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November 15, 2016
G-Logics File 01-0410-K

Washington State Department of Ecology, NW Region
Mr. Dale Myers
3190 160th Avenue SE
Bellevue, WA 98008

**Subject: Progress Report, October 15, to November 15, 2016**
**Boeing Field Chevron**
**Ecology Facility-Site ID: 2551**
**Agreed Order: DE-10947**
**10805 East Marginal Way South**
**Tukwila, WA**

Dear Mr. Myers:

This progress memo has been prepared to document the activities that have occurred at the above referenced Site, in regards to the ongoing Remedial Investigation (RI) since October 15, 2016. This Progress Report also is intended to fulfill the reporting requirements established in the Agreed Order (No. DE 10947). Presented below is information for each of the eight Agreed Order Progress Memo topics.

## 1-Actions Taken at the Property to Comply with Agreed Order No. DE 8072

The following actions were recently completed as part of the on-going remedial investigation.

### *Tidal Study*

G-Logics placed eight pressure transducers in groundwater monitoring wells across the Site. Locations were selected in order to capture tidal influence in the existing monitoring well network. Of the eight locations, three of the wells are understood to be screened in a shallow water-bearing zone (wells MW-18, IP-4, and MW-12). Wells MW-19, MW-21, and

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IP-3 are understood to be screened in the deeper water-bearing zone. Wells MW-13 and MW-14 are understood to be screened across both water-bearing zones.

The transducers recorded water-level measurements every two minutes for a period of one week from October 12, 2016 to October 19, 2016. The data collected during this study is summarized on draft versions of Graph 1 and Figure A. Graph 1 depicts the groundwater elevation variations in each well compared to tidal measurements recorded at the Duwamish Waterway gauging station (Eighth Ave. South, Station Id: 9447029).

### *Soil Borings*

G-Logics drilled 16 soil borings to depths ranging from 25 to 35 feet below the ground surface. Boring locations are shown on Figure B. Each boring was air-knifed/vacuum excavated to a depth of six feet to clear shallow utilities.

### *Installation of Soil-Vapor Monitoring Points*

G-Logics installed two soil-gas sampling points on the south side of the property, specifically GLVP-1 and GLVP-2 (Figure B).

### *Catch Basin-Sediment and Stormwater Sampling*

On Monday, October 3rd, G-Logics attempted to sample catch-basin sediments along the eastern curb of Pacific Highway South (western boundary of the subject property). The basins were found to contain approximately 1 foot of standing water with abundant leaf and garbage debris. Sediment was not encountered in sufficient quantities to sample. G-Logics returned to the Site on October 27th, 2016 for a second attempt to sample catch basin sediments and stormwater. With the October 27th sampling effort, G-Logics was able to obtain stormwater samples from catch-basins CB-1001, CB-1002, CB-5, and CH-1068. G-Logics also was able to obtain sediment samples from CB-1002 and CB-1068. The locations of sampled catch-basins are shown on Figure C.

### *Remedial Investigation Report Preparations*

G-Logics continues to compile and update analytical data in summary Tables, prepare Figures, and generate cross-section diagrams that will be used in the RI report. Updated Tables and Figures also will be used to assist in planning and decision making during the RI field activities.

### *IDW Disposal*

All drums on the property containing either IDW or product-recovery are scheduled for disposal on Wednesday, November 16, 2016 (a total of 10 drums).

### *Site Signage*

The Site Poster Board (sign) installation was completed on November 3, 2016. This included the installation of four Flyer Boxes, which contain flyers printed in English, Spanish, Korean, and Chinese.

## 2-Summary of Sampling and Testing Reports

Analytical results from soil samples collected during the recent exploration show that Site contaminants do not extend to the exploration locations in the median on Tukwila International Blvd, west of the Property. Specifically, borings GLB-1 through GLB-4 did not contain detectable concentrations of Site contaminants. Likewise, analyzed soil samples from borings GLB-5, GLB-6, and GLB-11 did not report detectable concentrations of Site contaminants, understood to confirm the extent of the Site boundaries in these locations.

