 | **20,000** | **<50** | **3,100** | 470 | **4,200** |
| | MW2-051309 | 5/13/09 | **4,300** | <5 | 380 | 130 | **1,100** |
| | MW2-021110 | 2/11/10 | **15,000** | **<10** | 160 | 590 | **3,800** |
| MW-3 | MW3-120505 | 12/5/05 | <100 | <1.0 | <1.0 | <1.0 | <2.0 |
| | FD-120505 | 12/5/05 | <100 | <1.0 | <1.0 | <1.0 | <2.0 |
| | MW3-060706 | 6/7/06 | <50 | <1 | <1 | <1 | <3 |
| | MW3-100906 | 10/9/06 | <50 | <1 | <1 | <1 | <3 |
| | MW3-010907 | 1/9/07 | <50 | <1 | <1 | <1 | <3 |
| | MW3-032707 | 3/27/07 | <50 | <1 | <1 | <1 | <3 |
| | MW3-061907 | 6/19/07 | <50 | <1 | <1 | <1 | <3 |
| | QA/QC-061907 | 6/19/07 | <50 | <1 | <1 | <1 | <3 |
| | MW3-120707 | 12/7/07 | <50 | <1 | <1 | <1 | <3 |
| | MW3-041808 | 4/18/08 | <50 | <1 | <1 | <1 | <3 |
| | MW3-090908 | 9/9/08 | <50 | <1 | <1 | <1 | <3 |
| | MW3-051409 | 5/14/09 | <50 | <1 | <1 | <1 | <3 |
| | MW3-021110 | 2/11/10 | <50 | <1 | <1 | <1 | <3 |
| **MTCA Method A Cleanup Levels for Groundwater[3]** | | | **800** | **5** | **1,000** | **700** | **1,000** |

**Table 2**
**Summary of Laboratory Analytical Results for GRO and BTEX in Groundwater Samples**
**Whidbey Marine & Auto Supply**
**Freeland, Washington**
**Farallon PN: 454-001**

| Sample Location | Sample Identification | Sample Date | Analytical Results (micrograms per liter) | | | | |
|---|---|---|---|---|---|---|---|
| | | | GRO[1] | Benzene[2] | Toluene[2] | Ethylbenzene[2] | Xylenes[2] |
| MW-4 | MW4-032707 | 3/27/07 | **99,000** | **31,000** | **32,000** | **970** | **6,000** |
| | MW4-061907 | 6/19/07 | **110,000** | **22,000** | **36,000** | **1,600** | **8,200** |
| | MW4-120707 | 12/7/07 | **39,000** | **7,600** | **12,000** | 300 | **2,400** |
| | QA/QC-120707 | 12/7/07 | **60,000** | **9,500** | **18,000** | **710** | **4,700** |
| | MW4-041808 | 4/18/08 | **140,000** | **530** | **42,000** | **1,600** | **9,400** |
| | MW4-090908 | 9/9/08 | **120,000** | **150** | **40,000** | **2,000** | **11,000** |
| | QA/QC-1-090908 | 9/9/08 | **120,000** | **150** | **43,000** | **1,900** | **11,000** |
| | MW4-051409 | 5/14/09 | **83,000** | **<50** | **30,000** | **1,100** | **6,600** |
| | MW4-021110 | 2/11/10 | **71,000** | **<50** | **20,000** | **940** | **5,900** |
| MW-6 | MW6-041708 | 4/18/08 | **23,000** | **260** | **1,500** | 530 | **3,600** |
| | MW6-090908 | 9/9/08 | **42,000** | **450** | **8,500** | **1,300** | **7,800** |
| | MW6-051409 | 5/14/09 | **17,000** | **29** | **3,200** | 250 | **3,100** |
| | MW6-021110 | 2/11/10 | **89,000** | **<100** | **16,000** | **1,800** | **14,000** |
| MW-7 | MW7-041808 | 4/18/08 | **54,000** | **13,000** | **17,000** | 420 | **3,700** |
| | MW7-051409 | 5/14/09 | **13,000** | **2,500** | **3,700** | 180 | **1,700** |
| MW-8 | MW8-041808 | 4/18/08 | **5,400** | <1 | 57 | 57 | 890 |
| | QA/QC-1-041808 | 4/18/08 | **5,600** | <1 | 42 | 55 | 930 |
| | MW8-090908 | 9/9/08 | **34,000** | **<50** | **3,500** | 670 | **6,700** |
| | MW8-051309 | 5/13/09 | **60,000** | **<50** | **9,000** | **1,800** | **9,500** |
| | QA/QC-051309 | 5/13/09 | **57,000** | **<50** | **8,900** | **1,700** | **9,400** |
| | MW8-021110 | 2/11/10 | **54,000** | **<50** | **3,900** | **2,000** | **12,000** |
| MW-9 | MW9-051309 | 5/13/09 | **94,000** | **18,000** | **32,000** | **1,500** | **7,600** |
| | MW9-021010 | 2/10/10 | **32,000** | **10,000** | **9,800** | 390 | **1,800** |
| MW-10 | MW10-051309 | 5/13/09 | <50 | <1 | 2 | <1 | <3 |
| | MW10-021010 | 2/10/10 | 140 | <1 | 3.3 | 1.5 | 7.3 |
| MW-11 | MW11-051309 | 5/13/09 | **2,300** | **500** | 530 | 19 | 230 |
| | MW11-021010 | 2/10/10 | **23,000** | **4,000** | **7,000** | 340 | **1,600** |
| MW-12 | MW12-051309 | 5/13/09 | **55,000** | **200** | **8,900** | **1,700** | **9,700** |
| | MW12-021010 | 2/10/10 | **52,000** | **92** | **3,900** | **1,300** | **8,400** |
| **MTCA Method A Cleanup Levels for Groundwater[3]** | | | **800** | **5** | **1,000** | **700** | **1,000** |

