OFFSHORE INVESTIGATION REPORT

NW NATURAL "GASCO" SITE

Prepared for

NW Natural
220 NW 2nd Avenue
Portland, Oregon 97209

Prepared by

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6650 SW Redwood Land, Suite 333
Portland, Oregon 97224

February 2008

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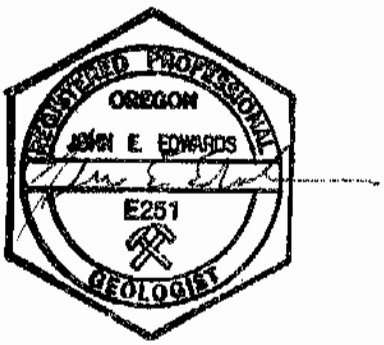

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µg/L	micrograms per liter
ADCP	Acoustic Doppler Current Profiler
AWQC	Ambient Water Quality Criterion
BTEX	benzene, toluene, ethylbenzene, and xylene
CAS	Columbia Analytical Services, Inc
CCC	criterion continuous concentration
cm	centimeter
cm/d	centimeter per day
CMA	Coastal Monitoring Associates
CN-	cyanide anion
COI	Chemical of Interest
COP	City of Portland
DEQ	Oregon Department of Environmental Quality
DOC	dissolved organic carbon
EPA	U.S. Environmental Protection Agency
FSP	Field Sampling Plan
GC/MS	gas chromatograph/mass spectrometer
GMAV	genus mean acute value
GPM	gallons per minute
GPS	global positioning system
HAI	Hahn and Associates Inc.
HCN	hydrogen cyanide
HPAH	high-molecular-weight polycyclic aromatic hydrocarbon
JSCS	Joint Source Control Strategy
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
LDC	Laboratory Data Consultants, Inc.
LWG	Lower Willamette Group
MARP	Monitoring and Reporting Plan
MCL	maximum contaminant level
MDL	method detection limit
mg/L	milligrams per liter
MGP	manufactured gas plant
MRL	method reporting limit

MS/MSD	matrix spike/matrix spike duplicate
MSL	mean sea level
NAPL	non-aqueous phase liquid
NTU	nephelometric turbidity unit
ORP	oxidation reduction potential
PAH	polycyclic aromatic hydrocarbon
PRG	Preliminary Remediation Goal
QA/QC	quality assurance/quality control
RfD	reference dose
RI	Remedial Investigation
Site	NW Natural Gasco Site
SLV	Screening Level Value
SOP	standard operating procedure
SVOC	semi-volatile organic compounds
TOC	total organic carbon
TSS	total suspended solids
TZW	Transition Zone Water
VOC	volatile organic compounds

EXECUTIVE SUMMARY

On behalf of NW Natural, Anchor Environmental L.L.C. (Anchor) conducted a series of investigations in the Willamette River offshore of the NW Natural Gasco Site (Site) during the period from July 2006 to October 2007. This report describes the work completed and findings from those investigations. The investigations included sampling and testing of groundwater, sediments, and river water.

Work Objectives

The primary objectives of the investigations were to assess the following issues:

- Understand how the vertical and lateral extent of chemicals in groundwater beneath the river and transition zone water (TZW) may be related to chemical concentrations measured in upland groundwater.
- Understand how groundwater and TZW concentrations may be related to direct historical deposition of materials in the river.
- Determine if the chemical concentrations in the biologically active TZW in navigation channel sediments have been directly impacted by historical deposition of waste materials in the river.
- Determine the potential variability in measured shallow sediment TZW chemical concentrations due to tidal fluctuations in the Willamette River.
- Provide additional lines of evidence for verifying groundwater discharge and providing general level estimates of groundwater discharge rates within the river sediments adjacent to the Site.
- Evaluate the potential for transport of cyanide measured in Site groundwater and TZW to surface water and any conversion to free cyanide under select river conditions.
- Collect data that may be useful for assessing in-river risks from cyanide (i.e., low tide versus high tide conditions and/or river current velocity and direction).

Work Completed

Following is a summary of the work completed to achieve these objectives:

1. Barge mounted drilling equipment was used to complete borings along four offshore transects: Transects A, B, C, and D. Transect A is located at edge of shoreline and transect D is located approximately 550 feet from shoreline.

- Twelve borings were drilled along transect A, with seven of the borings drilled to basalt bedrock. One hundred six groundwater samples and 83 sediment samples were tested for cyanide species, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and metals.
- A total of 30 borings were drilled along transects B, C, and D, with eight of the borings drilled to refusal. One hundred five groundwater samples and 21 sediment samples were tested for cyanide species, SVOCs, VOCs, and metals.

2. Ultrasonic seepage meters were installed at seven offshore locations to measure seepage rates over a 5-day period.
3. Mini-piezometers were installed at three offshore locations. A total of 30 TZW porewater samples were obtained over multiple tidal cycles and tested for unfiltered analysis of the following parameters: metals (i.e., calcium, iron, magnesium, manganese, potassium and sodium), anions (i.e., chloride, sulfate and sulfide); alkalinity; total cyanide, amenable cyanide, and free cyanide; total organic carbon (TOC); dissolved organic carbon (DOC); polycyclic aromatic hydrocarbons (PAHs); and VOCs. Three sediment samples were obtained adjacent to the piezometer locations and laboratory tested for a similar suite of analytes. A total of 12 near bottom river water samples were obtained at the mini-peizometer locations, and tested for unfiltered alkalinity, chloride, sulfate, total suspended solids (TSS), and metals.
4. Willamette River water samples were collected at 20 offshore locations. At each location, water samples were collected from three depths:near surface, mid-depth, and near bottom. Samples were collected from all three depths for each of three tidal periods: ebb, slack high, and slack low. A total of 180 river water samples were tested for total cyanide, amenable cyanide, free cyanide, selected metals, and conventional parameters.

Findings

Groundwater Quality Findings

For the purpose of describing the nature and extent of manufactured gas plant (MGP) related chemicals of interest (COIs), this report focuses on free cyanide, total cyanide, benzene, toluene, naphthalene, and benzo(a)pyrene. These six target analytes have a

wide range of subsurface fate and transport properties, and their distribution are generally representative of the MGP-related COIs.

The depth, lateral extent, and concentration of COIs in offshore groundwater varies significantly for each COI. The complex distribution of COIs is largely a function of the long history of manufacturing at the Site, variations in operational practices over time, and the types of products that were manufactured.

Free cyanide has been detected in a very small percentage of the groundwater samples, and at trace concentrations where detected. This is significant because the free cyanide compound is considered the toxic form of cyanide. The detected concentrations were generally below 10 micrograms per liter (μg/L).

Total cyanide is present in groundwater in all offshore transects at generally all depths sampled. Total cyanide is very soluble, chemically stable, and does not adsorb significantly to the sediment matrix. Therefore, total cyanide is one of the most widely distributed of the MGP-related COIs.

The distribution of total cyanide appears to reflect two general sources. The first source is groundwater transport from two upland source areas; the upland former spent oxide storage pile area on the north end of the shoreline and the former upland effluent settling pond area. The second source is direct discharge of liquid wastes to areas that appear to have drained to the river on the south end of the Site, and direct placement of spent oxides along the shoreline on the north end of the Site.

Benzene, toluene, and naphthalene are also widely distributed, but their plume patterns are variable, reflective of both historical direct discharge or overflow of oily effluent to the river and groundwater transport from upland sources. Benzene, toluene, and crude naphthalene were manufactured as separate products, which may have influenced their offshore distribution in groundwater.

Consistent with a much higher tendency of benzo(a)pyrene to adsorb to organic carbon, its distribution in groundwater is quite limited compared to naphthalene (another PAH),

which is much more mobile in groundwater. The presence of elevated benzo(a)pyrene concentrations in offshore groundwater is primarily associated with the occurrence of non-aqueous phase liquid (NAPL) in shallow sediments. Although trace concentrations of benzo(a)pyrene are detected in some of the deeper groundwater samples, these are likely associated with the suspended solids in the groundwater grab samples obtained in this investigation.

Seepage Findings

At the three piezometer sampling locations, the TZW concentrations did not show a strong correlation with variations in river elevation for any of the COIs, which is counter to the primary hypothesis being investigated by this portion of the sampling effort. However, some of the COIs did show moderate correlation with river elevation changes at some of the sample sites, but this was often associated with very low level detections indicating no strong effect of river tides on chemical concentrations. Shallow TZW COI concentrations and sediment COI concentrations showed a strong correlation for total cyanide, all PAHs, and detected VOCs, indicating that bulk sediment concentrations are an important factor determining TZW concentrations. The near bottom river water concentrations did not show a consistent correlation with the co-located TZW concentrations.

Seepage data from the 2005 Lower Willamette Group (LWG) investigations at Gasco and Siltronic were combined with seepage data from the 2007 Gasco Seepage investigation to estimate a range of total seepage rate from 225 to 253 gallons per minute (GPM) from the area offshore of Gasco and Siltronic. This is comparable to the 200 GPM extraction well pumping rate that modeling indicated would be necessary to achieve upland groundwater source control. Considerable variation in seepage rates was observed across the Site, ranging from strongly positive to net negative fluxes to the river over the periods of meter deployment. There was no consistent correlation between seepage rate fluctuations over time at each site and river elevation changes or rainfall, although there were some marginal correlations noted for brief periods at a subset of the meter stations.

Cyanide in River Water Findings

The main objective of this study was to directly measure free cyanide concentrations (most relevant to evaluating potential risk) in the surface water. No free cyanide was detected in any surface water sample. There was one detection of free cyanide (unfiltered) in shallow TZW (1.5 to 2.5 feet below mudline), but all other TZW samples were non-detect for free cyanide. The concentration of free cyanide in the one shallow TZW sample (at 23 μg/L) was above the ecological Screening Level Value (SLV) for surface water of 5.2 μg/L. However, this criterion is based on toxicity to fish in surface water and TZW measurements are applicable to exposures of benthic invertebrates, which show a higher tolerance to free cyanide (as reviewed in this report). Thus, even this one TZW detection does not indicate a substantial risk to river aquatic life. These findings support that there are no substantial risks from Site cyanide to river aquatic life either from groundwater or direct deposition of materials containing cyanide to sediments. The low levels of free cyanide in TZW and groundwater at the Site relative to total cyanide supports the hypothesis that total cyanides in Site groundwater are predominantly complexed (e.g., with iron) and that they are not being measurably converted to free cyanide in river water due to photolysis or other geochemical changes.

As presented in a previous submittal to Oregon Department of Environmental Quality (DEQ) (Anchor 2007b) total cyanide in its various complexed forms is generally not toxic to aquatic life or people. The Portland Harbor Joint Source Control Strategy (JSCS) value of 140 μg/L total cyanide (and the Portland Harbor-specific adaptation of this value to 14 μg/L) is based on an U.S. Environmental Protection Agency (EPA) free cyanide-based Ambient Water Quality Criterion (AWQC) derived for the protection of human health from the consumption of fish. (Note that the assumption of the bioaccumulation of cyanide in fish tissue represented by this criterion is also highly questionable, as reviewed in this report.) Thus, the application of the free cyanide value to total cyanide is inconsistent with EPA promulgation of this criterion, and the absence of any detectable free cyanide concentrations confirms that surface water meets the JSCS SLVs. Regardless, total cyanide was infrequently detected in surface water and always at concentrations at or below the EPA's free cyanide human health AWQC of 140 μg/L. Further, most of these total cyanide detections were at or close to the JSCS's even more conservative adaptation of EPA's free cyanide AWQC (i.e., 14 μg/L). The surface water

data therefore indicate no risk to human health via fish consumption due to cyanide. Similarly, total cyanide values in surface water and shallow TZW are all below drinking water levels, indicating no risks to people from river water consumption, even if such exposures existed at the Site.

1 OFFSHORE GROUNDWATER INVESTIGATION

1.1 Introduction

On behalf of NW Natural, Anchor conducted a series of investigations in the Willamette River offshore of the Site during the period from July 2006 to October 2007. This report describes the work completed and findings from those investigations. The investigations included sampling and testing of groundwater, sediments, and river water. The groundwater investigation included testing of TZW samples. The transition zone is considered to be the uppermost portion of river sediment, just below the mudline, where groundwater and river water are mixed.

Section 1 covers Phases 1 and 2 of the offshore groundwater investigation. Section 2 describes the TZW tidal investigation. Section 3 covers the investigation of cyanide species in Willamette River water. Section 4 describes the use of seepage meters to measure discharge from the TZW into the river.

1.1.1 Background

The Phase 1 and 2 offshore investigations were conducted along the shoreline and in the river channel near the Site to further evaluate the nature and extent of contamination in groundwater and Willamette River sediments. The Site vicinity is shown on Figure 1.1. General features of the Gasco and Siltronic properties are shown on Figure 1.2.

1.1.2 Objectives

The primary objectives of the Phase 1 investigation were presented in the *Final Phase 1 Field Sampling Approach, Gasco Siltronic Groundwater Source Evaluation* (Anchor 2006b) (Phase 1 Work Plan), and are repeated below:

1. Determine how the vertical and lateral extent of chemicals in groundwater along the shoreline may be related to chemical concentrations that have already been measured in upland groundwater.
2. Define the general nature of the subsurface geotechnical conditions along the shoreline to inform feasibility of all potential source control alternatives, including a potential vertical barrier.

These objectives were accomplished through sampling and laboratory testing of subsurface sediment and groundwater collected from 13 borings located along the river edge as shown on Figure 1.3. The Phase 1 investigation findings were presented in the *Phase 1 Report and Phase 2 Field Sampling Approach, Gasco Siltronic Groundwater Source Evaluation* (Anchor 2007a; Phase 2 Work Plan). The Phase 1 findings are summarized in Section 1.2 of this report.

As stated in the Phase 1 Work Plan, the primary objectives of the Phase 2 offshore investigation are:

1. To understand how the vertical and lateral extent of chemicals in groundwater beneath the river and TZW may be related to chemical concentrations measured in upland groundwater. This will be accomplished through sampling and laboratory testing of offshore groundwater and TZW.
2. To understand how groundwater and TZW concentrations may be related to direct historical deposition of materials in the river. This will be accomplished through sampling and chemical analysis of bulk sediment and observations of waste material potentially present in those river sediments.
3. Determine if the chemical concentrations in the biologically active TZW in navigation channel sediments have been directly impacted by historical deposition of waste materials in the river. This will be accomplished through collection of TZW and sediment for chemical analyses.

The Phase 2 investigation was conducted in two steps. The Phase 2 Step 1 and Step 2 investigations and findings are described in Sections 1.3 and 1.4 of this report.

1.2 Phase 1 Investigation

This section provides a summary of the detailed Phase 1 findings that were presented in the Phase 2 Work Plan (Anchor 2007a). All of the Phase 1 tables and figures referenced in this section were presented in the Phase 2 Work Plan and are provided in Appendix A to this report.

1.2.1 Phase 1 Sampling Summary

The Phase 1 investigation consisted of 13 borings, GS-00 through GS-12. The borings were drilled with a barge-mounted Rotosonic drill rig. All Phase 1 in-water work was conducted during the in-water work windows from July 1 to October 31, 2006, and from December 1, 2006 to January 31, 2007. These work windows applied to borings GS-01 through GS-12 drilled along the shoreline. The work windows did not apply to boring GS-00, which was drilled at a location on the Site upland, which is above Ordinary High Water elevation. Borings GS-05, -07, -08, and -09 were completed in October 2006. Boring GS-00 was completed in November 2006. Borings GS-01, -02, -03, -04, -06, -10, -11, and -12 were completed in December 2006 and January 2007.

Groundwater samples were obtained at the following planned depths below mudline in the shoreline GS borings: 4 to 6 feet, 9 to 11 feet, and at approximate 25-foot intervals to the bottom of each boring. The actual sample depth intervals varied slightly due to conditions at each boring location. For upland boring GS-00, the first sample was obtained at the 23 to 27-foot depth interval, the depth of the water table. Soil and sediment samples were also obtained in each boring.

1.2.2 Phase 1 Summary of Findings

1.2.2.1 Geology

The figures and tables referenced in this section are provided in Appendix A. Borings GS-01 through GS-12 were located on approximate 200 ft intervals along the shoreline, as shown on Appendix A, Figure 3. Boring GS-00 was sited in an upland location near the north Gasco property line.