Soil samples collected from GLB-12 and GLB-13 did not contain Site contaminants above cleanup levels. Base on these soil results, it appears that the north and northeast Site boundaries have been established. However, Site boundaries to the south, southeast, and east have not been identified and require additional exploration/assessment work (scheduled for November 16, 2016).

A summary of the analytical findings are discussed below, by contaminant.

### *Petroleum Hydrocarbons*

Concentrations of GRO were reported in soil samples collected from seven borings, specifically, GLB-7, 9, 10, 12, 14, 15, and 16. However, only three samples contained concentrations above Method A cleanup levels. Specifically, a sample from GLB-14, collected a depth of 17 feet, reported a concentration of gasoline at 215 mg/kg. Two samples collected from GLB-15, collected at the depths of 12 and 18 feet, reported concentrations of gasoline at 37.2 and 3,510 mg/kg, respectively. Concentrations of DRO and ORO were not detected in any of the analyzed soil samples.

### *Lead*

Lead was not reported above Method A cleanup levels in any of the analyzed samples.

### *Polynuclear Aromatic Hydrocarbons*

Seven soil samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAHs) by EPA Method 8270 (SIM, low-detection). The seven analyzed samples did not contain detectable concentrations of PAHs. These samples were selected based on the detected concentration of gasoline in the initial sample as well as being collected from areas identified for this analysis in the approved workplan.

### *Volatile Organic Compounds*

Eighteen soil samples were analyzed for VOCs by EPA Method 8260C. Analyzed soil samples from GLB-7, 9, 10, 14, 15, and 16 reported concentrations of BTEX and or hexane at concentrations above Method A Cleanup Levels.

### *Naphthalenes*

Eighteen soil samples were analyzed for naphthalene, including 1-methylnaphthalene and 2-methylnaphthalene. Naphthalene and 1-methylnaphthalene exceeded Method A cleanup levels in four of the analyzed samples (collected from two borings, GLB-7 and GLB-15). Concentrations of 2-methylnaphthalene also were reported.

## 3-Summary of Deviations from the Approved Workplans

Deviations from the approved Workplan are described below.

### *Boring Locations and Quantity*

For the initial exploration efforts, G-Logics advanced sixteen-soil borings at the Site, three fewer than the planned nineteen borings. Locations of several boring were adjusted for project efficiency.

### *Groundwater Sampling*

The preliminary results of the tidal study and the soil borings support the interpretation that two discrete water-bearing horizons exist at the Site. Based on this interpretation, some of the existing wells may need to be decommissioned and new wells installed with screen

depths representative of updated hydrogeological interpretation. Accordingly, G-Logics recommends delaying groundwater sampling until new wells are installed (anticipated to occur during the week of November 14, 2016).

***Installation of Soil Vapor Probes***

G-Logics installed two soil-vapor sample points at the southern property boundary. The purpose of this modification is to obtain empirical data, ultimately needed to complete a vapor-intrusion assessment at the subject property.

As stated in Ecology's *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, DRAFT*, dated October 2009, where groundwater is the only vapor-intrusion source, soil-gas samples should be collected from just above the water table's capillary zone. The two sample points were installed within one foot of saturated soil (a depth of 7 feet). Petroleum contaminants were not detected in soil samples collected from 7 feet, however groundwater has yet to be evaluated.

**4-Summary of Contacts with Representatives from Local Community, Public Interest Groups, Press, and Federal, State, and Tribal Governments**

G-Logics met with the Ecology project manager (Mr. Dale Myers) and with Ecology's consultant (Kennedy/Jenks, Ms. Julia Schwarz) on November 9, 2016 to discuss the project, tasks completed to date and additionally proposed exploration efforts.

**5-Summary of Problems or Anticipated Problems in Meeting the Schedule or Objectives**

Currently, it is understood that the Site will receive a 30-day extension to complete the RI field activities. At this time, it is believed that the field activities can be completed by the new deadline.

**6-Summary of Solutions Developed and Implemented or Planned to Address Problems**

G-Logics continues to schedule and perform work at the Site. Specifically, a second round of exploration work will begin on November 16, 2016. This work will include the installation of several new groundwater monitoring wells. Following the installation of new groundwater monitoring wells, groundwater will be collected and analyzed from multiple monitoring wells across the Site.