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

Results in **bold** denote concentrations or laboratory reporting limits above applicable cleanup levels.

BTEX = benzene, toluene, ethylbenzene, and xylenes
GRO = total petroleum hydrocarbons as gasoline-range organics

[1]Analyzed by Northwest Method NWTPH-Gx.

[2]Analyzed by U.S. Environmental Protection Agency Method 8021B.

[3]Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised November 2007.

# Table 3
# Summary of Laboratory Analytical Results for DRO and ORO in Groundwater Samples
# Whidbey Marine & Auto Supply
# Freeland, Washington
# Farallon PN: 454-001

| Sample Location | Sample Identification | Sample Date | Analytical Results (micrograms per liter)[1] | |
|---|---|---|---|---|
| | | | DRO | ORO |
| MW-4 | MW4-051409 | 5/14/2009 | **680**[2] | <250 |
| MW-9 | MW9-051309 | 5/13/2009 | **800**[2] | <250 |
| MW-10 | MW10-051309 | 5/13/2009 | <130 | <250 |
| MW-11 | MW11-051309 | 5/13/2009 | <130 | <250 |
| MW-12 | MW12-051309 | 5/13/2009 | **<1,300**[3] | <250 |
| | MW12-021010 | 2/10/2010 | **2,600**[2] | 310 |
| **MTCA Method A Cleanup Levels for Groundwater**[4] | | | **500** | **500** |

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

Results in **bold** denote concentrations or laboratory reporting limits above applicable cleanup levels.

[1]Analyzed by Northwest Method NWTPH-Dx.

[2]DRO result is being influenced by the presence of GRO.

[3]Laboratory reporting limit for DRO is being influenced by the presence of GRO.

[4]Washington State Model Toxics Control Act Cleanup Regulation Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised November 2007.

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

GRO = TPH as gasoline-range organics

ORO = TPH as oil-range organics

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ANALYTICAL CHEMISTRY & TESTING SERVICES

# CERTIFICATE OF ANALYSIS

CLIENT: Farallon Consulting
1201 Cornwall Ave. #105
Bellingham, WA 98225

DATE: 2/17/2010
ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/11/2010 MW1-021110
ALS SAMPLE #: -01

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | ND | 50 | 1 | UG/L | 2/12/2010 | DLC |
| Benzene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/12/2010 | DLC |
| Toluene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/12/2010 | DLC |
| Ethylbenzene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/12/2010 | DLC |
| Xylenes | EPA-8021 | ND | 3.0 | 1 | UG/L | 2/12/2010 | DLC |

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMT.
** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

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Bellingham, WA 98225

DATE: 2/17/2010
ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/11/2010 MW2-021110
ALS SAMPLE #: -02

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 15,000 | 500 | 10 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | ND | 10 | 10 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 160 | 10 | 10 | UG/L | 2/15/2010 | DLC |
| Ethylbenzene | EPA-8021 | 590 | 10 | 10 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 3,800 | 30 | 10 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains weathered gasoline.