As specified in the Work Plan, the odd numbered borings were drilled through the full thickness of the alluvium to the underlying Columbia River basalt bedrock. The even numbered borings were drilled to a maximum depth of 150 feet below mudline, or to bedrock, whichever was encountered first. The upland boring GS-00 was drilled to bedrock.

The geologic sequence encountered along the shoreline consisted of a thin surface cobble/riprap layer, underlain by river alluvium extending down to basalt bedrock.

The geologic units are shown on the subsurface profile A-A', Appendix A, Figure 4. The primary difference between the shoreline geologic sequence and the upland geology is the absence of the fill layer, which overlies the alluvium in the upland portion of the Site.

The lithology of the river alluvium along the shoreline is essentially the same as that present under the Site upland, consisting primarily of sand to silty-sand, interbedded with silt to sandy-silt. Sieve analyses were conducted on a representative number of the sediment samples, and the grain size data are summarized in Appendix A, Table 5. The grain size analyses show that the upper alluvium generally consists of very fine to fine sand and the lower alluvium is predominantly medium sand. The coarsening from fine to medium sand occurs at about -50 feet mean sea level (MSL) in the northern reach of the Gasco shoreline, and deepens to about -70 feet MSL or deeper along the southern Gasco shoreline. The upper alluvium also has a higher percentage of silt interbeds, although silt interbeds are also present in the lower alluvium.

A layer of alluvial gravel was encountered in several borings at the contact with basalt bedrock. The depth to bedrock was highly variable at the north end of the shoreline. The highest bedrock elevation of about -70 feet was encountered in boring GS-01, and the lowest bedrock elevation was about -190 feet, in boring GS-05. From GS-05 the bedrock elevation rises gradually to about -175 feet at GS-12 on the Siltronic shoreline. In many of the borings, the alluvium/bedrock contact was characterized by a layer of highly weathered basalt.

1.2.2.2 Groundwater Quality

Sample intervals for each boring are listed in Appendix A, Table 1.

Appendix A, Table 3 lists the lab test methods and the test results for the groundwater chemistry analyses. For the purpose of describing the nature and extent of MGP-related COIs, this report focuses on benzene, naphthalene, total cyanide, amenable cyanide, and free cyanide.

The groundwater concentrations of benzene, naphthalene, total cyanide, amenable cyanide, and free cyanide are shown on subsurface profiles in Appendix A, Figures 5a through 5e. The zones where NAPL was detected by field screening of the sediment cores are also shown on the Appendix A, Figure 5 profiles.

Review of the Appendix A, Figure 5 groundwater chemistry profiles shows additional information on the conceptual site model tying the history of MGP-related materials management with the depth and concentration profile of target COIs. The highest shoreline groundwater concentrations of petroleum-sourced COIs, as indicated by benzene and naphthalene, are associated with the occurrence of shallow tar or NAPL in borings GS-08 (tar), -09 and -10 (NAPL). The NAPL and tar present in shallow shoreline sediments is sourced from MGP residuals that were discharged to overland drainages to the river, as described in the upland Remedial Investigation (RI) report (HAI 2007). This can also be seen in the high benzene and naphthalene concentrations of the shallow sediments, for example in Appendix A, Figures 6a (benzene) and 6b (naphthalene). The very high concentrations in sediments are mostly likely due to historical discharge of MGP residuals to the river across the shoreline. Also, given the extensive dredge, fill, and movement of soils/sediments of this shoreline over time (see RI; HAI 2007), these materials may have been relocated to varying sediment depths. The NAPL and NAPL/water mixtures identified in the sediments may have infiltrated downward into the shallow river sediments following discharge, particularly when the mudline was exposed during low tide periods.

The depth of vertical penetration of NAPL and NAPL/water mixtures was restricted by the prevalence of silty-sand and silt interbeds in the upper alluvium. The pattern of lower groundwater concentrations of benzene and naphthalene deeper in the profiles appears consistent with the concentrations of benzene and naphthalene delineated by the upland monitoring wells. The upland plumes are associated with former process or waste management areas, as depicted in the benzene and naphthalene plume patterns on Figures 5a and 5b.

Cyanide was tested in 92 groundwater samples from shoreline borings GS-1 to GS-12, representing all depths of the alluvium. Total cyanide was detected in all samples tested, but free cyanide was detected in only 11 samples at concentrations ranging from 5 to 9 μg/L. The free cyanide laboratory method reporting limit (MRL) is 10 μg/L and the method detection limit (MDL) is 5 μg/L. . EPA and DEQ free cyanide aquatic toxicity criteria is 5.2 μg/L. For the eleven detections, the free cyanide concentration ranged from 0.08 to 8 percent of the total cyanide concentration. Of the 11 samples, the average free cyanide concentration was approximately 2 percent of the total cyanide concentration.

The concentrations and extent of cyanide species in shoreline groundwater are reflective of a somewhat different conceptual site model than the NAPL-sourced petroleum constituents. Appendix A, Figures 5c, 5d, and 5e show that the highest concentrations of cyanide are in shallow shoreline groundwater samples from borings GS-01 to GS-03, and GS-06 to GS-07. Whereas the highest concentrations of petroleum derived COIs were associated with the presence of shallow NAPL in borings GS-08, -09 and -10, the highest cyanide concentrations are correlated with nearby upland spent oxide storage area (GS-01 to GS-03) or the former effluent discharge area (GS-06 to GS-07). The upland RI (HAI 2007) describes a large spent oxide pile on the north shoreline. Erosion and runoff from this spent oxide storage area may have caused spent oxide materials to concentrate along the shoreline, particularly in the areas of borings GS-01 to GS-03. Historical effluent discharges or overflows to the shoreline area north of the effluent settling ponds may be a cause for the observed elevated cyanide concentrations at the GS-06 to GS-07 locations. As noted previously, free cyanide was detected in only about 12 percent of the 92 groundwater samples tested, and was detected at concentrations lower than the MRL of 10 percent. Lower cyanide concentrations in deeper portions of the plumes appear to reflect the cyanide plume present in the upland shoreline monitoring wells.

In borings GS-01 through GS-06 benzene concentrations ranged from 1 to 100 μg/L in the 4 to 6-foot sample interval, but the concentrations were generally below detection or less than 1 μg/L below that depth (Appendix A, Figure 5a). The highest

benzene concentrations were detected in borings GS-08 through GS-10. Benzene concentrations up to 710 μg/L were measured in the 9 to 11-foot depth interval. The 100-foot sample interval in borings GS-08, -09, and -10 had benzene concentrations ranging from 76 to 310 μg/L. Below the 100-foot interval, however, the concentrations consistently drop to less than 5 μg/L, or below detection.

Appendix A, Figure 5b shows that the general pattern of naphthalene detections is very similar to benzene detections. In general, the only naphthalene detections above 1 μg/L in borings GS-01 to GS-06 were in the 4 to 6-foot or 9 to 11-foot samples. As with benzene, the concentrations drop under 1 μg/L at depths below 100 feet in the GS-07 to -10 borings. The laboratory MRL for naphthalene is 0.02 μg/L, more than ten times lower than the benzene MRL of 0.5 μg/L. The data show that naphthalene is present at very low concentrations throughout the saturated thickness of the alluvium.

Amenable and free cyanide concentrations are shown on Appendix A, Figures 5d and 5e. By definition, the amenable and free cyanide concentrations are a fraction of the total cyanide. Appendix A, Figure 5c shows that total cyanide is present throughout the saturated thickness of the alluvium. Total cyanide does not appear to attenuate as quickly with depth in the alluvium as benzene and naphthalene. The highest concentrations of total cyanide were detected in the 4 to 6-foot and 9 to 11-foot samples in borings GS-01 to GS-03. Total cyanide concentrations ranging from 2 to 100 μg/L were detected at the base of the alluvium, just above the bedrock contact.

1.2.2.3 Sediment Chemistry

The figures and tables referenced in this section are in Appendix A. The sediment chemistry data are on Appendix A, Table 4. Appendix A, Figures 6a, 6b, and 6c show the concentration and extent of benzene, naphthalene, and cyanide on cross section A-A′.

Consistent with the description of the groundwater plume in Section 1.2.2.2, the highest concentrations of petroleum-derived COIs, as indicated by the benzene and naphthalene concentrations, are in the shallow sediments in borings GS-07 to GS-10.

The high shallow benzene and naphthalene concentrations are consistent with the NAPL detections in the shallow sediment from this area of the shoreline. The results of NAPL field screening of the sediment core are listed on Appendix A, Table 6. Comparison of benzene concentrations on Appendix A, Figures 5a and 6a show that concentrations in shallow sediment are generally higher than groundwater concentrations from similar sample intervals. These sediment concentrations are much higher than would be expected from adsorption of dissolved phase groundwater contaminants moving through these sediments, indicating that they derive from the historical discharge of MGP materials to the sediments, as discussed previously. In contrast, the benzene and naphthalene concentrations in deeper alluvial sediments are generally lower than the groundwater concentrations from similar sample intervals, because the sediment contamination at depth results from adsorption from the upland groundwater plume.

As with benzene and naphthalene, cyanide concentrations in shallow shoreline sediments are generally much higher than the groundwater concentrations from similar intervals, as shown by comparison of the concentrations on Appendix A, Figures 5c and 6c. Again, this indicates that the concentrations derive from MGP materials historically deposited or discharged to the shallow sediments along the shoreline. The groundwater cyanide concentrations in the deeper alluvium are higher than the sediment concentrations, because the sediment cyanide is likely the result of adsorption from the upland groundwater plume.

1.3 Phase 2 Step 1 Investigation

Phase 2 of the investigation was focused on defining the nature and extent of groundwater contamination beyond the shoreline, specifically in the portion of the river channel identified by the LWG as a possible groundwater discharge zone. The LWG prepared a draft report, *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Transition Zone Water Site Characterization Summary Report* (Integral 2006). Chapter 7 of the Round 2 Groundwater Pathway Report describes the results of a TZW assessment conducted in the nearshore area adjacent to the Gasco Site. That assessment found the possible presence of a groundwater discharge zone near the toe of the slope near the edge of the navigation channel.

Figure 7-2 of the LWG Round 2 Groundwater Pathway Report shows the location of six transects of trident and seepage meter sample locations adjacent to Gasco. Transect A is located near the toe of the riverbank and transect F is located approximately 340 feet from transect A. Sediment porewater temperature measurements were made using the trident probes. Figure 7-2 shows which of the sample locations had the highest difference between the sediment porewater temperature and the ambient Willamette River water temperature. The areas with the highest temperature difference (delta) indicate possible groundwater discharge zones. Review of Figure 7-2 shows that moderate to high temperature deltas were calculated for the samples located along transects D and E, which roughly correspond with the toe of the slope that defines the navigation channel. This area is designated as sample transect B for this Phase 2 investigation for the Gasco Site.

The LWG Round 2 Groundwater Pathway Report also delineated potential groundwater discharge zones. Figure 7-7 of the report shows a possible groundwater discharge zone (light orange color) in the navigation channel adjacent to the Gasco Site. The zone of possible groundwater discharge identified on that figure is consistent with the groundwater discharge zone identified off shore of the Siltronic property, which is described in Section 8 of the LWG Round 2 Groundwater Pathway Report.

The map boundaries of the Gasco Phase 2 investigation are roughly coincident with the possible groundwater discharge zone identified in the Round 2 Groundwater Pathway Report on Figure 7-7, but extending farther into the channel.

The Phase 2 investigation was conducted in two field steps as described in the following sections.

1.3.1 Work Plan Development

The May 2007 Phase 2 Work Plan (Anchor 2007a) describes in detail the intended Phase 2 investigation. Subsequent discussions and meetings with DEQ led to modifications to the Phase 2 Field Sampling Approach. Some of the modifications were made during the field investigation in response to site-specific field conditions encountered during

sampling. The modifications were documented in the sequence of communications and documents listed below:

- June 28, 2007, DEQ Comment Letter on the Phase 2 Offshore Field Sampling Approach
- July 2, 2007, Addendum to Phase 2 Field Sampling Approach, Anchor letter from John Edwards to Dana Bayuk
- July 16, 2007, meeting with DEQ
- July 17, 2007, Modification to Step 1 Pore Water Sample Protocol, email from John Edwards to Dana Bayuk

Each of these documents modifying the Work Plan is located in Appendix B.

1.3.2 Phase 2 Step 1 Field Sampling

The purpose of the Step 1 reconnaissance sampling was to identify the primary offshore zones of groundwater discharge to the extent practicable in the navigation channel. The field sampling protocols followed the Work Plan and Work Plan modifications described in Section 1.3.1. A total of 23 Step 1 boring locations were completed in July 2007. Sample location transects B, C, and D are shown on Figure 1.3. The transect B samples were advanced along the toe of the slope that defines the navigation channel. Transect C samples were approximately 350 feet from the toe of the riverbank, and transect D samples were approximately 550 feet from the toe of the riverbank.

A barge mounted push probe drill rig was used to obtain groundwater samples from three depths at each of the transect B, C, and D locations on Figure 1.3. The three planned sample depths below the mudline were 1 to 2 feet, 5 to 7 feet, and 13 to 15 feet. After each set of three samples were obtained at each location, the barge was moved to the next location and the process repeated until all 23 locations, including all three transects, were completed.

1.3.2.1 Sampling Procedures

Locations GS-B6 and GS-B7

First, the barge was moved into position and the GPS coordinates were recorded. The GPS coordinates are in Table 1.1. The mudline depth was then measured with a

lead weighted line. The push probe sampling screen assembly was fitted with a white polyethylene disc, held in place with rubber discs and hose clamps, at 1 foot above the bottom of the screen. The purpose of the disc was to reduce the potential for river water to short circuit to the screen interval. An underwater video camera was attached above the polyethylene disc. The purpose of the video camera was to confirm that the disc had contacted the mudline. The screen assembly with the attached camera was lowered to the measured mudline depth. When the polyethylene disc made contact with the mudline, the screen was pushed downward 1 foot to expose the stainless steel screen to the 1 to 2-foot interval below mudline. Polyethylene tubing fitted with a stainless steel check valve was lowered through the drill rod down into the screen section and the sample was collected from the barge using a Waterra inertia pump. Field water quality parameters (pH, conductivity, temperature, oxidation-reduction potential [ORP], and dissolved oxygen) were measured at approximate 0.5-gallon intervals until the parameters stabilized to within 10 percent of the previous reading, then a minimum of one drill rod casing volume was removed, and sampled bottles were filled. The final field water quality parameters for each sample interval are in Table 1.2.

After sample collection, the screen assembly was removed, decontaminated, and pushed to the 5 to 7-foot interval. The screen was pushed open and purging and sampling was completed as above. The process was then repeated for the 13 to 15-foot interval.

Remaining Transect B, C, and D Locations

Following completion of borings GS-B6 and GS-B7, DEQ requested a modification to the sampling procedure. Instead of the polyethylene disc discussed in the section above, a 3-inch-diameter outer steel casing was fitted with an approximately 12-inch-diameter metal plate. The steel plate was located at the bottom of the 3-inch steel casing. As with the polyethylene disc, the steel plate was added to minimize the potential for short circuiting of river water into the sampling interval. After the mudline depth was measured with a lead weighted line, the 3-inch outer casing and steel plate assembly was lowered to within 3 feet of the mudline. The underwater camera was lowered down through the 3-inch casing and out through the bottom of

the casing to visually observe the mudline. The depth interval between the bottom of the casing and the mudline was measured, and then the casing was lowered until the steel plate contacted the mudline as seen on the camera. The 3-inch casing was clamped to the drill rig. The drill rod/screen assembly was then lowered into the 3-inch casing and pushed to 1 foot below the steel plate and the screen was pushed open (downward) 1 foot to expose the stainless steel screen to the 1 to 2-foot depth interval below the steel plate.

After the 1 to 2-foot interval sample was collected, the screen assembly was removed from the 3-inch outer casing, and the outer casing was unclamped from the rig to determine if the outer casing/plate assembly would sink under its own weight into the sediment. At those locations where the plate settled 1 foot or more, DEQ requested that the mudline depth be considered to be the depth of the settled plate, rather than the mudline as observed through the underwater video camera. The plate sank less than 1 foot at all locations except boring GS-B2, where the plate sank 3.7 feet. At location GS-B2, a second 1 to 2-foot interval (recorded as 4.5 to 5.5 feet) sample was collected as measured from the settled mudline elevation. At GS-B2, the 5 to 7-foot interval (recorded as 8.5 to 10.5 feet) and 13 to 15-foot interval (recorded as 16.5 to 18.5 feet) samples were measured below the settled plate depth. At all other borings, the 3-inch outer casing sank less than 1 foot. Prior to obtaining the 5 to 7-foot and 13 to 15-foot interval samples, the screen assembly was removed and decontaminated as previously described.