## 7-Changes in Key Personnel

There are no changes in key personnel at this time.

## 8-Description of Work Planned for Next Reporting Period

Before the December 15th report submittal, G-Logics anticipates completing:

- Additional monitoring well installations.
- Site-wide groundwater sampling event (after additional monitoring wells are installed).
- Collection of soil-vapor samples from the recently-installed monitoring points.
- Compile Data and Figures

## Closing

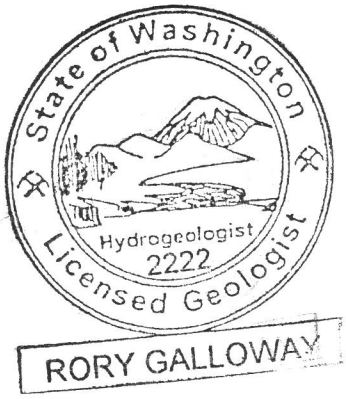
Please contact us at your convenience with any questions regarding our work or findings.

Sincerely,
**G-Logics, Inc.**

Rory L. Galloway, LG, LHG
Principal

Dan Hatch, PMP
Remediation Manager

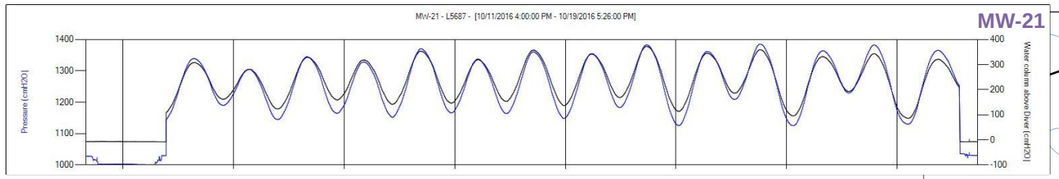
Zackary S. Wall, M.Sc.
Staff Geologist

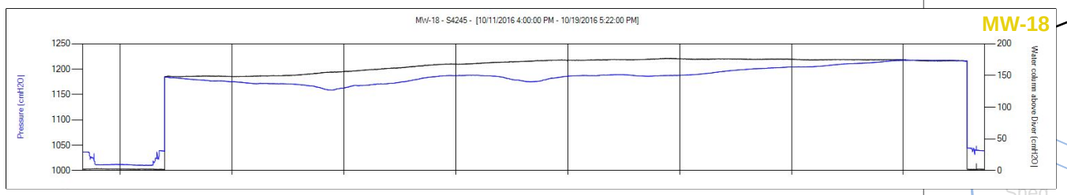


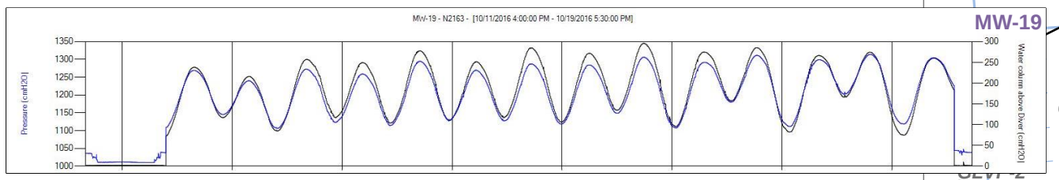

**FIGURES**

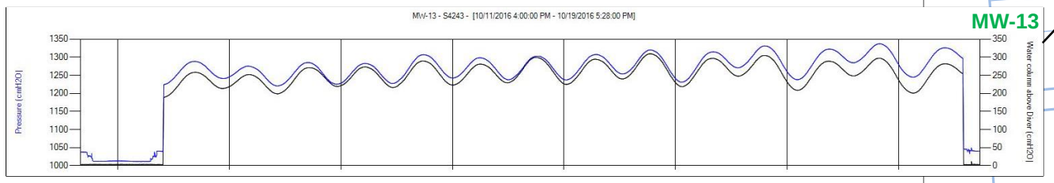
| | |
|---|---|
| Figure A: | 2016 Tidal Study |
| Figure B: | Site Diagram: Historical Features |
| Figure C: | On-Site Stormwater and Sewer Drainage Systems |
| Graph 1: | Tidal Fluctuation in Groundwater Elevation |