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ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/11/2010 MW3-021110
ALS SAMPLE #: -03

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | ND | 50 | 1 | UG/L | 2/12/2010 | DLC |
| Benzene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/12/2010 | DLC |
| Toluene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/12/2010 | DLC |
| Ethylbenzene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/12/2010 | DLC |
| Xylenes | EPA-8021 | ND | 3.0 | 1 | UG/L | 2/12/2010 | DLC |

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DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/11/2010 MW4-021110
ALS SAMPLE #: -04

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 71,000 | 2,500 | 50 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | ND | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 20,000 | 200 | 200 | UG/L | 2/16/2010 | DLC |
| Ethylbenzene | EPA-8021 | 940 | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 5,900 | 150 | 50 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline.

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DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/11/2010 MW6-021110
ALS SAMPLE #: -05

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 89,000 | 5,000 | 100 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | ND | 100 | 100 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 16,000 | 100 | 100 | UG/L | 2/15/2010 | DLC |
| Ethylbenzene | EPA-8021 | 1,800 | 100 | 100 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 14,000 | 300 | 100 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline.

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ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/11/2010 MW8-021110
ALS SAMPLE #: -06

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 54,000 | 2,500 | 50 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | ND | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 3,900 | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Ethylbenzene | EPA-8021 | 2,000 | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 12,000 | 150 | 50 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline.

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DATE: 2/17/2010
ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/10/2010 MW9-021010
ALS SAMPLE #: -07

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 32,000 | 1,200 | 25 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | 10,000 | 100 | 100 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 9,800 | 100 | 100 | UG/L | 2/15/2010 | DLC |
| Ethylbenzene | EPA-8021 | 390 | 25 | 25 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 1,800 | 75 | 25 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline.

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Bellingham, WA 98225

DATE: 2/17/2010
ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/10/2010 MW10-021010
ALS SAMPLE #: -08

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 140 | 50 | 1 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | ND | 1.0 | 1 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 3.3 | 1.0 | 1 | UG/L | 2/15/2010 | DLC |
| Ethylbenzene | EPA-8021 | 1.5 | 1.0 | 1 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 7.3 | 3.0 | 1 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline.

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** UNITS FOR ALL NON-LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS.

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Bellingham, WA 98225

DATE: 2/17/2010
ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/10/2010 MW11-021010
ALS SAMPLE #: -09

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 23,000 | 1,200 | 25 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | 4,000 | 25 | 25 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 7,000 | 50 | 50 | UG/L | 2/16/2010 | DLC |
| Ethylbenzene | EPA-8021 | 340 | 25 | 25 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 1,600 | 75 | 25 | UG/L | 2/15/2010 | DLC |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline.

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1201 Cornwall Ave. #105
Bellingham, WA 98225

DATE: 2/17/2010
ALS JOB#: 1002052
DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001
CLIENT SAMPLE ID: 2/10/2010 MW12-021010
ALS SAMPLE #: -10

## DATA RESULTS

| ANALYTE | METHOD | RESULTS* | REPORTING LIMITS | DILUTION FACTOR | UNITS** | ANALYSIS DATE | ANALYSIS BY |
|---|---|---|---|---|---|---|---|
| TPH-Volatile Range | NWTPH-GX | 52,000 | 2,500 | 50 | UG/L | 2/15/2010 | DLC |
| Benzene | EPA-8021 | 92 | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Toluene | EPA-8021 | 3,900 | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Ethylbenzene | EPA-8021 | 1,300 | 50 | 50 | UG/L | 2/15/2010 | DLC |
| Xylenes | EPA-8021 | 8,400 | 150 | 50 | UG/L | 2/15/2010 | DLC |
| TPH-Diesel Range | NWTPH-DX | 2,600 | 130 | 1 | UG/L | 2/11/2010 | EBS |
| TPH-Oil Range | NWTPH-DX | 310 | 250 | 1 | UG/L | 2/11/2010 | EBS |

Chromatogram indicates that it is likely that sample contains lightly weathered gasoline, diesel and lube oil. Diesel range product results biased high due to gasoline range product overlap.