1.3.3 Laboratory Testing and Data Validation

As documented in the Field Data Sheets (Appendix C), Anchor personnel prepared the daily samples for Columbia Analytical Services, Inc (CAS), the project testing laboratory. CAS staff picked up the ice chests daily for transport to the CAS lab in Kelso, Washington. The chain-of-custody forms are in Appendix C. The CAS lab reports are provided on a DVD in Appendix D.

The groundwater chemistry data are in Table 1.3.

Final laboratory data packages were reviewed by Anchor personnel and Laboratory Data Consultants, Inc. (LDC) of Carlsbad, California. The following documents were used as guidelines during laboratory data validation:

- The Phase 2 Work Plan (Anchor 2007a)
- EPA SW 846 Third Edition, Test Methods for Evaluating Solid Waste, Update 1, July 1992; update IIA, August IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; and update IIIA, April 1998
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA Contract laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- American Standard Test Methods

A preliminary validation review was performed upon receipt of the data package by Anchor personnel. The preliminary data review allows the data to be evaluated quickly so that an expedited determination of acceptability of data could be made in case reanalysis is required. The following criteria are included in the preliminary data review:

- Chain-of-custody
- Data completeness
- Holding times
- Data format (e.g., significant figures, units)
- QA sample summaries (blanks, matrix spikes, matrix spike duplicates (MS/MSD) and/or laboratory replicates/duplicates)

Once the reviewed package was approved, it was forwarded to LDC for final validation. The final data validation process consists of a highly detailed and rigorous data review. The validation is designed to evaluate the data's usability, acceptability, and bias that may exist in the data. The data packages submitted for validation were reviewed for the following quality assurance criteria where applicable:

- Data completeness and evidentiary audit
- Technical holding times exceedances
- Instrument performance before, during, and at the end of the analytical sequence

- Gas chromatograph/mass spectrometer (GC/MS) instrument performance checks
- Initial and continuing calibrations
- Sample processing/preparation and clean-ups
- Instrument detection limits and sample quantification limits
- Deviations from the analytical methods
- Compounds identification and confirmation
- Laboratory calculations
- Method blanks
- Quality control sample results
  - Surrogate recoveries
  - MS/MSD
  - Laboratory control samples and duplicates (LCS/LCSD)
  - Field duplicates/replicates
  - Laboratory duplicates
  - Method analytical spikes (USEPA Method 7000)
- Overall data assessment

Data from each lab package were evaluated and documented in a data review report by LDC. All data from the LDC reviews were considered useable as qualified with the exception of benzo(a)pyrene at locations GS-D3 and GS-D4 which were rejected. Any data qualifiers applied to the data during the final validation procedure have been incorporated into the final database for this project. Copies of the data validation reports can be found in Appendix E.

1.3.4 Phase 2 Step 1 Findings

1.3.4.1 Groundwater Quality

Per the Work Plan, Step 1 groundwater samples were obtained at the following planned depths below mudline: 1 to 2 feet, 5 to 7 feet, and 13 to 15 feet. The actual sample depth intervals varied slightly due to conditions at each boring location, and are listed with the data on Table 1.3.

As required in the Work Plan and shown on Table 3.1, the groundwater samples were laboratory tested for a comprehensive list of total and dissolved metals, VOCs, SVOCs, ammonia, free cyanide, amenable cyanide, and total cyanide. Table 3.1

combines the groundwater quality data from the Step 1 and Step 2 investigations. During field purging, the groundwater was also tested for pH, conductance, temperature, ORP, dissolved oxygen, and turbidity. The water quality parameters tested in the field are listed in Table 1.2.

For the purpose of describing the nature and extent of MGP-related COIs, this report focuses on free cyanide, total cyanide, benzene, toluene, naphthalene, and benzo(a)pyrene. These six target analytes have a wide range of subsurface fate and transport properties, and their distribution are generally representative of the MGP-related COIs.

The groundwater quality data for the six analytes are presented in Figures 1.4 through 1.10. These figures combine the groundwater quality data from the Step 1 shallow and Step 2 deep borings. Subsurface profiles A through G are presented in the figures (i.e., Figure 1.4 is profile A-A′ and Figure 1.10 is profile G-G′). The location of each of the subsurface profiles is on the map in Figure 1.3. Each figure contains six sheets, one for each of the six target analytes. For example, Figure 1.4a shows the free cyanide data for subsurface profile A-A′. The subsurface profiles in Figures 1.4 through 1.10 provide a comprehensive view of the nature and extent of MGP-related COIs in groundwater below the Willamette River channel. The range of COI concentrations are depicted using color shading on the subsurface profiles. The concentration ranges for each color were selected to represent the nature and extent of each COI, and are not intended to represent risk.

The discussion of the nature and extent of offshore groundwater contamination derived from Step 1 is presented with the Step 2 data in Section 1.4.4.2.

1.3.4.1.1 JSCS Screening

The Phase 2 Step 1 groundwater quality data were screened against conservative JSCS criteria, as shown on Table 1.3. The results of screening the Step 1 data are presented with the Step 2 data in Section 1.4.4.2.1.

1.4 Phase 2 Step 2 Investigation

1.4.1 Phase 2 Work Plan Development

As discussed above, the Phase 2 Work Plan contains a detailed description of the scope of the Phase 2 Step 2 investigation. In addition to the Phase 2 Work Plan modifications described in Section 1.3.1, two subsequent modifications were made during the Step 2 field investigation.

- August 14, 2007, Phase 2 Step 2 Field Sampling Approach, Anchor letter from John Edwards to Dana Bayuk
- August 30, 2007, Telecon between John Renda and Dana Bayuk re: change of sediment sample interval from 8 to 10 feet below mudline to 13 to 15 feet below mudline

A copy of the August 14 letter is in Appendix B.

1.4.2 Phase 2 Step 2 Field Sampling

Following DEQ and NW Natural review of the Phase 2 Step 1 groundwater quality data, the following eight Step 1 boring locations were selected for further investigation during Step 2:

- GS-B2
- GS-C2
- GS-B5
- GS-C5
- GS-D2
- GS-B7
- GS-C7
- GS-D4

The eight borings are located along subsurface profiles E-E′, F-F′, and G-G′ as shown on Figure 1.3. These eight boring locations were selected by NW Natural and DEQ to be generally representative of subsurface conditions offshore of the Site.

The barge mounted push probe drill rig was remobilized to conduct Step 2. During Step 2, the drill rig was set up at the eight selected boring locations to obtain groundwater

samples at approximate 25-foot depth intervals below mudline. The actual groundwater sample depth intervals varied slightly due to conditions at each boring location and are listed with the data on Table 1.3. The borings were advanced until sampler refusal occurred, and that depth was assumed to represent the basal alluvial gravel or basalt bedrock. Refusal was encountered at depth ranging from 63 to 144 feet below mudline.

Shallow sediment sampling included sediment cores down to approximately 15 feet below mudline. The sediment samples were laboratory tested for MGP-related chemicals.

When the push probe drill was set up to obtain groundwater samples in Step 2, an attempt was made to use a push probe core barrel to obtain the sediment cores. Consistent with previous offshore investigations, poor recovery was encountered using the push probe macro-core sampler to collect shallow sediment samples.

Because of poor recovery using the push probe core barrel, a piston-core sampler with 12-foot-long, 3-inch-diameter aluminum core barrels was built to sample sediment from 0 to 10 feet below mudline. The drill rod was used to lower the piston core sampler to immediately above the mudline. As in Phase 2 Step 1, the mudline depth was determined using a combination of lead line measurements and underwater video camera observations. Once at the proper depth, the cable attached to the piston was locked in place while the core barrel was pushed into the sediments to a depth of 10 feet below mudline. To improve recovery percentage, a core catcher was added to end of the core barrel. The push probe sampler was then used to obtain sediment samples from the 13 to 15-foot interval. As reflected on Table 1.4 and the boring logs in Appendix F, there was no sample recovery from the 13 to 15-foot interval in borings GS-C2, D2, and D4, in spite of multiple sample attempts.

After opening the sediment cores, the sample for VOC testing was collected first, as quickly as possible to minimize volatilization, following EPA method 5035A. The cores were then logged following the unified soil classification system (the boring logs are in Appendix F). After logging the core, the remaining sample portion was homogenized in

a stainless steel bowl and the remaining sample containers were filled. The remaining sediment core material was bagged for NAPL screening.

The sediment samples were screened for the presence of NAPL using visual inspection by Anchor personnel and ultraviolet light by Hahn Associates, Inc. (HAI) personnel. The sediment sample NAPL screening results are in Table 1.5.

1.4.3 Laboratory Testing and Data Validation

Laboratory testing and data validation was performed as described in section 1.3.3. The chain-of-custody forms are in Appendix C. The CAS lab reports are provided on a DVD in Appendix D.

The laboratory groundwater quality data are in Table 1.3. DEQ also requested that NW Natural test two deep groundwater samples for selected Rhone Poulenc COIs, specifically dioxin, furan, and herbicide analytes. The deepest groundwater samples obtained at borings GS-B7 and GS-C7 were tested accordingly, and the laboratory results are shown in Table 1.6. Most of the dioxin/furans were detected, but none of the herbicides were detected.

The laboratory sediment chemistry data are in Table 1.4.

Data from each lab package was evaluated and documented in a data review report by LDC. All data from the LDC reviews were considered useable as qualified. Any data qualifiers applied to the data during the final validation procedure have been incorporated into the final database for this project. Copies of the data review reports can be found in Appendix E.

1.4.4 Phase 2 Step 2 Findings

1.4.4.1 Geology

As discussed above, sediment cores were obtained to a maximum depth of 15 feet below mudline. The sediment lithology is shown on subsurface profiles E-E′, F-F′, and G-G′ on Figures 1.11, 1.12, and 1.13, respectively. At locations GS-C2, GS-D2, and GS-D4, there was no sample recovery after three attempts at each location and

therefore, only the upper 10 feet of core was sampled, logged, and submitted for laboratory analysis.

The profiles show that shallow sediment along the B transect is mostly silt, while shallow sediment along the C and D transects is mostly sand. These findings are consistent with the findings of previous investigations by LWG and NW Natural. The silt layer was thickest along the B transect at locations GS-B2 and GS-B7. At location GS-B5, a 0.5 foot sand layer overlies the silt. GS-B5 is in close proximity to the pilot cap, and the surficial sand layer is likely part of the fringe cap placed as part of the 2005 removal action/pilot cap. At locations BS-C2, -C5, -C7, -D2, and -D4 the upper silt layer ranged from 0.5 to 1 feet in thickness.

1.4.4.2 Groundwater Quality

This section describes the nature and extent of MGP-related groundwater impacts beneath the Willamette River channel. The groundwater quality data are in Table 1.3. These are the combined findings of the Phase 2, Step 1 and Step 2 investigations described previously in this report.

For the purpose of describing the nature and extent of MGP-related COIs, this report focuses on free cyanide, total cyanide, benzene, toluene, naphthalene, and benzo(a)pyrene. These six target analytes have a wide range of subsurface fate and transport properties, and their distribution is generally representative of the MGP-related COIs. The results of screening all of the target analytes against JSCS criteria are discussed in Section 1.4.4.2.1.

The groundwater quality data for the six analytes are presented in Figures 1.4 through 1.10. These figures combine the groundwater quality data from the Step 1 shallow and Step 2 deep borings. Subsurface profiles A through G are presented in the figures (i.e., Figure 1.4 is profile A-A′ and Figure 1.10 is profile G-G′). The location of each of the subsurface profiles is on the map in Figure 1.3. Each figure contains six sheets, one for each of the six target analytes. For example, Figure 1.4a shows the free cyanide data for subsurface profile A-A′. The subsurface profiles in Figures 1.4 through 1.10 provide a comprehensive view of the nature and extent of

MGP-related COIs in groundwater below the Willamette River channel. The range of COI concentrations are depicted using color shading on the subsurface profiles. The concentration ranges for each color were selected to represent the nature and extent of each COI, and are not intended to represent risk.

In addition to the subsurface 2-D profiles in Figures 1.4 through 1.10, it is also instructive to view the 3-D schematic profiles shown on Figures 1.17, 1.18, and 1.19. Like the 2-D profiles, the 3-D schematics also show the distribution of the six target analytes, but from a viewpoint out in the river. The 3-D schematics are integrated with a shoreline aerial photo to provide orientation to Site features.

Review of the subsurface profiles in Figures 1.4 through 1.10 shows that the distribution of MGP-related COIs in groundwater below the river channel is complex. The depth, lateral extent, and concentration of COIs shown on the profiles vary significantly for each COI. The complex distribution of COIs is largely a function of the long history of manufacturing at the Site, variations in operational practices over time, and the types of products that were manufactured. To help understand the findings from the offshore groundwater investigation, it is useful to review the history of manufacturing at the Site. The following information is summarized from Section 2 of the *Remedial Investigation Report, NW Natural-Gasco Facility* (HAI 2007).

Portland Gas & Coke Company manufacturing operations began in 1913 and ended in 1956. Throughout that period, a heavy oil petroleum feedstock was used to create oil gas. At various times during the 1913 to 1956 period, the facility also manufactured the following products:

- Lampblack briquettes
- Soft pitch
- Specification tars and distillates
- Specification creosote
- Hard pitch
- Electrode grade pitch
- Crude naphthalene

- Crude benzene
- Motor fuel
- Toluene
- Xylene
- Solvent naptha

The RI Report also provides a detailed discussion of historic waste management practices at the Site, including the likely sources of specific COIs. For example, the spent oxide wastes were a source of cyanide. The oils, tars, and pitch were sources of petroleum derived COIs, such as benzene, toluene, ethylbenzene, and xylene (BTEX) and PAHs. With this manufacturing and waste management background, it is easier to understand the following discussion on nature and extent of COIs in groundwater below the river channel.

Review of the subsurface profiles (Figures 1.4a through 1.10a) shows that free cyanide has been detected in a very small percentage of the groundwater samples, and at trace concentrations where detected. Figure 1.17 contains a 3-D profile of free cyanide detections. Free cyanide was detected in only eight samples in transect A, four samples in transect B, one sample in transect C, and was not detected in transect D. The detected concentrations were all below 10 μg/L, except for samples in borings GS-B2 and GS-C2, which were less than 27 μg/L. Most of the detections of free cyanide occur offshore of the former spent oxide storage pile that was located on the north shoreline of the Site. This is reflected in the free cyanide detections in borings GS-01, -02, -03, -B1, -B2, and -C2. Of these northern offshore borings, free cyanide was detected in shallow TZW at locations GS-01, -03, and -B2. However, only at GS-B2 was free cyanide detected in the top TZW interval. As discussed in Section 4, free cyanide was not detected in river water samples obtained in this area.

The subsurface profile sheets Figures 1.4b through 1.10b show that total cyanide is present in groundwater in all transects at generally all depths sampled. Total cyanide is very soluble, chemically stable, and does not adsorb significantly to the sediment matrix. Therefore total cyanide is one of the most widely distributed of the MGP-related COIs.

The distribution of total cyanide appears to reflect two general sources. Figure 1.17 provides a comprehensive 3-D view of the total cyanide plume. The first source is groundwater transport from two upland source areas: the upland former spent oxide storage pile area on the north end of the shoreline and the former upland effluent settling pond area. The former effluent pond area was backfilled with a mixture of soil, spent oxide solids, and tar. The second source is direct discharge of liquid wastes to areas that appear to have drained to the river on the south end of the Site, and direct placement of spent oxides on the shoreline on the north end of the Site. Review of the vertical concentrations in the borings reflects the effects of the two sources. For example, at location GS-B2 on Figure 1.5b, the total cyanide concentrations in the shallow TZW samples are over 2,000 μg/L, reflecting the source from direct discharge from the spent oxide piles to shallow sediments. However, the total cyanide concentrations at depth decrease from a high of 330 μg/L in the sample from a depth of 140 feet below mudline, to only 4 μg/L in the sample obtained from 23 to 27 feet below mudline. These concentration distributions indicate that total cyanide is sourced both from direct discharge to the river and groundwater transport. This is also consistent with the distributions of total cyanide in bulk sediment samples found by the LWG and others as mapped in the Phase 1 Report, where the highest bulk sediment cyanide concentrations in surface sediments occur immediately off the former spent oxide pile area.