# FIGURES



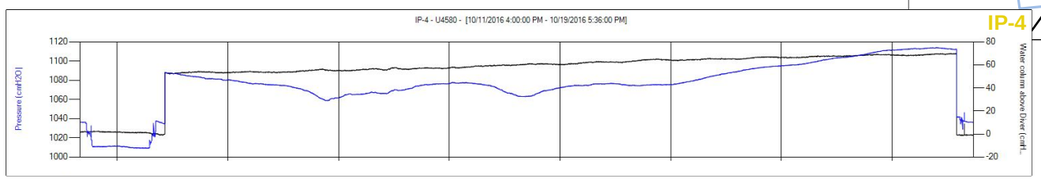



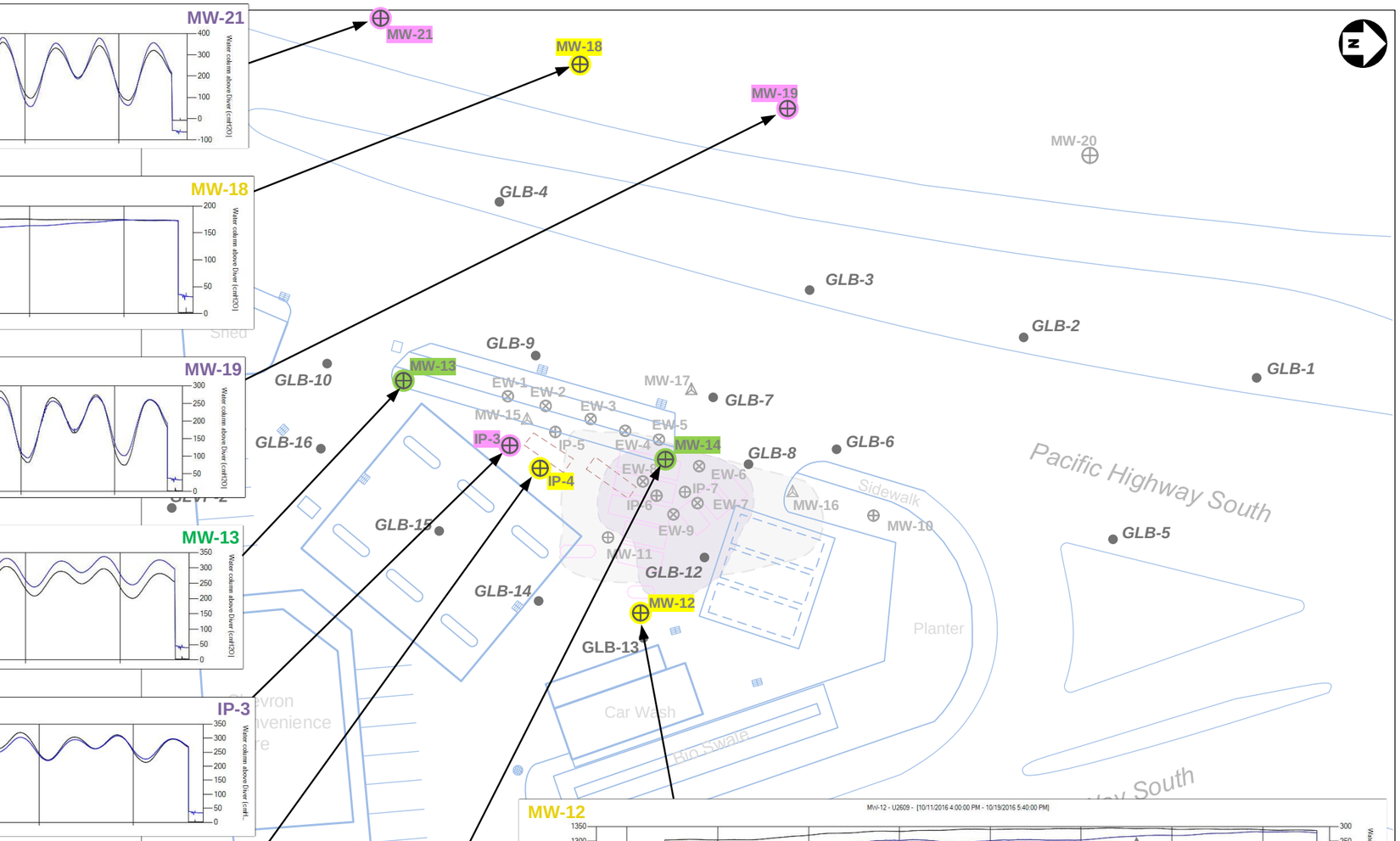



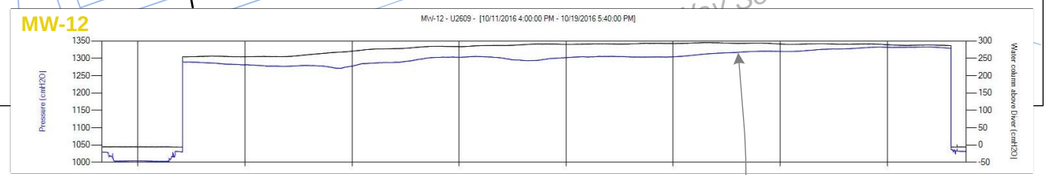



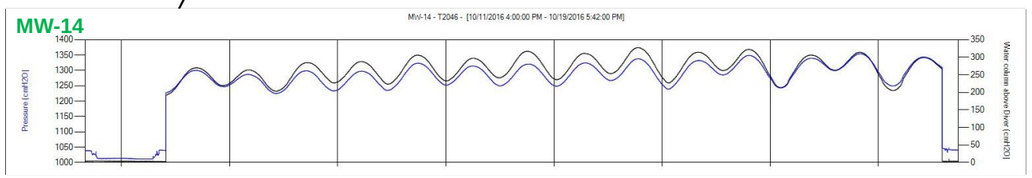







Pressure of Water Column Above Transducer for the Week of 10/11/2016 through 10/19/2016.

Black Line Shows Compensation for Atmospheric Pressure.

MW-21 Pink shading indicates **deep** monitoring well screen (top of screen below 15' depth)

MW-18 Yellow shading indicates **shallow** monitoring well screen (bottom of screen above 16' depth)

MW-13 Green shading indicates well with top of screen placed above 15' and bottom of screen placed below 16' depth

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Approximate Drawing Scale: 1" = 40'

0 ft. 24 ft. 40 ft. 80 ft.

Important Note: This figure contains information in color. Black & white photocopies may not be suitable for review.