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WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001

## QUALITY CONTROL RESULTS

### SURROGATE RECOVERY

| ALS SAMPLE ID | METHOD | SUR ID | % RECV |
|---|---|---|---|
| 1002052-01 | NWTPH-GX | TFT | 90% |
| 1002052-01 | EPA-8021 | TFT | 83% |
| 1002052-02 10X Dilution | NWTPH-GX | TFT | 114% |
| 1002052-02 10X Dilution | EPA-8021 | TFT | 100% |
| 1002052-03 | NWTPH-GX | TFT | 99% |
| 1002052-03 | EPA-8021 | TFT | 91% |
| 1002052-04 50X Dilution | NWTPH-GX | TFT | 102% |
| 1002052-04 200X Dilution | EPA-8021 | TFT | 91% |
| 1002052-04 50X Dilution | EPA-8021 | TFT | 94% |
| 1002052-05 100X Dilution | NWTPH-GX | TFT | 104% |
| 1002052-05 100X Dilution | EPA-8021 | TFT | 95% |
| 1002052-06 50X Dilution | NWTPH-GX | TFT | 109% |
| 1002052-06 50X Dilution | EPA-8021 | TFT | 103% |
| 1002052-07 25X Dilution | NWTPH-GX | TFT | 114% |
| 1002052-07 100X Dilution | EPA-8021 | TFT | 100% |
| 1002052-07 25X Dilution | EPA-8021 | TFT | 94% |
| 1002052-08 | NWTPH-GX | TFT | 106% |
| 1002052-08 | EPA-8021 | TFT | 99% |
| 1002052-09 25X Dilution | NWTPH-GX | TFT | 97% |
| 1002052-09 25X Dilution | EPA-8021 | TFT | 88% |
| 1002052-09 50X Dilution | EPA-8021 | TFT | 107% |
| 1002052-10 50X Dilution | NWTPH-GX | TFT | 109% |
| 1002052-10 50X Dilution | EPA-8021 | TFT | 96% |
| 1002052-10 | NWTPH-DX | C25 | 101% |

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DATE: 2/17/2010
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DATE RECEIVED: 2/11/2010
WDOE ACCREDITATION #: C1336

CLIENT CONTACT: Paul Grabau
CLIENT PROJECT ID: 454-001

## QUALITY CONTROL RESULTS

**BLANK RESULTS**

| QC SAMPLE ID | MATRIX | METHOD | ANALYTE | RESULT | UNITS |
|---|---|---|---|---|---|
| MBG-021110W | Water | NWTPH-GX | TPH-Volatile Range | ND(<50) | UG/L |
| MB-021110W | Water | EPA-8021 | Benzene | ND(<1.0) | UG/L |
| MB-021110W | Water | EPA-8021 | Toluene | ND(<1.0) | UG/L |
| MB-021110W | Water | EPA-8021 | Ethylbenzene | ND(<1.0) | UG/L |
| MB-021110W | Water | EPA-8021 | Xylenes | ND(<3.0) | UG/L |
| MB-021110W | Water | NWTPH-DX | TPH-Diesel Range | ND(<130) | UG/L |
| MB-021110W | Water | NWTPH-DX | TPH-Oil Range | ND(<250) | UG/L |

APPROVED BY:



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## CERTIFICATE OF ANALYSIS

CLIENT: Farallon Consulting
1201 Cornwall Ave. #105
Bellingham, WA 98225

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## QUALITY CONTROL RESULTS

**BLANK SPIKE/BLANK SPIKE DUPLICATE RESULTS**

| QC BATCH ID | MATRIX | METHOD | ANALYTE | SPIKE AMOUNT | BLANK SPIKE RECOVERY | BLANK SPIKE DUPLICATE RECOVERY | RPD |
|---|---|---|---|---|---|---|---|
| 539 | Water | NWTPH-GX | TPH-Volatile Range | 500 | 81% | 83% | 3 |
| 539 | Water | EPA-8021 | Benzene | 20 | 97% | 97% | 1 |
| 539 | Water | EPA-8021 | Toluene | 20 | 96% | 96% | 0 |
| 539 | Water | EPA-8021 | Ethylbenzene | 20 | 95% | 95% | 1 |
| 539 | Water | EPA-8021 | Xylenes | 60 | 98% | 98% | 0 |
| 538 | Water | NWTPH-DX | TPH-Diesel Range | 500 | 94% | 86% | 9 |

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