Review of the profiles also shows that total cyanide concentrations decline dramatically with distance from the shoreline. This may be caused by two factors: historic overflow of wastes to the river near the shoreline, and attenuation of the dissolved groundwater plume between the shoreline and transect D.

The distribution of benzene in offshore groundwater is also reflective of both historic direct discharge of MGP residuals to the river and groundwater transport from upland sources. The distribution of benzene concentrations on Figure 1.4c indicates elevated benzene concentrations in shallow groundwater samples associated with NAPL at borings GS-08, -09, and -10. In those borings, there are also elevated benzene concentrations at depth that do not appear connected to NAPL in

sediments. These higher benzene concentrations at depth are likely due to groundwater transport from the former effluent settling pond area, where similarly high concentrations are present. The profiles also show that benzene concentrations decline rapidly with distance from shore, and that the distal end of the benzene groundwater plume is generally between transects C and D. Figure 1.18 provides a 3-D schematic of the offshore benzene plume.

The nature and extent of toluene in offshore groundwater is significantly different than cyanide and benzene. The 3-D schematic on Figure 1.18 illustrates the differences in offshore distribution between the benzene and toluene plumes. Review of the toluene concentrations along transect A in Figure 1.4d shows that toluene was detected in only a few samples near the shoreline and generally at concentrations less than 30 μg/L. However, Figures 1.5d through 1.10d show that toluene was detected in most of the groundwater samples obtained at all depths from transect B out to transect D. Furthermore, the toluene concentrations at many of the offshore borings in transects B, C, and D increase with depth, indicating that groundwater transport is the likely mechanism, rather than direct discharge of wastes to the river. The conceptual site model that accounts for the sources, nature, and extent of benzene and cyanide described in the previous paragraphs does not explain the distribution of toluene.

Because benzene and toluene are both significant components of the heavy petroleum used in the manufacture of oil gas, we would expect the distribution of benzene and toluene in offshore groundwater to be similar, but they are not. Because benzene and toluene were both manufactured as separate products, as previously explained in this section, it is possible that the differences in their subsurface distribution is a function of separate releases associated with the manufacture of benzene and toluene. Because of the complex manufacturing and waste management history of the Site, it is not possible to be certain exactly why the distributions of these COIs are different.

The nature and extent of naphthalene in offshore groundwater shares some characteristics with the patterns of the benzene and toluene plumes. Figure 1.4e

shows high naphthalene concentrations associated with shallow sediment NAPL in shoreline transect A, similar to nearshore benzene occurrence. Figures 1.5e through 1.10e show that naphthalene also occurs at depth further offshore in a pattern similar to toluene, with groundwater transport resulting in higher naphthalene concentrations in the deepest groundwater samples. As described early in this section, crude naphthalene was manufactured as a product at the Site. The differences in distribution of the naphthalene plume may be a result of operations associated with that product. There is insufficient information on historic waste handling practices for the toluene, benzene, and naphthalene products to determine exactly if or how those practices have influenced the nature and extent of groundwater contamination.

As shown on Figures 1.4f through 1.10f, benzo(a)pyrene distribution in off-site groundwater is quite limited compared to naphthalene, although both compounds are PAHs. The 3-D profiles on Figure 1.19 illustrate the limited distribution and lower concentration of benzo(a)pyrene compared to naphthalene. Benzo(a)pyrene solubility in groundwater is much lower than naphthalene and benzo(a)pyrene preferentially adsorbs to aquifer solids. For these reasons, the presence of elevated benzo(a)pyrene concentrations in offshore groundwater is primarily associated with the occurrence of NAPL in shallow sediments. Although trace concentrations of benzo(a)pyrene are detected in some of the deeper groundwater samples, these are likely biased high due to the suspended solids content of the groundwater grab samples obtained in this investigation. The biased nature of the groundwater data due to the presence of suspended sediment in groundwater samples is further discussed in the following section on JSCS screening of the groundwater data.

1.4.4.2.1 JSCS Screening

All of the Phase 2 Step 1 and Step 2 groundwater data were screened against the Portland Harbor JSCS SLVs from JSCS Table 3-1 (DEQ and EPA 2005). The most conservative (i.e., lowest concentration) of the human health and ecological SLVs were used for screening against the groundwater data in Table 1.3. In Table 1.3, the groundwater concentrations exceeding the human health SLV are shaded in

yellow, concentrations exceeding the ecological SLV are shaded in blue, and values exceeding both criteria are shaded in orange.

Analytes exceeding one or more SLV at one or more boring location include:

Cyanides	**Metals**	**PAHs**	**VOCs**
Free cyanide	Aluminum	All	Benzene
Total cyanide	Antimony		Carbon disulfide
	Arsenic		Ethylbenzene
	Cadmium		Xylenes
	Chromium		Toluene
	Copper		Trichloroethene
	Lead		Vinyl chloride
	Manganese		
	Mercury		
	Nickel		
	Silver		
	Zinc		

It is important to consider the effect of sample suspended solids on the analyte concentrations when considering the quantitative value of the groundwater quality data in Table 1.3. The Step 1 and Step 2 samples were obtained using grab sample methods. All reasonable efforts were made in the field to minimize the suspended solid content of the samples. The nature of this type of sampling results in suspended solids content that is higher than is generally expected for samples from a monitoring well. The data on Table 1.2 show that turbidity levels in the samples were moderate to high because of the nature of the sampling method.

Selected groundwater samples were analyzed for both dissolved and total metals. For the samples where dissolved metals were tested, the frequency of SLV exceedances was much lower, and only arsenic and manganese were found to be above screening criteria. As typically occurs with this type of sampling, the

total metals concentrations are biased high because of suspended sediment in the samples. In addition to the effect of suspended sediment on metals concentrations, many of the SVOC and VOC concentrations are likely biased high due to suspended sediment in the groundwater samples. This is particularly true for the heavy weight PAH (HPAH) compounds, such as benzo(a)pyrene. The point of this discussion is not to discount the value of the data for determining the nature and extent of groundwater contamination, but to place limitations on the data for the purpose of numerical screening against JSCS SLVs.

Although many of the target analyte concentrations are likely biased high due to suspended sediment in the samples, the data are suitable for representation of the nature and extent of MGP-related COIs at the Site.

1.4.4.3 Sediment Chemistry

As discussed in the previous section, sediment samples were collected at depths of 0 to 2 feet, 5 to 7 feet, and 13 to 15 feet below mudline. The samples were submitted for laboratory bulk chemistry and grain size testing. The results of the sediment testing are in Table 1.4. As shown on Figure 1.3, three of the eight deep borings were located in the B transect, three in the C transect, and two in the D transect.

The sediment samples were visually screened for the presence of NAPL by Anchor personnel and further screened for NAPL by HAI personnel using the Ultraviolet Light Box. The findings from the NAPL screening are in Table 1.5.

All six of the B and C transect borings had sediment samples with visual detections of petroleum sheen, visual oil saturation, or positive indication of NAPL from the Ultraviolet Light Box. As described in previous sections, the NAPL present in offshore sediment is likely the result of historic direct discharge of MGP-related waste to the river. The maximum depth of NAPL detected was 10 feet below mudline in the B and C transects, except for boring GS-B7, where NAPL was detected in the 13 to 15 foot sample. There were no indications of NAPL in any of

the samples from the D transect. The NAPL detections are shown on subsurface profiles E-E′, F-F′, and G-G′ in Figures 1.14, 1.15, and 1.16.

As with the groundwater samples described in Section 1.4.4.2, the sediment subsurface profiles show the concentrations of total cyanide, benzene, toluene, naphthalene, and benzo(a)pyrene. Free cyanide was shown on the groundwater subsurface profiles, but is not shown on Figures 1.14, 1.15, and 1.16, because free cyanide cannot be tested in sediment. As expected, the concentrations of MGP-related COIs are much higher in the sediment samples that contain NAPL.

The sediment samples were not obtained from the same boreholes as the groundwater samples. This is because the barge mounted drill rig was remobilized to each deep boring location with sediment coring equipment. The sediment borings were located as close as possible to the groundwater borings within the limitations of the barge and drilling equipment.

The fact that the sediment samples from the deep borings are not exactly co-located with the groundwater samples, means that the sediment bulk chemistry (Table 1.4) and groundwater bulk chemistry data (Table 1.3) have limitations for the purpose of direct comparison of analyte concentrations. Because of the presence of NAPL in many of the samples, and the heterogeneous nature of sediment, it is typical to see a wide range in sediment bulk chemistry from samples that are obtained from only slightly different sample intervals.

1.4.4.4 Sediment Physical Properties

Sieve analyses were conducted on a representative number of the sediment samples, and the grain size data are summarized on Table 1.4. The subsurface sediment lithology profiles on Figures 1.11, 1.13, and 1.13 show the depth and lateral extent of sand and silt at the Step 2 boring locations. Section 1.4.4.1 provides more detail on shallow sediment lithology.

2 TRANSITION ZONE WATER TIDAL STUDY

A TZW tidal influence monitoring study was conducted in the Willamette River adjacent to Site. The DEQ requested this study to determine the potential variability in measured shallow sediment TZW chemical concentrations due to tidal fluctuations in the Willamette River. More specifically, the primary goal of this study is to determine if there is an inverse correlation between river elevation and COI concentrations in TZW. DEQ believes this information could allow a determination of whether shallow TZW chemical concentrations are tidally influenced, which it feels could help in the interpretation of Phase 2 offshore investigation TZW chemical concentration findings discussed in Section 1.

Following submittal of the Phase 2 Work Plan (Anchor 2007a), DEQ requested additional information regarding the variability in measured shallow sediment TZW chemical concentrations at the Site due to tidal fluctuations in the Willamette River. Per DEQ's request, NW Natural proposed to deploy four piezometer porewater samplers to collect shallow sediment TZW samples under a variety of tide conditions. To supplement this data collection, NW Natural proposed the collection of co-located sediment samples and near bottom surface water samples to provide additional lines of evidence regarding the potential source of observed TZW concentrations and potential correlation between observed co-located TZW and near bottom surface water concentrations. A summary of the data collection methods, analytical results, and results evaluation is presented below.

Concurrent with the TZW study, NW Natural conducted seepage meter monitoring at seven monitoring stations, three of which were approximately co-located with the TZW monitoring stations. This was conducted under a separate scope of work approved by DEQ detailed in the technical memorandum entitled *Proposed Groundwater Seepage Meter Deployment Scope of Work – Gasco Site* dated August 22, 2007 (Anchor 2007c). NW Natural proposed this additional study to provide additional lines of evidence for verifying groundwater discharge and providing general level estimates of groundwater discharge rates within the river sediments adjacent to the Site. The findings from the seepage meter study are presented in Section 4 of this report.

2.1 Sampling Methods

The TZW monitoring study methods are described in detail in the DEQ-approved technical memorandum entitled *Transition Zone Water (TZW) Tidal Influence Monitoring Study Scope of*

Work – Gasco Site dated August 22, 2007 (Anchor 2007d). NW Natural utilized the same type of piezometer porewater sampler used for the Gasco removal action pilot cap long-term monitoring. A detailed description of the piezometer sampler is provided in the EPA-approved *Monitoring and Reporting Plan* (MARP; Anchor 2006a). In summary, the piezometer is essentially a mini-wellpoint constructed of a heavyweight stainless-steel tube with a 4-inch screened interval at the tip. Teflon™-lined polyethylene tubing is connected to the end (opposite end of screened portion) of the piezometer and pumped to the surface using a peristaltic pump deployed from a vessel.

A single piezometer was installed at the four target stations (GS-B2, GS-B7, GS-C7, and GS-D5) shown in Figure 1.3. These stations were co-located with a subset of the Phase 1 and Phase 2 offshore investigation sampling locations, which were chosen to account for some of identified potential discharge areas along a variety of mudline elevations and across overall Site conditions. These piezometers were placed approximately 4 feet offset from the seepage meters (Section 4) to minimize potential sampling artifacts introduced by installation and operation of the seepage meter. At each of the four stations, a diver hand-pushed the midpoint of the piezometer screened interval to approximately 1.5 feet below the mudline. The piezometer was affixed at this depth by inserting three stabilizing rods into the sediment at an angle and affixing the rods to the piezometer several feet above the mudline elevation. The stabilizing rods were anchored into the sediment several feet from the piezometer to minimize potential sampling artifacts. Prior to deployment through the water column, the appropriate length of Teflon-lined polyethylene tubing was connected to the piezometer head and deionized water was pumped into the tubing and through the piezometer head space to minimize the introduction of river water (and any associated contaminants within the river water) into the sampler during installation. Once installed, the tubing was affixed to a floating buoy on the river surface to facilitate sampling access from a vessel.

At each monitoring station, TZW porewater samples were collected over an approximately 2-day period during two slack high tides, ebb tides, and slack low tides, as identified by a continuous-recording water level transducer installed at the Site during the deployment period. The TZW samples were retrieved from the Teflon™-lined polyethylene tubing using a peristaltic pump deployed from a vessel. At a minimum, one complete pore volume

of the full length of tubing was purged to remove the distilled water (prior to the first sample at each station) or previously pumped TZW during an earlier tidal cycle. The TZW samples at stations GS-C7 and GS-D5 were submitted for unfiltered analysis of the following parameters: metals (i.e., calcium, iron, magnesium, manganese, potassium, and sodium), anions (i.e., chloride, sulfate, and sulfide); alkalinity; total cyanide, amenable cyanide, and free cyanide; TOC; DOC; PAHs; and VOCs. Due to sample volume limitations at station GS-B7, only unfiltered metals and VOCs were analyzed. As discussed in Section 2.2, no TZW samples were collected from station GS-B2. Following each sampling event, the sampling tube was recapped to prevent the introduction of foreign materials.

Adjacent to each of the TZW sampling stations, a single bulk sediment sample was collected using a diver push core immediately following removal of the piezometer and stabilizing rods. Consistent with the TZW sample depth, the sediment samples were collected from a target depth of 1.5 to 2.0 feet below mudline or the bottom 0.5 centimeters (cm) of collected sediment if refusal was encountered before 2.0 feet. Each sediment sample was submitted for analysis of total cyanide, sulfide, TOC, total solids, grain size, metals, PAHs, and VOCs.

Concurrent with the TZW sample collection during each slack high and slack low tide condition over the approximately 2-day sampling period, a single near bottom surface water sample was collected. These samples were collected in addition to the cyanide surface water investigation discussed in Section 3. The near bottom surface water samples were collected approximately 1 foot above the mudline in the direct vicinity of the piezometer sampler using a van Dorn sampler deployed from a vessel. The near bottom surface water samples were analyzed for unfiltered alkalinity, chloride, sulfate, TSS, and metals.

In accordance with the TZW tidal influence study methods (Anchor 2007d), the following quality assurance/quality control (QA/QC) samples were collected during the monitoring event: a single field blank; a single trip blank on October 4, 5, and 12; and a rinsate blank from the piezometer and sediment core sampling equipment. The field blank was collected by directly pouring the laboratory-provided distilled water used for the rinsate blanks directly into laboratory-provided containers. The rinsate blanks were collected by decontaminating the sampling equipment, followed by rinsing the equipment and collecting the rinsate directly into laboratory-provided containers.