***2016 Tidal Study***
***Boeing Field Chevron***
***10805 East Marginal Way South***
***Seattle, Washington***

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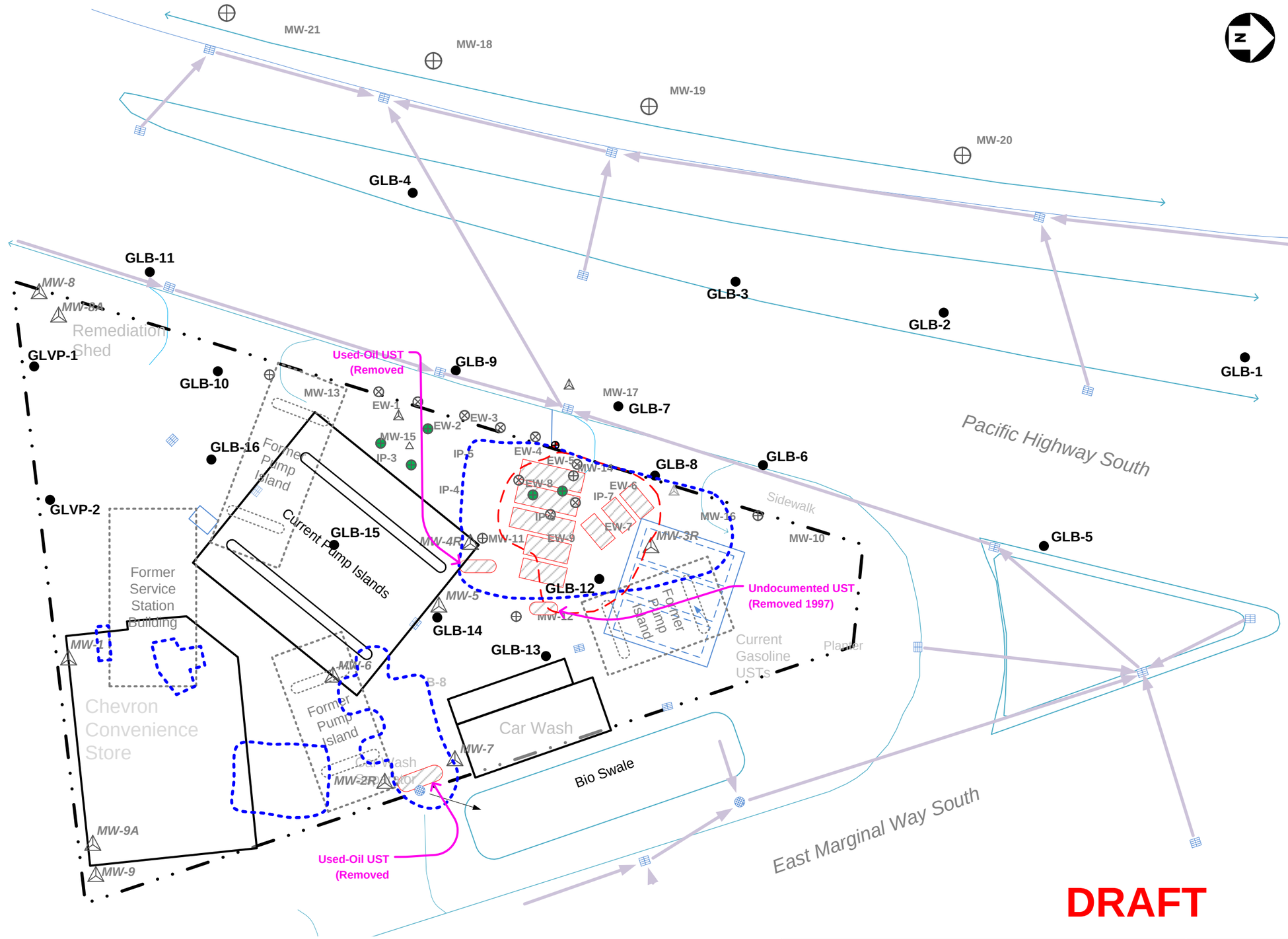
Figure A

*Project File: 01-0410-K Tidal Study Results.vsd*

**Mapping References: Roger Ollenberg (architect) Preconstruction Site Plan 4-8-1996, Hart Crowser 1993, RZA 1990, G-Logics site measurements.**

## Legend

- Understood Property Line
- Approximate Line of Road/Curbing
- MW-12 — Decommissioned Well
- MW-13 — Existing Monitoring Well
- IP-3 — Injection Point/Well
- EW-3 — Extraction Well
- GLB-9 — G-Logics October 2016 Exploration Boring
- Understood Area of Former "Waste Oil" and/or Heating Oil USTs
- Understood Area of Former Fuel USTs
- Approximate Hart Crowser Excavation Area (1990 and 1992)
- Approximate RZA Excavation Area (1990)
- Current UST Nest (3 USTs)

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***Site Diagram, Historical Features***
***Boeing Field Chevron***
***10805 East Marginal Way South***
***Seattle, Washington***

Figure B

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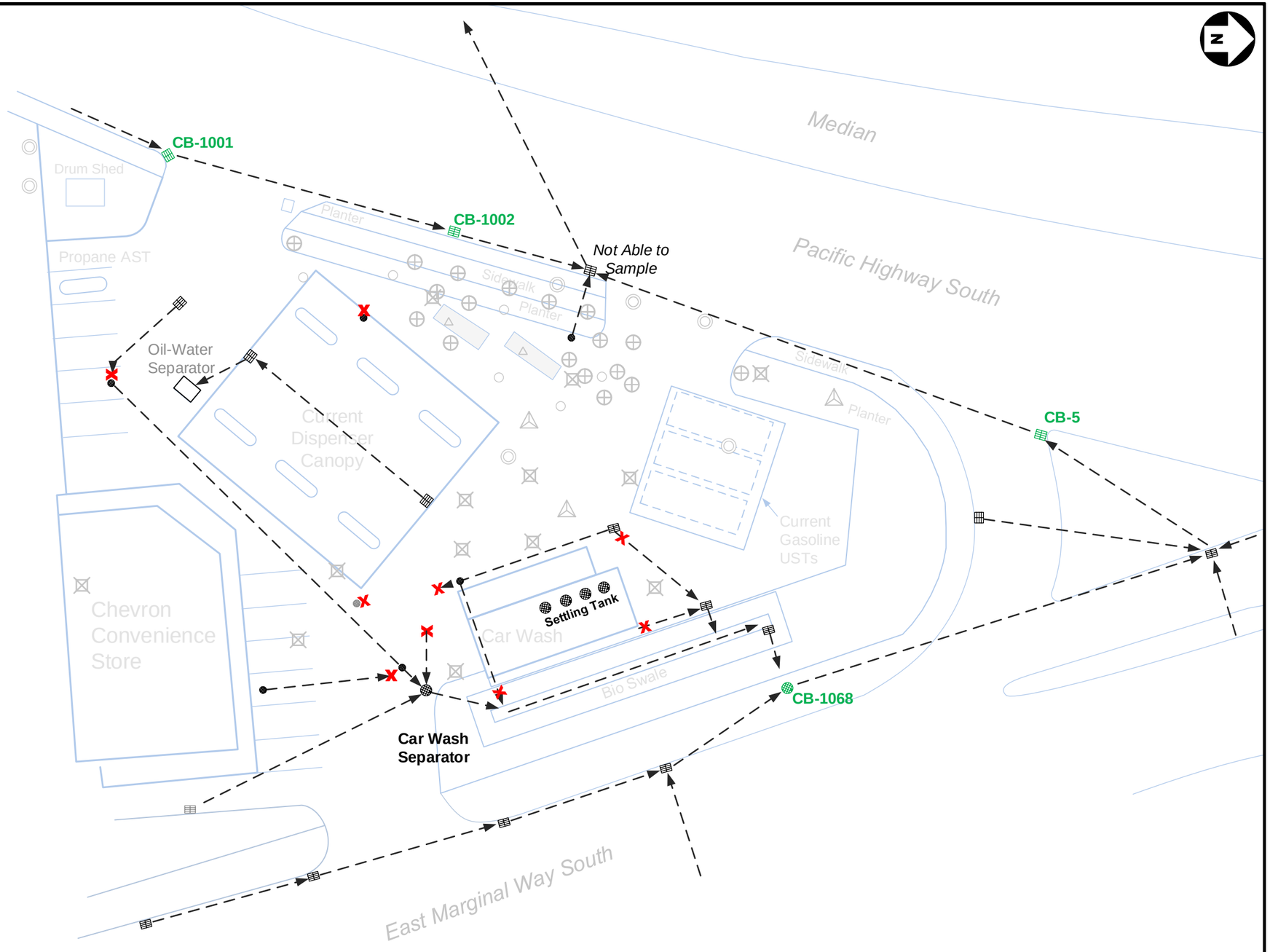
*Project File: 01-0410-K FB Base w-1st Borings & Historical Features.vsd*

Mapping References: Roger Ollenberg (architect) Preconstruction Site Plan 4-8-1996, G-Logics site measurements Jan 20, 2006, Hart Crowser 1993, RZA 1990.