2.2 Sampling Methods Deviations

Several deviations from the methods identified in the *Transition Zone Water (TZW) Tidal Influence Monitoring Study Scope of Work – Gasco Site* (Anchor 2007d) occurred during the TZW monitoring study. These deviations, all of which were approved by DEQ, included the following:

1. NW Natural proposed that the TZW samples be field-filtered given the relatively coarse (i.e., approximately 1 millimeter) screen size of the piezometer. DEQ requested the collection of both filtered and unfiltered samples if filtering was conducted. Due to the volume limitations associated with the collection of both filtered and unfiltered samples, filtering was not conducted. No filtering was conducted during the Phase 2 offshore investigation TZW sampling discussed in Section 1.
2. TZW samples were proposed at station GS-B2 (Figure 1.3). During installation of the piezometer at this station, the diver noted the fine-grained sediment was stiff, creating difficulties with anchoring the piezometer stabilizing rods. Following installation of the piezometer, multiple attempts were made to pump TZW from this station without success. The sediment stiffness noted by the diver at this station indicates the sediment likely had a low permeability, which precluded collection via a peristaltic pump. The pumping difficulties were discussed with DEQ, and DEQ approved abandonment of this station.
3. TZW sample collection at station GS-B7 occurred at a very slow pumping rate relative to stations GS-C7 and GS-D5. This slower pumping prohibited the collection of sufficient sample volume for the full proposed analyte list defined in the scope of work (Anchor 2007d) during the defined tide conditions. The pumping difficulty was discussed with DEQ, and DEQ requested that the collected volume be analyzed for metals first and VOCs if time permitted. In addition, the slow pumping rate at this station, coupled with the relatively small sampling window within each tide condition, prohibited collection of TZW samples during each tide condition during the approximately 2-day sampling period.
4. Following finalization of the scope of work (Anchor 2007d), NW Natural proposed the collection of a single near bottom surface water sample at each TZW monitoring station approximately coincident with the TZW sampling (as discussed in Section 2.1). The objective of this additional data collection was to provide additional

information regarding the potential correlation between the co-located TZW and the near bottom surface water concentrations.

2.3 Results and Evaluation

TZW, bulk sediment, and near bottom surface water samples were successfully collected at three of the four proposed target stations over the encountered tidal conditions on August 4, 5, and 6, 2007 (Figure 1.3). The sample collection information for the TZW, bulk sediment and near bottom surface water samples are summarized in Tables 2.1 and 2.2. The analytical results for the TZW, bulk sediment, near bottom surface water, and QA/QC samples are summarized in Tables 2.3, 2.4, 2.5 and 2.6, respectively.

As requested by DEQ, the primary objective of this study was solely to determine if TZW COI concentrations are potentially inversely correlated to tidal variations. This study was not designed to determine the mechanisms of any identified correlations. Prior to evaluating whether the data showed an inverse correlation, it is important to note that TZW COI concentrations could be affected by a variety of Site conditions including sediment grain size, variable porewater COI concentrations, bathymetry (i.e., shallow benches, slopes, and deeper navigation channel), surface sediment chemical concentrations, groundwater seepage rates, regional rainfall, wake turbulence, and river tidal fluctuations. The TZW tidal influence study was not designed to account for each of these potential effects and therefore, the extent of their individual or combined influence on TZW concentrations cannot be evaluated. However, in an attempt to account for some of these potential effects, NW Natural volunteered to collect co-located surface sediment and near bottom surface water samples to evaluate the potential correlations with TZW concentrations.

The seepage study described in Section 4 of this report determined that there is no consistent correlation between river elevation and the rate of TZW discharge from the mudline. That study did show that TZW discharge varies cyclically several times daily, but that the variations are not consistently correlated with river tidal fluctuations.

A summary of the findings for each of the piezometer monitoring stations is presented in the following sections, including a discussion of Site conditions that may have affected the observed results. To facilitate review of the results, the TZW COI concentration data are

shown for a subset of detected COIs including metals (i.e., iron and calcium), cyanide (i.e., total cyanide), PAHs (i.e., acenapthene, fluoranthene, fluorene, naphthalene, phenanthrene, and pyrene), and VOCs (i.e., benzene, ethylbenzene, and m,p-xylenes). The remainder of the detected analytes show similar trends to these COIs. For stations with detectable COI concentrations, a linear regression was conducted between the COI concentrations and river elevations to determine the correlations between these variables. A negative (i.e., inverse) correlation indicates that the COI concentrations decrease as the river elevations increase, whereas a positive correlation indicates the opposite trend.

2.3.1 Transition Zone Water

2.3.1.1 Station GS-B7

Station GS-B7 is located along the nearshore slope approaching the navigation channel (Figure 1.3). The sediment type encountered was a silty clay that was much stiffer than the substrate encountered at stations GS-C7 and GS-D5. The diver indicated difficulty in installing the supporting rods necessary to support the piezometer assembly due to the substrate stiffness. The low substrate permeability limited the amount of sample volume collected at this station, resulting in a limited analytical suite. Consistent with the low permeability observed during the TZW sampling, the co-located seepage meter at this station showed groundwater discharge ranging between + 0.5 centimeter per day (cm/d) to -0.5 cm/d. This range is within the seepage meter measurement tolerance and therefore indicates this area showed no net groundwater discharge during the monitoring period. The observed low permeability substrate and lack of groundwater discharge at this station during the study period likely inhibits observations of potential variations in TZW concentrations caused by tidal variations.

Tidal effects caused the river elevation to range from a maximum of approximately 6.6 feet (City of Portland [COP] datum) to approximately 3.7 feet from October 4 to October 6, 2007 (Table 2.1). The river elevation changes and TZW concentrations for the metals and VOCs at station GS-B7 are summarized below:

1. Metals: Slight concentration variations in calcium (ranged from 52,100 to 59,100 milligrams per liter [mg/L]) and iron (ranged from 39,100 to 48,600 mg/L) were observed but no consistent correlation between these variations

and the tide elevations was observed (Figure 2.1). The linear correlation between the calcium and iron concentrations and river elevations was low with an R^2 ranging from -0.003 to -0.014 (Appendix G).

2. VOCs: Concentration variations in benzene (ranged from 0.19 to 0.36 μg/L), ethylbenzene (ranged from 0.36 to 0.6 μg/L,) and m,p-xylenes (ranged from 0.53 to 0.71 μg/L) were observed, but no consistent visual correlation between these variations and the tide elevations was observed (Figure 2.2). The linear correlation between the VOC concentrations and river elevations was low with a linear coefficient (R^2) ranging from +0.275 to -0.278 (Appendix G).

2.3.1.2 Station GS-C7

Station GS-C7 is located within the navigation channel (Figure 1.3). The sediment type encountered was a sandy silt. The diver had no difficulty installing the supporting rods necessary to support the piezometer assembly, and TZW sample collection (pumping) at this station was relatively easy, leading to the collection of the full suite of target analytes. The co-located seepage meter at this station showed a net mean groundwater discharge of 1.38 cm/d and a range in observed seepage between 0.88 cm/d to 3.00 cm/d. The observed sediment permeability and net mean groundwater discharge at this station during the study period facilitates observations of potential correlations between TZW concentrations and river elevation variations.

Tidal effects caused the river elevation to range from a maximum of approximately 6.6 feet (COP datum) to approximately 3.7 feet from October 4 to October 6, 2007 (Table 2.1). The river elevation changes and TZW concentrations for the metals, total cyanide, PAHs, and VOCs at station GS-C7 are summarized below:

1. Metals: Concentration variations in calcium (ranged from 49,900 to 60,900 mg/L) and iron (ranged from 37,200 to 48,000 mg/L) were observed but no consistent visual correlation between these variations and the tide elevations was observed (Figure 2.3). The linear correlation between the calcium and iron concentrations and river elevations was low with an R^2 ranging from 0.086 to 0.123 (Appendix G).

2. Total cyanide: Concentration variations in total cyanide (ranged from 0.26 to 0.47 mg/L) were observed, but no consistent visual correlation between the observed tide elevations was observed (Figure 2.3). The linear correlation between total cyanide concentrations and river elevations was moderate with an R^2 of -0.526 (Appendix G). As shown above, the range in total cyanide concentrations is relatively narrow, which may serve to increase the observed correlation. Note that there were no identified detections of TZW free cyanide and a single detection of amenable cyanide at 0.07 mg/L (slack low tide on October 5, 2007).
3. PAHs: Concentration variations in acenapthene (ranged from 290 to 680 μg/L), fluoranthene (ranged from 33 to 310 μg/L), fluorene (ranged from 70 to 150 μg/L), naphthalene (ranged from 9,500 to 15,000 μg/L), phenanthrene (ranged from 160 to 790 μg/L), and pyrene (ranged from 34 to 310 μg/L) were observed over the tide conditions (Figure 2.4). On October 4, 2007, the observed COI PAH concentrations increased as the river elevations decreased. However, this trend was not visually observable for any of the COI PAH concentrations on October 5, 2007. The linear correlation between the COI PAH concentrations and river elevations was low with an R^2 ranging from -0.102 to 0.042 (Appendix G).
4. VOCs: Concentration variations in benzene (ranged from 2,300 to 4,800 μg/L), ethylbenzene (ranged from 360 to 690 μg/L), and m,p-xylenes (ranged from 210 to 380 μg/L) were observed over the tide conditions (Figure 2.5). Over each tidal cycle, the slack high tide showed lower concentrations than the slack low tide, but the ebb tide, which had higher river elevations than the slack low tide, showed higher concentrations than the slack low tide. The linear correlation between the COI VOC concentrations and river elevations was moderate with an R^2 ranging from -0.400 to -0.435 (Appendix G).

2.3.1.3 Station GS-D5

Station GS-C7 is located within the navigation channel (Figure 1.3). The sediment type encountered was a sandy silt. The diver had no difficulty installing the supporting rods necessary to support the piezometer assembly, and TZW sample collection (pumping) at this station was relatively easy leading to the collection of

the full suite of target analytes. The co-located seepage meter at this station showed a net mean groundwater discharge of 1.47 cm/d and a range in observed seepage between -0.38 cm/d to 4.59 cm/d. The observed sediment permeability and net mean groundwater discharge at this station during the study period facilitates observations of potential correlations between TZW concentrations and river elevation variations.

Tidal effects caused the river elevation to range from a maximum of approximately 6.6 feet (COP datum) to approximately 3.7 feet from October 4 to October 6, 2007 (Table 2.1). The river elevation changes and TZW concentrations for the metals, total cyanide, PAHs, and VOCs at station GS-D5 are summarized below:

1. Metals: Concentration variations in calcium (ranged from 90,600 to 107,000 mg/L) and iron (ranged from 55,500 to 72,000 mg/L) were observed, but no consistent visual correlation between these variations and the tide elevations was observed (Figure 2.6). The linear correlation between the calcium and iron concentrations and river elevations was low with an R^2 ranging from 0.151 to 0.252, respectively (Appendix G).
2. Total cyanide: Concentration variations in total cyanide (ranged from non-detect to 0.06 mg/L) were observed during some tide conditions, but no consistent visual correlation between the observed tide elevations was observed (Figure 2.6). A linear correlation was not conducted due to three of the six tide conditions showing no detectable concentrations. Note that there were no identified detections of TZW free cyanide and a single detection of amenable cyanide at 0.004 mg/L (slack low tide on October 6, 2007).
3. PAHs: Slight concentration variations in acenapthene (ranged from 9.2 to 11.0 μg/L), fluoranthene (ranged from 0.10 to 0.16 μg/L), fluorene (ranged from 1.6 to 2.4 μg/L), naphthalene (ranged from non-detect to 0.11 μg/L), phenanthrene (ranged from 0.99 to 1.6 μg/L), and pyrene (ranged from 0.071 to 0.15 μg/L) were observed, but no consistent visual correlation between these variations and the tide elevations was observed (Figure 2.7). The linear correlation between the PAH concentrations and river elevations was higher than other stations, with an R^2 ranging from -0.558 to -0.820 (Appendix G). The low magnitude and narrow range of observed concentrations indicate

that this inverse correlation is likely a product of the low level of detections, rather than a physical relationship.

4. VOCs: No detectable concentrations of benzene, ethylbenzene, and m,p-xylenes were observed over the tide conditions.

2.3.1.4 All Stations

Comparison of the observed concentrations at each monitoring station over the range of tide conditions provides a useful understanding of the spatial variation in measured TZW concentrations during the study period. A summary of the observed COI concentrations across all monitoring stations is provided below and depicted in Appendix H.

- Metals: The calcium and iron concentrations were generally similar at stations GS-B7 and GS-C7 and slightly more elevated at station GS-D5.
- Total cyanide: Station GS-C7 showed consistently higher concentrations than station GS-D5. Total cyanide was not measured at station GS-B7.
- PAHs: Station GS-C7 showed consistently much higher concentrations than station GS-D5.
- VOCs: Station GS-C7 showed consistently significantly higher concentrations than station GS-D5.

The compiled TZW concentrations do not show a consistent general trend in COI concentration variations across all stations (Appendix H). The metals concentrations are generally similar at stations GS-B7 and GS-C7 and slightly higher at station GS-D5, whereas the total cyanide, PAH, and VOC concentrations are consistently significantly higher at station GS-C7 compared to station GS-D5. As discussed below, these spatial variations can at least be partially attributed to the observed bulk sediment concentrations.

2.3.2 Sediments

The bulk sediment samples showed detectable concentrations of total cyanide, metals, PAHs, and select VOCs at each of the monitoring stations, as shown in Table 2.4. A summary of the detected concentrations for each COI is summarized below.

- Metals: Generally similar concentrations at stations GS-C7 and GS-D5 and slightly more elevated concentrations at station GS-B7.
- Total cyanide: Similar concentrations at stations GS-B7 and GS-C7 and non-detectable concentrations at station GS-D5.
- PAHs: Orders of magnitude differences in observed concentrations with increasing concentrations from station GS-D5 to GS-B7 to GS-C7.
- VOCs: Orders of magnitude differences in observed concentrations with increasing concentrations from station GS-D5 to GS-B7 to GS-C7.

Comparison of the bulk sediment COI concentrations to the TZW COI concentrations in Tables 2.3 and 2.4, respectively, clearly shows a positive correlation between TZW concentrations and bulk sediment concentrations for total cyanide, all PAHs, and detected VOCs. This positive correlation at least partially contributes to the spatial variations in observed TZW concentrations discussed in Section 2.3.1.4 and may act to mask any potential correlations between TZW concentrations and river tidal elevations.

2.3.3 Near Bottom Surface Water

The near bottom surface water samples showed detectable concentrations of select metals, as shown in Table 2.5. The near bottom surface water samples were not analyzed for cyanide, PAHs, or VOCs. The tide variations and measured near bottom surface water metals concentrations at each monitoring station are summarized below.

- Station GS-B7: The calcium and iron concentrations showed visually observable correlations with the tide elevations over the three tide conditions (Figure 2.8).
- Station GS-C7: The calcium and iron concentrations showed no visually observable correlations with the tide elevations over the three tide conditions (Figure 2.9).
- Station GS-D5: The calcium and iron concentrations showed no visually observable correlations with the tide elevations over the three tide conditions (Figure 2.10).

The observed near bottom surface water calcium concentrations at each station during each tide condition were compared to the observed TZW calcium and iron concentrations to determine if the between media concentrations were correlated. As

shown in Appendix I, only the calcium and iron concentrations at station GS-B7 showed a strong positive correlation (i.e., R^2 of 0.951 and 0.832, respectively) between increases in near bottom surface water concentrations and increases in TZW concentrations. The limited number of data points (three samples) and narrow range of observed concentrations indicate that this inverse correlation is a product of the data evaluation, rather than a physical relationship.

2.4 QA/QC Samples

As shown in Table 2.6, the field blank, piezometer rinsate blank, and sediment core rinsate blank all showed low-level detections of PAHs and VOCs above the MRL. In addition, the piezometer and sediment core rinsate blank showed a low-level detection of iron. Each of the three trip blanks showed no detectable concentrations of VOCs. All data was deemed useable as qualified. No data was rejected for these samples.

2.5 Comparison of TZW Concentrations – Tidal Study and Phase 2 Offshore Investigation

Each of the stations sampled during the tidal study were approximately co-located with shallow sediment TZW samples collected during the Phase 2 offshore investigation. The TZW concentrations observed during both investigations are provided in Appendix J and summarized below for each of the COIs to determine if there were any apparent visual correlations.

2.5.1 Metals

The TZW metals concentrations for each of the monitoring stations are summarized below:

- Station B7 – The TZW metals concentrations in the Phase 2 offshore investigation are consistently much higher than those observed during the tidal study.
- Station C7 – The calcium, magnesium, potassium, and sodium concentrations are consistently slightly higher in the Phase 2 offshore investigation, whereas the iron and manganese concentrations are consistently slightly higher during the tidal study.
- Station D5 – All metals except sodium are consistently significantly higher during the tidal study.

2.5.2 PAHs

The PAH concentrations for each of the monitoring stations are summarized below:

- Station B7 – No PAH data was collected during the tidal study.
- Station C7 – The concentrations were consistently higher during the tidal study and significantly higher for naphthalene.
- Station D5 – The majority of the PAH analytes in the Phase 2 offshore investigation were higher than the tidal study.

2.5.3 VOCs

The VOC concentrations for each of the monitoring stations are summarized below:

- Station B7 – No VOC data was collected during the tidal study
- Station C7 – For all detected VOCs, the concentrations were significantly higher during the tidal study.
- Station D5 – Both the tidal study and Phase 2 offshore investigation contained only low level detections (most were J flagged) that were of similar magnitude. The Phase 2 offshore had detections of a greater number of VOC analytes.

Comparing the TZW data from the tidal study piezometer samples and the Phase 2 offshore samples indicates that there are no consistent TZW concentration variations across all COIs and monitoring stations. There are, however, consistent trends for particular analyte groups at a particular station. This information does not suggest that widespread sampling artifacts were created via potential minor differences in sampling methods used during the tidal study and Phase 2 offshore investigations.

2.6 Summary

TZW, bulk sediment, and near bottom surface water samples were successfully collected at three of four planned monitoring stations. The TZW concentrations did not show a consistent correlation with variations in tide conditions for any of the COIs across the three sampling stations. Some of the COIs did show moderate to strong correlations with river elevation changes at some of the sample stations but these correlations were likely affected by the relatively low concentrations observed, the narrow range in observed concentrations, or the limited data. TZW COI concentrations and sediment COI concentrations show a strong correlation for total cyanide, all PAHs, and detected VOCs. The near bottom surface

water concentrations did not show a consistent correlation with the co-located TZW concentrations. Comparing the TZW data from the tidal study piezometer samples and the Phase 2 offshore samples indicates that there are no consistent TZW concentration variations across all COIs and monitoring stations.

3 CYANIDE SURFACE WATER INVESTIGATION

In October 2007, Anchor conducted a detailed evaluation of the nature and extent of free, amenable, and total cyanide in the Willamette River water adjacent to the Site. This program supports the overall evaluation of potential groundwater sources and source controls. The sampling was conducted according to the *Final Cyanide Surface Water Investigation Field Sampling Plan* (FSP; Anchor 2007e). The FSP (including NW Natural's responses to DEQ comments on the Draft FSP made by DEQ) is provided as Appendix K.

3.1 Background

Analytical results from Site groundwater investigations indicate concentrations of total cyanide (and very infrequently, free cyanide) exist in a portion of the shoreline groundwater samples above DEQ JSCS screening values. However, as discussed later in this section, comparison of total cyanide to free cyanide-based criteria in the JSCS is inappropriate. Section 1 of this report provides a detailed analysis of the findings of the groundwater investigation, including screening of the groundwater data against JSCS criteria. Relatively elevated total cyanide concentrations in groundwater are not representative indicators of the actual exposure of human or ecological receptors to bioavailable free cyanide in surface water, which is by far the most toxic form of cyanide. Cyanide's relative toxicity is determined by the distribution of its different species or forms. Site water investigations utilize three categories of analytical methods to evaluate the following cyanide species: free, amenable, and total.

The forms of cyanide that exist at the Site are linked both to the nature of the source and site-specific geochemical characteristics. Free cyanide, the most biologically available and toxic form, is a measure of the sum of the cyanide anion (CN-) and hydrogen cyanide (HCN). Amenable cyanides are those cyanides "amenable to chlorination" that undergo oxidation and dissociation to free cyanide when exposed to chlorine. The amenable cyanides method may represent a reasonable measure of the cyanide that could become available as free cyanide under certain environmental conditions, which are not necessarily present at the Site. Total cyanide encompasses all cyanide categories including free and amenable as well as other forms sometimes studied, such as available and strong acid dissociable (e.g., iron cyanide).

At the Site, free cyanide has previously been measured to be typically 1 to 8 percent of the measured total cyanide in shoreline and offshore groundwater (see Section 1). Due to high iron levels in the groundwater, and as is typical for MGP sites, a large portion of the measured total cyanide is complexed with iron in a stable iron cyanide form (Anchor 2007b).

3.2 Objectives

Results of this sampling aid in understanding cyanide species in surface water and the potential connection of any measured surface water cyanide concentrations with the concentrations identified in upland groundwater and TZW. The potential Site-related sources of cyanide in surface water include: 1) discharge from sediment TZW; and 2) resuspension of sediments impacted by historical direct discharges of cyanide-containing materials. It is also possible that surface water contains cyanide from naturally occurring sources and/or upstream industrial/urban sources. Coupled with the Phase 2 Offshore Investigation TZW data also collected (Section 1), the objectives of the cyanide surface water investigation were:

- Primary objectives
  - Evaluate the potential for transport of cyanide measured in Site groundwater and TZW to surface water and any conversion to free cyanide under select river conditions.
  - Collect data that may be useful for assessing in-river risks from cyanide (i.e., low tide versus high tide conditions and/or river current velocity and direction).
- Secondary objectives supporting the primary objectives
  - Determine the concentration of cyanides in surface water near potential groundwater discharge zones identified in the TZW study conducted by the LWG.
  - Compare concentrations of cyanide measured in surface water to shoreline groundwater, with a focus on those monitoring wells showing elevated cyanide concentrations, to determine if a correlation exists.
  - Assess the relative contribution of cyanide sources (i.e., contaminated sediment resuspension versus TZW) to be the cause of cyanide concentrations observed in surface water.

- Evaluate cyanide measured in surface water in conjunction with uplands groundwater data.

Some of these secondary objectives in particular can only be assessed if substantial cyanide is detected in surface water that would allow a determination of potential patterns associated with groundwater discharges, upland groundwater data, and sediment resuspension versus TZW discharge. As discussed below, cyanide species were infrequently detected, making some of these comparisons difficult or impossible.

3.3 Sampling Methods

In general, methods followed the FSP unless otherwise noted here. Detailed descriptions of sampling procedures and reasons behind those procedures are provided in the FSP (Appendix K). Surface water sampling activities occurred during the summer work window of July 1 through October 31 when groundwater discharges should be measurable if they are occurring. Field work began October 1, 2007 and was completed October 10, 2007. DEQ personnel were on site October 3, 2007 to observe sampling at station GSW-09. River water sampling equipment was deployed from the side of a shallow draft vessel.

In addition to free, amenable, and total cyanide, measurements of pH, temperature, turbidity, ORP, conductivity, and dissolved oxygen were recorded in the field. The FSP proposed to collect field parameters at approximately the same time as the van Dorn sampler for cyanide samples was deployed. Field parameters were measured by the water quality meter immediately prior to disturbing the water column, and potentially the river bottom, with the sampler. Iron, sulfides, and conventionals (i.e., TSS and TOC) were also measured in the laboratory.

Twenty river water sample stations are indicated by green triangle symbols on Figure 1.3. Surface water samples were collected at three depth intervals at each station sampled as described in the FSP. Samples were collected from all 20 target coordinates shown in Table 3.1 and Figure 1.3. Two upriver sample stations and two downriver stations were also sampled in order to evaluate background levels and dilution of potential cyanide sources from the Site. Each station (at all depth intervals) were sampled during each of three approximate tidal events: ebb tide (on an outgoing tide), slack high tide (the time

surrounding the peak of the tide), and slack low tide (the time surrounding the nadir of the tide). As described in the FSP (Appendix K), it is not possible for all 20 sampling stations to be sampled at each of the three depth intervals during one complete tidal cycle (i.e., one day). Therefore, groups of stations were sampled over the course of several sampling days until each station was sampled for all three tidal conditions.

Sampling was conducted as depicted in Figure 3.1a. The exact number and order of the samples collected varied slightly from the schedule proposed in the FSP, where assumptions were made based on predicted tide schedules, sampling speed, and length of the available sampling day. Figure 3.1b provides a plot of sample times compared with river elevations and general river flow direction as measured by the Acoustic Doppler Current Profiler (ADCP) deployed at GSW-13 (discussed further below). Figure 3.1b shows that, despite some of deviations from the FSP in terms of the sequence of sampling stations and tidal events, water samples were obtained over a representative range of tidal cycles during the study period.

Both filtered and unfiltered water samples were collected at each sampling location in order to assist in understanding the potential for contaminated sediment resuspension sources and to assess the potential for sample contamination caused by sediment resuspension during the collection of the near bottom sample.

Using real-time upward facing ADCPs, current speed was measured at three cyanide surface water stations (Figure 1.3) to establish the general direction and velocity of water beginning at the end of the first sampling day (October 1, 2007) and ending after the sampling was completed. ADCP "B," at GSW-13, was offset upstream approximately 20 feet from the target to avoid a seepage meter placed at GSW-13.

3.3.1 Sampling Deviations

Instead of an independent crew conducting velocity measurements, river current data were collected with remote ADCPs. This method provides a more accurate description of the currents at each station over the entire sampling period and can therefore be compared to the measured river elevations at the Site to assist in understanding the overall river system.

The FSP noted that Hydrolab Multiprobe calibration checks would be made daily. Parameter readings remained consistent throughout the sampling event as tested using standard reference materials and were confirmed with calibration checks every two days. Elevated pH readings were noted on October 9, the last day on which samples were collected. Attempts to calibrate the pH probe were unsuccessful and thus pH readings for the three samples collected on October 9 should be considered estimates (noted in Table 3.2).

The van Dorn Sampler design utilized was a modification to that proposed in the FSP. The FSP described that the camera would be farther away from the bottom of the sampler than any other equipment to view the river bottom prior to hitting it. However, the camera was attached below the sampler facing down at the river bottom so that field crew could watch as the lead weight made contact with the mudline. The sampler was lowered slowly toward the bottom. With the camera, the field crew could see the lead weight contact the mudline. Following contact of the lead weight, the crew could watch the clearing of suspended sediments prior to taking the sample.

The FSP proposed replicates to be collected at 5 percent frequency. Field replicates were inadvertently not collected, thus omitting nine replicate samples. This information was not realized until after the sampling program was complete. However, as stated in the FSP, the river is a dynamic environment with continually moving water and there would be inherent variability within each replicate grab (as proposed in the FSP).

3.3.2 Laboratory Testing and Data Validation

The analytical laboratory selected for this project was CAS in Kelso, Washington. All sample analyses were conducted in accordance with DEQ-approved methods already employed at the Site. Appendices M and N present the analytical laboratory reports and data validation reports, respectively.

Prior to sampling, DEQ suggested that NW Natural look into another analytical laboratory (Test America) for cyanide testing, due to the possibility of achieving a MRL

for free cyanide of 3 μg/L (lower than the 5 μg/L method detection limit and 10 μg/L method reporting limit from CAS). Anchor reviewed information received from Test America regarding the cyanide methods. Anchor was not convinced that the suggested free cyanide MRL of 3 μg/L is consistently achievable given the limits of the analytical technology being utilized for analysis (i.e., Spec 20). However, Test America informed Anchor that the sampling frequency of the program exceeded their daily capacity and they could not handle the volume, given the short hold times. As such, samples were analyzed by CAS, the laboratory used for other testing at the Site.

The standard holding time used for Gasco investigations for free cyanide analysis is 48 hours. The FSP proposed a holding time of 24 hours for this analysis, but this is based on the assumption that samples are not preserved in the field. All samples were field preserved. All free cyanide sample analyses met the 48-hour holding time (time to microdiffusion). Moreover, approximately 40 percent of the free cyanide samples were in microdiffusion within 24 hours.

3.4 Results of the Cyanide Surface Water Investigation

The following subsections summarize the results of the sampling conducted for the cyanide surface water investigation. Interpretation of these data in context of the objectives of this study (as outlined in Section 3.2) to the extent data allow this, is presented in Section 3.5. In addition, Section 3.5 presents an overall evaluation of the potential for cyanide in-river risks as indicated by both surface water and shallow TZW data. Field data collected as part of the cyanide study are presented in Appendix L, analytical lab reports in Appendix M, and data validation reports in Appendix N.

3.4.1 Field Parameters

River elevations as recorded by the Site transducer during the sampling period are depicted in Figure 3.1a. Actual tide window starting times and the length of tide windows were observed to be fairly close to those predicted using the predicted river elevation.

At each of the 20 cyanide stations, water depths for the three associated samples (near surface, mid-depth and near bottom) were recorded and are depicted in Figure 3.2 for

the three tide windows. The water depths of mid-depth samples ranged from 13 to 27 feet deep (GSW-06 and GSW-07, respectively); while near bottom water depths ranged from 25 to 54 feet deep (GSW-06 and GSW-05, respectively). The mid- and near bottom depths at a given station varied by a few to several feet depending on the tide window (i.e., slack high versus slack low) as well as whether the sample was collected during a more extreme tide than the other samples at that station (i.e., high low tide versus a low high tide).

Overall, pH levels were neutral, ranging from 6.4 to 7.5, with generally higher pH measured in the shallow depth interval (Table 3.2; Figure 3.3). Though the maximum measured pH value of 7.5 is an estimated value considering calibration issues in the field, other pH measurements at or above 7 were recorded. Measured ORP is also shown on Figure 3.3 and ranged from 356 to 453 mV. Conductivity (measured from 84.1 to 119.2 uS/cm) and temperature (measured from 13.5 to 16.1° C) are depicted in Figure 3.4, and dissolved oxygen (measured from 8.8 to 10.1 mg/L) and turbidity (measured from 0 to 5.9 nephelometric turbidity units [NTUs]) results are in Figure 3.5.

3.4.2 Acoustic Doppler

Approximate current direction and velocity readings by depth for each of the three ADCPs were averaged over the vertical profile. This averaging resulted in one measurement per 15 minutes per ADCP. The ADCPs began recording at 10-minute intervals and then switched to 15-minute intervals for the majority of the sampling duration.

As shown on Figure 1.3, ADCP A was co-located at cyanide station GSW-18 and Phase 2 station GS-C9. ADCP B was co-located with GSW-13 and GS-B5, while ADCP C was co-located at GSW-04. Figure 3.6 summarizes the number of readings (averaged over the water column) at each ADCP that fall within four directional categories. This figure shows that most of the time, the river water at each station was measured to be flowing downriver (northwest). This frequency chart also shows that ADCP A (located upriver) has a more evenly distributed frequency of readings, suggesting the most change in river flow between all ADCP stations. These results could potentially be explained by eddies and/or tidal cycling. Average directional readings are mapped with river

elevations in Figures 3.7a, 3.7b, and 3.7c for ADCP A, ADCP B, and ADCP C, respectively. The cyanide surface water samples collected at those cyanide stations are also plotted on the figures for reference as to the directional reading measured at the time of collection.

Fairly consistently, the average river direction switched from the northwest flow to a southeast flow (upriver as shown on Figure 1.3). However, as shown in Figure 3.7a, ADCP A (upriver from Site and further offshore than the other two ADCPs) seems to show less consistency in direction changes when compared to river elevation cycles.

Reverse flow was observed in the field during sampling and is confirmed by the ADCPs (Figures 3.7a through c). Water samples were collected at some stations and depths during reverse flow.

Average river velocity was slightly higher mid-shore and downriver than at nearshore or upriver stations. Velocity fluctuation and magnitude at the mid-Site station and the downriver station are similar and show relatively consistent cycling that follows river elevations (Figures 3.8a through c). ADCP A (upriver and offshore) velocities appear to have less consistent fluctuations for both timing and magnitude.

3.4.3 Chemistry

The following subsections provide the results for free, amenable, and total cyanide, along with TSS, sulfides, iron, and DOC/TOC. Analytical results are presented in three tables grouped by depth, then by tidal cycle. Table 3.3 presents the results of near surface samples, Table 3.4 includes the mid-depth results, and Table 3.5 presents results for the near bottom samples. Average direction and velocity measurements are included in these tables. As the ADCP data are averaged over the vertical column for each station, measurements are the same in the near surface, mid-depth and near bottom analytical tables. For surface water stations that do not have a co-located ADCP, the measurements of the closest ADCP are shown.

3.4.3.1 Cyanide

Results for all stations, all depths, all tides by both filtered (Figure 3.9a) and unfiltered (Figure 3.9b) analyses were non-detect for free cyanide (out of 360 samples collected; 180 unfiltered and 180 filtered). Free cyanide is the most relevant species of cyanide with respect to potential exposure of receptors to river water. As discussed in Section 3.3.2, the method detection limit for free cyanide analysis was reported to be 5 μg/L, below the JSCS criteria for the protection of ecological receptors of 5.2 μg/L. The reporting limit for the method (ASTM D4282) was reported to be 10 μg/L. Several samples, including the method blank, showed preliminary results (i.e., not final and not validated) of free cyanide detected at concentrations at or slightly above the MDL. However, upon validating the data, these results were reported as non-detect at 10 μg/L because the sample detection levels were at or below the detections in the method blanks (consistent with EPA validation guidelines).