**Legend**

| | |
|---|---|
| B-8 | RZA 1990b |
| B-3 | Hart Crowser 1993b |
| MW-8A | Hart Crowser 1993c |
| *MW-12* | PEG 1997b |
| *MW-13* | ERI 2004b |
| EX-S | Extraction Well 2004 |
| *MW-17* | ERI 2005c |
| IP-3 | G-Logics Injection Point/ Monitoring Well 2006 |
| P-6 | G-Logics Probe 2008c |
| EW-3 | G-Logics Extraction Well/ Monitoring Well (2008) |

- Storm Drain Catch Basin Grate
- Sampled Catch Basin
- Storm/Sewer Clean Out
- Approximate direction and distance of video-inspected utility pipe
- Approximate location of blockage in utility pipe

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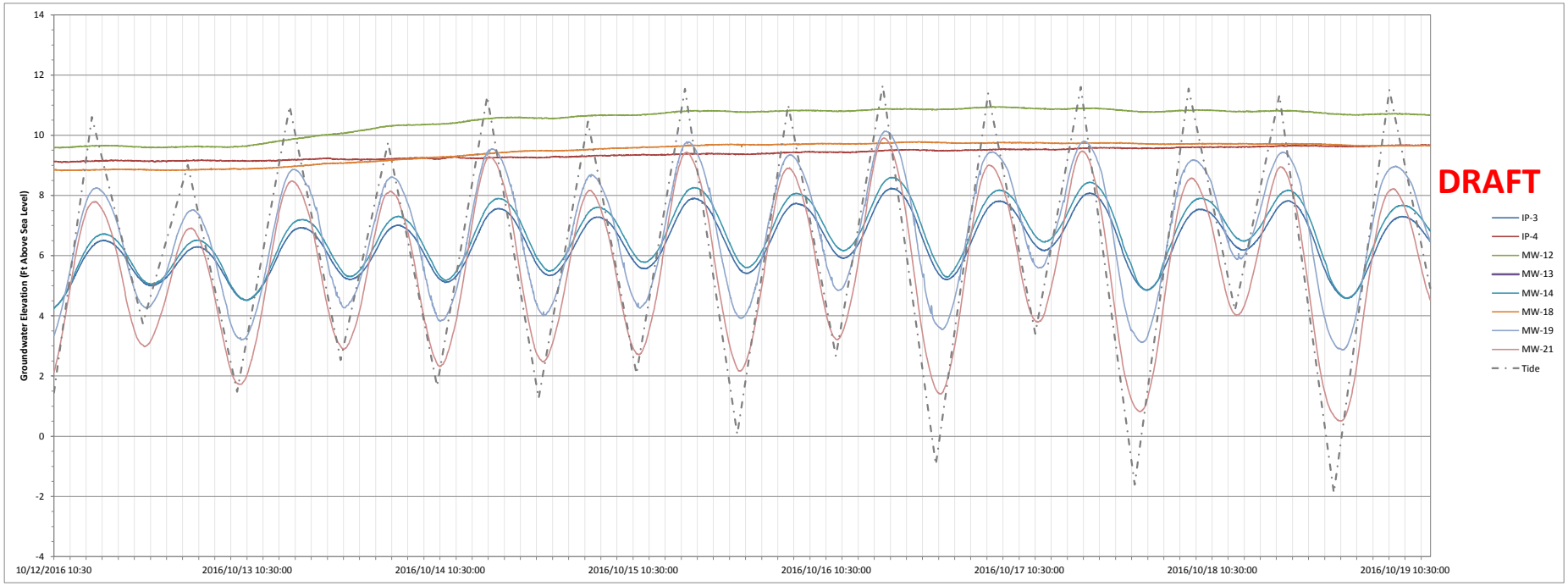
***On-Site Stormwater and Sewer Drainage Systems***
***Boeing Field Chevron***
***10805 East Marginal Way South***
***Seattle, Washington***

Figure C

*Project File: 01-0410-K-Storm and Sewer 30.vsd*

Mapping References: Roger Ollenberg (architect) Preconstruction Site Plan 4-8-1996, G-Logics site measurements.

Graph 1 Tidal Fluctuations in Groundwater Elevation
Boeing Field Chevron
10805 East Marginal Way S
Tukwilla, Washington



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