Amenable cyanides were analyzed via standard method 4500 with an MDL of 3 μg/L and a reporting limit of 10 μg/L. The FSP listed ASTM 335.1 as the proposed analysis method for amenable cyanide. CAS reported the amenable cyanide results based on the method SM 4500-CN E. The laboratory standard operating procedure (SOP; GEN-335 Revision 11) encompasses both methods; therefore, there were no differences in laboratory protocol between these two methods.

There were 13 detects of amenable cyanide out of 360 samples (Figures 3.10a and 3.10b) and most were at or below 10 μg/L. Detects include samples collected from GSW-01 slack high tide (downriver from the Site). Only three samples had detectable levels of the dissolved fraction of amenable cyanide (Figure 3.10a) with a maximum of 110 μg/L at GSW-09 collected during the ebb tide at near bottom depth (mid-Site, nearshore). Unfiltered amenable cyanide at that same station, depth, and tide was reported at 10 μg/L (Figure 3.10b). Although the unfiltered sample being lower than the filtered sample is somewhat unexpected, such variations are not unusual for surface water sampling events and potential artifacts created by field filtering procedures. Because this pattern does not occur repeatedly within the

dataset, there is no indication of any systematic sampling artifact created by the sample collection or filtering process.

The two other detects of dissolved amenable cyanide were along the nearshore transect: 3 μg/L at GSW-17 shallow depth during the slack low tide and 10 μg/L at GSW-11 shallow depth during ebb tide. The maximum detect of 90 μg/L for unfiltered amenable cyanide was measured at GSW-15 collected during the ebb tide at mid-depth (upriver within the Site and nearshore).

There were 15 detects of total cyanide (out of 360 samples collected) measured via EPA 335.4. Only four samples (three stations) had detectable levels of the dissolved fraction of total cyanide with a maximum dissolved total cyanide concentration of 140 μg/L detected in the near bottom depth interval of GSW-09 sampled on the ebb tide (Figure 3.11a). The unfiltered fraction at that same station, depth, and tide was detected at 10 μg/L (Figure 3.11b). A similar result occurred at this station for amenable cyanide, and as noted above, this does not appear to be related to any systematic bias within the sampling or filtering procedure. The remaining three detected concentrations of total cyanide from the filtered analyses were at or below 10 μg/L. The JSCS defines a Portland Harbor-specific SLV for total cyanide as 14 μg/L dissolved based on EPA's AWQC of 140 μg/L total cyanide. However, as EPA acknowledges, the oral reference dose (RfD) used in deriving the water quality criterion is actually based on exposure to free cyanide, and therefore, the SLV is overprotective of total cyanide concentrations. Comparisons to appropriate SLVs are discussed further in Section 3.5.

3.4.3.2 Other Analytes

The field crew made observations of turbidity levels using the Hydrolab water quality probe and the visual output of the underwater camera as it approached the target depth in the river. As previously described, the field crew used the underwater camera to determine when turbidity returned to ambient levels, prior to sampling. As such, measured TSS summarized in this section should be representative of ambient river water. The maximum detected TSS (14 mg/L) was measured in the near bottom depth interval at GSW-09 collected during slack low

tide. At this location, depth, and tide of the highest measured TSS, all cyanide species (dissolved or total fractions) were not detected. In general, the TSS at stations where cyanide was detected in the near bottom depth interval (three stations) was either non-detect or detected at concentrations less than 10 mg/L. This suggests that there is not a strong correlation between TSS and cyanide concentrations in water. Further evaluation of a potential correlation between TSS and cyanide concentration is presented in Section 3.5.2. TSS is measured in the laboratory by filtering sample water and weighing the solids that do not pass through the filter. The filter size used in standard TSS analysis (1.2 microns) is larger than that of the filter used in the field for the collection of filtered surface water (0.45 microns). This suggests the possibility that there are solids in the whole water that are not being captured by TSS analyses.

No sulfides were detected in any of the cyanide surface water samples. Dissolved iron was detected in 84 percent of the samples with concentrations ranging from 29.1 to 82 μg/L (Figure 3.12a) with no clear relationship between concentration, depth, or tide intervals (Figure 3.13). Concentrations were fairly similar between the depth intervals. The maximum detected dissolved iron concentration was measured at the most downriver station (GSW-01, ebb tide, mid-depth). Total iron was detected in every cyanide surface water sample at concentrations ranging from 167 to 438 μg/L (Figure 3.12b) with concentrations generally slightly higher in the near bottom depth interval (data points represented by squares on Figure 3.14). Levels of dissolved iron do not appear to be explained by levels of total iron at the same station and sampling event (Figure 3.15).

As shown in Figure 3.16, both DOC and TOC concentrations are similar in magnitude with DOC concentrations from 1.5 to 3.1 mg/L, while TOC was measured from 1.4 to 2.7 mg/L.

3.5 Data Interpretation

There are no detects of free cyanide in river water collected at any depth or tide interval. Free cyanide is the most relevant species with respect to potential exposure of receptors to river water. Moreover, there are very few detects of other cyanide species in the overall

dataset (less than 5 percent detection frequency of all filtered and unfiltered samples for all cyanide species at all depth and tide intervals, a total of 780 tests). Therefore, evaluations to confirm or reject any potentially statistically significant relationships between detected levels of cyanide and the numerous variables discussed in Section 3.1 of this report are not as possible as if there were a higher frequency of detections for cyanide. Further, where cyanide species are detected, they are generally near or below the MRL. At these low levels, analytical precision is known to be poor. Thus, any potential patterns of relative concentration differences are most likely caused by variations in analysis precision. However, general patterns of cyanide concentrations and what those data might suggest about cyanide sources are explored in the following sections.

3.5.1 General Patterns of Cyanide Concentrations

Cyanide results were reviewed to identify any potential patterns in the data, either spatially (horizontally along the river or vertically along depth intervals), temporally (slack low versus slack high versus ebb tide) or in speciation (free cyanide versus total cyanide). Given that free cyanide was not detected, variations in speciation were not explored further. However, it is notable that free cyanide was not detected in near surface (shallow depth) water samples where photolytic conversion from total cyanide to free cyanide, if present, would be expected to take place.

3.5.1.1 Spatial Horizontal

Cyanide results are graphically depicted on Figures 3.9a through 3.11b. Due to the dynamic nature of surface water flows, which can carry any detected chemicals large distances in short periods of time, great care must be taken in relating spatial variations in surface water to chemicals present in sediments or TZW.

There is approximately the same frequency of low detection for cyanide (both amenable and total) in the nearshore samples (transect B) and the offshore samples (transect C). Of the few surface water cyanide detects, a higher frequency (and magnitude) of detects was measured along the middle portion of the shoreline (e.g., between stations GSW-09 and GSW-15), although there are a few detected concentrations of cyanide in other upriver or downriver stations as well.

Results of all surface water cyanide analyses (at all depths and at all tide events) were non-detect in upriver samples (stations GSW-19 and -20), suggesting that there is no detectable concentration of cyanide (of any form) in surface water upriver from the Site. Cyanide was also non-detect at upriver stations GSW-19 and -20, sampled during conditions of reverse river flow as recorded by Site ADCPs during the time of sampling.

At downriver stations, there was one series of surface water detects for both unfiltered amenable and total cyanide (dissolved fractions were non-detect) at the farthest away of the two downriver stations (GSW-01) during downstream river flow. The concentrations detected are minimal (at or below the reporting limit of 10 μg/L). In contrast, the most downstream station still adjacent to the Site (GSW-03) had no detects of any species of cyanide in surface water.

3.5.1.2 Spatial Vertical

As there are no detected concentrations of free cyanide in surface water, there are no vertical patterns to evaluate for this form of cyanide. In general, average cyanide concentrations for all species from shallow depths were detected at slightly lower concentrations than those from mid- or near bottom depth intervals. There are only a few stations where cyanide (in one form or another) was detected at more than one depth interval. In such cases, the near bottom depth interval had higher concentrations of cyanide than the shallower interval, potentially indicating some relationship with proximity to the sediment surface.

3.5.1.3 Temporal

Overall, there are more frequent and higher cyanide detects in water collected during the ebb (outgoing) tide as shown in red on Figures 3.9a through 3.11b and depicted by the blue series lines in Figure 3.17 (amenable cyanide) and Figure 3.18 (total cyanide). Given the low number of detected concentrations, limited interpretation can be made on potential relationships between cyanide detects and river elevation from this dataset alone, as most of the data are at one detection limit with varying river elevations.

3.5.2 Sources of Cyanide

This section evaluates whether cyanide concentrations in surface water may be associated with either contaminated sediment resuspension or TZW discharge. One way to evaluate the potential influence of sediment resuspension is to review the TSS data relative to cyanide detects in filtered/unfiltered water.

No obvious pattern emerged from comparing unfiltered versus filtered cyanide results. In general, TSS measured as part of the surface water sampling was fairly low, as discussed above, and no consistent correlation between TSS concentration and cyanide concentration was observed (Figure 3.19 depicts the near bottom results). This is not surprising given the lack of a pattern between unfiltered and filtered analyses. If TSS is low, the difference between the two fractions should not be that great. A scatter plot and associated linear regression of TSS and the unfiltered portion of total cyanide (Figure 3.20) shows that the majority of the variation observed in concentrations of cyanide is not statistically explained by changing TSS, although the significance of such an evaluation is small, considering the low and non-detect levels of both TSS and cyanide. Consequently, it is unclear whether there is any predominant relationship in the limited cyanide detections at the Site to either sediment resuspension or TZW discharge, although both may contribute to the infrequently detected cyanide concentrations.

3.6 Summary of Cyanide Risks to Aquatic Life

The main objective of this study was to directly measure free cyanide concentrations (most relevant to evaluating potential risk) in the surface water and understand whether that cyanide may be sourced from groundwater discharges. As noted in the beginning of this section, the LWG will also find this information useful for evaluation of in-river risks from surface water and TZW. A preliminary evaluation of such risks is presented below, consistent with this Portland Harbor objective.

3.6.1 Aquatic Life Risks

No free cyanide was detected in any surface water sample, indicating no risk of cyanide toxicity to surface water aquatic life (e.g., fish) from groundwater discharge, or for that matter, sediment resuspension. Although some non-detect results were above the

AWQC level of 5.2 μg/L, the general absence of free cyanide in numerous other samples that were non-detect at 5 μg/L indicates a consistent absence of free cyanide below the lowest potentially applicable SLV.

As noted in Section 1, there was one detect of free cyanide (unfiltered) in shallow TZW (1.5 to 2.5 feet below mudline), but all other shallow TZW samples were non-detect for free cyanide. The concentration of free cyanide in the one shallow TZW sample with a detect (23 μg/L) is above the AWQC ecological SLV for surface water of 5.2 μg/L.

However, this AWQC is based on toxicity to fish in surface water and is not directly applicable to TZW. This value for free cyanide as listed in the JSCS is the freshwater criterion continuous concentration (CCC) for the protection of aquatic life (EPA 1985). An AWQC is derived using results from available toxicity tests reviewed at the time of the AWQC development for data adequacy. The EPA protocol for establishing AWQC (Stephan et al., 1985) requires data from several different aquatic families to capture the potential range of sensitivities in the aquatic environment as a whole. These requirements include at least two families of fish; crustaceans; insects and plants. Toxicity results of all are used in some part to develop the acute and chronic AWQC. However, in the case of cyanide and most other chemicals for which AWQC are derived, the CMC and CCC are driven by sensitivity of fish (specifically rainbow trout).

Consequently, TZW data are more appropriately compared to toxicity data relevant to benthic invertebrates that would be directly exposed to that TZW. As documented in EPA (1985), invertebrates proved to be more tolerant of cyanide when toxicity results were compared to those of fish. In fact, all of the results measuring the acute lethal concentration of 50 percent of the test organisms (LC_{50}) above 400 μg/L free cyanide were from invertebrate tests. A review of the available literature provided by EPA (1985), and additional data provided in EPA's ECOTOX database supports that benthic invertebrates are more tolerant to free cyanide than organisms living in the water column. EPA (1985) reported genus mean acute values (GMAVs) between approximately 167 and 2,490 μg/L while GMAVs of fishes were all below 150 μg/L. The average of acute benthic invertebrate toxicity values summarized in the ECOTOX database ranged from approximately 610 to over 100,000 μg/L.

There is less chronic toxicity invertebrate data than acute invertebrate toxicity data. Based on the review of the AWQC document (EPA 1985), chronic values for invertebrates range from 18 to 37 μg/L. (By comparison, the chronic value for brook trout was reported as 7.8 μg/L [EPA 1985].) An average chronic value for invertebrates of approximately 37 μg/L was estimated based on summary of the ECOTOX database.

Benthic invertebrates would be exposed to undiluted TZW. Thus, even the one shallow TZW detection of free cyanide at 23 μg/L does not indicate a substantial risk to river aquatic life. These findings support that there are no unacceptable risks from Site cyanide to river aquatic life either from ongoing groundwater transport or historical direct deposition of cyanide containing materials to sediments. In addition, the low levels of free cyanide in TZW and groundwater at the Site relative to total cyanide supports the hypothesis that total cyanides in Site groundwater are predominantly complexed (e.g., with iron) and that they are not being measurably converted to free cyanide in river water due to photolysis or other geochemical changes.

3.6.2 Human Health Risks

As presented in a previous submittal to DEQ (Anchor 2007b) total cyanide in its various complexed forms is generally not toxic to aquatic life or people. The JSCS value of 140 μg/L total cyanide (and the Portland Harbor-specific adaptation of this value to 14 μg/L) is based on an EPA free cyanide-based AWQC derived for the protection of human health from the consumption of fish.

The 140 μg/L value was derived by estimating a safe level of free cyanide in surface water based on an acceptable level of risk using standard consumption exposure factors (17.5 grams fish/day), an oral RfD for free cyanide, and an assumed bioaccumulation factor of free cyanide in surface water into fish tissue. The bioaccumulation factor assumed in deriving the AWQC is a default value of 1, and is not based on any measurements of bioaccumulation in any organisms. In fact, it is commonly reported in the literature (e.g., Dzombak 2006) that there is little to no potential for bioaccumulation of cyanide into animals (including fish). Consequently, it appears unsupported to apply

this AWQC for protecting people consuming fish given that cyanide is a non-bioaccumulative chemical derived using a default bioaccumulation factor.

Total cyanide was infrequently detected in surface water and always at concentrations at or below the EPA's free cyanide human health AWQC of 140 μg/L. Further, most of these total cyanide detections in surface water were at or close to the JSCS's even more conservative adaptation of EPA's free cyanide AWQC (i.e., 14 μg/L). The surface water data therefore indicate no unacceptable risk to human health via fish consumption due to Site cyanide.

In addition, all surface water and shallow TZW total cyanide data (including unfiltered data) are below drinking water maximum contaminant levels (MCLs; 200 μg/L) and Region 6 preliminary remedial goals (PRGs; 730 μg/L). Thus, no risks to human health from the consumption of river water or TZW are present, even if such exposures existed.

4 SEEPAGE STUDY

4.1 Introduction

Following submittal of the Work Plan (Anchor 2007a), NW Natural determined that conducting groundwater discharge monitoring using seepage meters would provide additional lines of evidence for verifying groundwater discharge and providing general level estimates of groundwater discharge rates within the river sediments adjacent to the Site. The planned deployment of seepage meters was subsequently described to DEQ in the *Proposed Groundwater Seepage Meter Deployment Scope of Work – Gasco Site* (Anchor 2007c).

Seepage meters were previously deployed adjacent to the Site and the Siltronic property by the LWG in 2005. Due to construction activities associated with the 2005 NW Natural tar body removal action, seepage meters could not be deployed by LWG within the zone shown in Figure 4.1. To build upon the LWG dataset and provide groundwater discharge data co-located with the Phase 2 offshore Step 1 and Step 2 groundwater sampling stations, NW Natural conducted similar seepage meter monitoring offshore of the Site, as approved by DEQ. Concurrent with the seepage meter monitoring, NW Natural conducted a TZW tidal study, which is described in Section 2.

4.2 Sampling Methods

NW Natural deployed the identical type of seepage meter used by LWG during the Round 2 sampling for the Portland Harbor Superfund Site RI. A detailed description of these meters is provided in the *Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Sampling and Analysis Plan – Attachment 1 Field Sampling Plan Groundwater Plume Discharge Mapping* (Integral 2005). The meters are ultrasonic seepage meters that are owned and deployed by Coastal Monitoring Associates (CMA) located in San Diego, California.

Ultrasonic seepage meters conduct time-series flow rate measurements, which capture both positive and negative discharge at the water-sediment interface. This time-series information is particularly important in a tidally influenced environment such as the Willamette River adjacent to the Site. These meters utilize an ultrasonic flow meter that relies on transit time difference between ultrasonic pulses traveling in the upstream and downstream directions. The flow meter is connected to an inverted funnel that seals into the mudline and serves to amplify the seepage rate as it moves through the flow meter.

Prior to the field study, the seepage meters were calibrated over the expected flow range using a high resolution peristaltic pump. A total of seven seepage meters were installed in the locations shown on Figure 1.3. Six of these units were "remote" systems, for which the data logger and battery are housed on the same frame as the flow meter and seepage funnel. The entire remote unit can be deployed to the river bottom without a buoy connection. The seventh unit was a "buoy" system, meaning that the data logger and the battery are housed in a buoy at the water surface, and connected to the flow meter and seepage funnel via a telemetry cable. The single buoy system supports two funnel/flow meter units.

Remote systems were deployed at monitoring stations GS-B2, GS-B5, GS-B7, GS-C5, GS-C7, and GS-D5. The buoy system (with two funnel/flow meters) was installed within the tar body removal action pilot cap area at station GS-PC1 (Figure 1.3). All installations and retrievals were made by CMA divers operating from a vessel. For all stations except GS-PC1, data were recorded at a rate of 1 flow rate per minute and subsequently averaged to 15 minute intervals. At station GS-PC1, one of the flow meter units recorded data at the 1 flow rate per minute, and the other meter unit recorded only at a 1 flow rate per 15 minutes due to memory limitations. The maximum battery power for both the remote and buoy type meters is approximately 3 days, and sampling was conducted for this full duration at each station from October 2 to 6, 2007. This sampling timeframe was planned to be seasonally consistent with the 2005 LWG sampling period (i.e., August 1 to September 9, 2005) during low river elevations.

CMA indicated that the accuracy of the seepage measurements is anticipated to be $\pm$0.5 cm/d given the encountered Site conditions. Although the LWG used an accuracy of $\pm$1 cm/d for interpretation of the Portland Harbor Round 2 seepage data (Integral 2006), the current study relies on the CMA determined accuracy of +0.5 cm/d.

To assist in the evaluation of the collected seepage meter data, hourly rainfall data from the rainfall gage at 3395 NW Yeon Avenue was obtained, along with river elevation data from the Site transducer (reported at 15-minute intervals). The rainfall and river elevation data were used to determine if variations in regional rainfall conditions and/or river elevation fluctuations (i.e., tidal variations) affected observed seepage rates. In addition, the CMA

divers noted the sediment texture at each of the seepage monitoring stations to facilitate an evaluation of potential sediment type effects on observed groundwater discharge rates.

4.3 Results

Seepage data was successfully collected at six out of seven target stations. For the seepage meter at station GS-B5, no results were obtained, as the data logger was inadvertently not activated by the diver during installation of the meter. By the time the issue was identified, it was not feasible to redeploy the meter due to the limited amount of time remaining in the survey window. At station GS-PC1 (within the tar body removal action pilot cap area), the primary meter (1 flow rate per minute) became air-locked after approximately 4 hours and therefore no viable data were recorded beyond that time. However, the secondary meter (1 flow rater per 15 minutes) successfully collected data throughout the deployment duration. Flow meters can occasionally air-lock due to gas release from the sediment, in spite of the gas trap installed on each funnel. This also occurred at monitoring station GSCT-B during the LWG seepage investigation (Integral 2006).

The collected seepage meter datasets were trimmed on the front end by CMA to allow for equilibration of the flow meter and on the back end to ensure that removal of the meter did not affect the measurements. A summary of the data collection period, geographical coordinates, water depth, and sediment type at each monitoring station are summarized in Table 4.1, including the seepage meters deployed by the LWG. A more detailed summary of all of the field collection information for each monitoring station is provided in Appendix O. CMA's technical memorandum summarizing the Site seepage meter investigation and results is provided in Appendix P.

The observed groundwater seepage results summary statistics for both the Site and LWG seepage meters are presented in Table 4.2. The data were recorded at a frequency of 1 flow rate per minute (except at station GS-PC1B, which was recorded at 15-minute intervals) and subsequently averaged to 15 minute intervals to maintain consistency with the LWG seepage meter dataset. The statistics presented in Table 4.2 are based on the averaged data. The 1 flow rate per minute data were reviewed for stations GS-B2, GS-B5, GS-C5, GS-C7, and GS-D7 to evaluate the variation in seepage rates for each consecutive minute measurement. This evaluation showed that less than 10 percent of the consecutive 1 minute

measurements exceeded 0.5 cm/d at stations GS-B2, GS-B5, GS-C5, and GS-C7. Alternatively, 20 percent of the consecutive minute measurements at station GS-D5 exceeded 0.5 cm/d and only 3 percent exceeded 1 cm/d. This evaluation indicates a measurement tolerance of 0.5 cm/d is generally appropriate and that seepage is relatively consistent over 1-minute time scales.

With the exception of GS-B7, the mean groundwater flow rate at all stations was positive (showing discharge) with a minimum of -0.05 cm/day at GS-B7 to a high of 1.47 cm/day at GS-D5 (Table 4.2). The mean groundwater discharge rate in the pilot cap at GS-PC1B was comparable to rates observed along the offshore transects (1.03 cm/day). Table 4.2 also lists the seepage data obtained at the LWG seepage meter stations deployed at both the Gasco and Siltronic sites in 2005. The observed groundwater seepage results summary statistics observed during the LWG seepage meter investigation (Integral 2006) adjacent to the Site are provided as a point of comparison in Figure 4.2. Section 4.4 provides a detailed discussion of the LWG seepage data relative to the Site seepage data.

A detailed evaluation of the observed groundwater discharge at each of the monitoring stations and the potential relation to natural variables is described in the following sections. The standard deviation error bars shown in each of the time series groundwater discharge plots is 0.5 cm/d, which is consistent with the specified equipment tolerance identified by CMA and the observed variation in seepage rates at each of the monitoring stations (discussed above). River elevations are provided in COP datum and are reported at 15-minute intervals. Rainfall is reported at hourly intervals in inches of rain.

4.3.1 Station GS-B2

The CMA divers observed that the mudline sediment type at monitoring station GS-B2 was a silty clay. Except for the sediment type encountered at station GS-B7, also a silty clay, the substrate at GS-B2 was stiffer relative to the other stations. Additional evidence for the relative stiffness at this station was provided during the attempted co-located TZW sampling. The diver indicated difficulty in installing the supporting rods necessary to support the piezometer assembly. Further, no TZW samples could be collected at this station due to the low permeability of the sediments.

The time series plot of groundwater discharge relative to river elevation is presented in Figure 4.3. The measured seepage rates, combined with the low permeability sediment identified at this station, indicate that this area had a very low net groundwater discharge of 0.05 cm/day during the monitoring period.

Review of the LWG seepage meter investigation indicates that the closest monitoring station (i.e., GCSEEP-2A) was located much farther in-shore at the base of the shoreline slope (Figures 4.2 and 1.3) and in a different type of sediments. Thus, this station is not comparable to GS-B2. The time series plot of groundwater discharge relative to river elevation at LWG station GCSEEP-2A is presented in Figure 4.4. Groundwater discharge and recharge was observed, and the temporal variations show a general trend of groundwater discharge during lower river elevations and recharge during higher river elevations.

4.3.2 Station GS-B7

As noted above, the sediment type encountered at station GS-B7 was also a silty clay, a stiffer substrate relative to the C and D transect stations. Similar to station GS-B2, the relative stiffness at this station was further documented during the co-located TZW sampling. The diver indicated difficulty in installing the supporting rods necessary to support the piezometer assembly. Due to the low permeability of the sediment at this station, only a small volume of TZW sample could be collected at this station (leading to a limited suite of analytical parameters).

The time series plot of groundwater discharge relative to river elevation is presented in Figure 4.5. The measured seepage rates, combined with the low permeability sediment identified at this station, indicate that this area had a negative mean seepage rate of -0.5 cm/d during the monitoring period. Thus, this area showed no net groundwater discharge during the monitoring period.

Review of the LWG seepage meter investigation indicates that the closest monitoring station (i.e., GCSEEP-7B) was located farther in-shore near the base of the shoreline slope (Figures 4.2 and 1.3). This station exhibited sandy sediments and a much higher mean and maximum groundwater discharge of 5.7 and 8.7 cm/d, respectively, relative to

station GS-B7 (Table 4.22). Because of the differences in location along the shoreline slope and substrate types, these stations would not be expected to show comparable seepage rates. The time series plot of groundwater discharge at LWG station GCSEEP-7B relative to river elevation is presented in Figure 4.6. Groundwater discharge was observed throughout the data collection, and the temporal variations did not correlate with the changes in the river elevations.

4.3.3 Station GS-C5

The sediment type encountered at station GS-C5 was a silty sand. A co-located TZW sample was not collected at this station. The time series plot of groundwater discharge relative to river elevation is presented in Figure 4.7. In contrast to the GS-B2 and -B7 stations, measurable discharge (i.e., greater than 0.5 cm/d) was identified at numerous times during the data collection period, with a mean discharge of approximately 0.69 cm/d. More apparent cycling of measurable discharge rates occurs approximately half way through the deployment period. During this period, the wavelength of the groundwater discharge cycles (i.e., from crest to crest) was approximately half the wavelength exhibited by the river elevation/tidal variations, indicating tidal variations are not governing the observed groundwater discharge variations. Figure 4.8 depicts groundwater discharge versus rainfall measured at the Yeon Avenue rainfall gage and shows that rainfall near the Site does not appear to be correlated to the measurable discharge variability at station GS-C5.

Review of the LWG seepage meter investigation showed no seepage monitoring stations in the vicinity of station GS-C5, precluding comparison between the two investigations.

4.3.4 Station GS-C7

The sediment type encountered at station GS-C7 was a sandy silt. A co-located TZW sample was collected at this station. The diver that installed the piezometer assembly also observed sandy silt sediment at this station and indicated no difficulty in installing the piezometer supporting rods. TZW samples were also collected at this station with very little resistance to pumping. The time series plot of groundwater discharge relative to river elevation is presented in Figure 4.9. Similar to station GS-C5, measurable discharge (i.e., greater than 0.5 cm/d) was identified at numerous times during the data

collection period with a mean discharge of 1.38 cm/d. There are no apparent trends in the variations in measurable discharge rates throughout the deployment period. There is also no observable correlation with river elevations, indicating tidal effects are not governing the observed groundwater discharge fluctuations. Figure 4.10 depicts groundwater discharge versus rainfall measured at the Yeon Avenue rainfall gage and shows a possible correlation of seepage rate with rainfall during the period from 18:45 on October 3 to 1:00 on October 4.

Review of the LWG seepage meter investigation indicates that monitoring station GCSEEP-7F was in the same general vicinity as GS-C7 (Figures 4.2 and 1.3). This station exhibited silty sediments and a mean and maximum groundwater discharge of 0.3 and 3.1 cm/d, respectively. The differences in substrate type between GS-C7 and GCSEEP-7F likely explain the variation in mean seepage rates at these two stations. The time series plot of groundwater discharge relative to river elevation for LWG station GCSEEP-7F is presented in Figure 4.11. Groundwater discharge and recharge was observed, and the temporal variations show a general trend of groundwater discharge during lower river elevations and recharge during higher river elevations.

4.3.5 Station GS-D5

The sediment type encountered at station GS-D5 was a sandy silt. Similar to station GS-C7, a co-located TZW sample was collected at this station and the diver confirmed a sandy silt sediment. TZW samples were collected at this station with very little resistance to pumping. The time series plot of groundwater discharge relative to river elevation is presented in Figure 4.12. Measurable discharge (i.e., greater than 0.5 cm/d) was identified at numerous times during the data collection period with a mean discharge at approximately 1.47 cm/d. There is no apparent trend in the variation in measurable discharge rates throughout the deployment period. There is no consistent correlation with river elevations, indicating that tidal variations are not governing the observed groundwater discharge variations. Groundwater discharge versus rainfall is shown in Figure 4.13. Rainfall near the Site does not appear to be directly correlated to the measurable discharge variability at station GS-D5; however, rainfall may have increased the magnitude of the river elevation peaks.

4.3.6 Station GS-PC1

Station GS-PC1 is located within the Gasco tar body removal action pilot cap area. The pilot cap consists of an approximately 12-inch sand cap covered with an approximately 6-inch armor layer. Monitoring of the pilot cap's ability to isolate underlying sediments and residual contamination left in place following the removal action has been ongoing since March 2006 with the most recent monitoring event in November 2007. This monitoring includes the collection of TZW from within the sand cap layer. This layer has consistently showed elevated chemical concentrations indicating the cap area is a net groundwater discharge area. The groundwater discharge data collected at station GS-PC1 helped facilitate quantification of this discharge.

The sediment type encountered was a silt. This is consistent with the long-term monitoring findings of a 4 to 6-inch layer of depositional silt covering the pilot cap area (underlain by the pilot cap armor layer). No co-located TZW sample was collected at this station as part of the tidal study. The time series plot of groundwater discharge relative to river elevation is presented in Figure 4.14. Measurable discharge (i.e., greater than 0.5 cm/d) and recharge (less than -0.5 cm/d) was identified at numerous times during the data collection period with a mean discharge of 1.03 cm/d. The observed flow variations were dissimilar to the other monitoring stations showing a distinct peak in discharge bounded by long periods of low or recharge. The duration of no discharge and recharge were generally similar (14 to 15 hours). The data does not show a correlation with the river elevations. It is not clear how other factors such as the nature of the dredge area cutting into the bank and/or the underlying pilot cap/armor layers may affect the discharge patterns at this station. As shown in Figure 4.15, it not apparent that rainfall affected groundwater discharge at station GS-PC1.

4.4 Calculation of Total Seepage Rate

Seepage data from the 2005 LWG investigations at Gasco and Siltronic were combined with seepage data from the 2007 Gasco seepage investigation to estimate the total seepage from the area offshore of Gasco and offshore of the northern portion of Siltronic. Figure 4.16 shows the area offshore of the Gasco and Siltronic facilities divided into three transects. Transect A is adjacent to the shoreline and the outer boundary of transect C is about 624 feet

from shore. Each transect is divided into 10 rectangular sectors. Each sector is approximately 220 by 208 feet.

Table 4.2 lists the groundwater discharge rate data for the NW Natural seepage meters deployed in 2007 and the LWG seepage meters deployed at the Gasco and Siltronic Sites in 2005. Table 4.3 lists the seepage meters located in each of the sectors shown on Figure 4.16.

The third column on Table 4.3 lists the mean specific discharge measured by the seepage meters deployed by LWG and NW Natural. Table 4.3 and Figure 4.16 show that five of the transect B sectors and nine of the transect C sectors did not have seepage meters deployed. For this evaluation, both linear and exponential kriging were used to interpolate seepage rates into the sectors that do not have seepage meter data. The fourth and fifth columns on Table 4.3 show the mean specific discharge derived from linear and exponential kriging for all sectors. Columns six and seven show the average discharge for each sector in gallons per minute (GPM) calculated from linear and exponential kriging. The total flow from all 30 sectors ranged from 225 GPM using linear kriging to 253 GPM using exponential kriging.

The estimated range from 225 to 253 GPM of total seepage is believed to be representative of river conditions that existed at the time of seepage meter assessment, that is, low river elevation that is typical for late summer and early fall seasons. It is expected that these conditions produce a higher seepage rate than winter and spring conditions, when the average river elevation increases significantly. Therefore, it is likely that the 253 GPM seepage rate determined in this study is near the maximum seepage that is expected to occur on a seasonal basis.

The length of shoreline divided into offshore sectors approximately coincides with the length of shoreline proposed for groundwater source control in Segments 1 and 2, as described in the *Gasco/Siltronic Groundwater and NAPL Source Control Focused Feasibility Study* (Anchor 2007f) (FFS). The FFS proposes to use upland groundwater extraction wells to contain groundwater and prevent it from discharging into the river. A ModFlow groundwater model was used in the FFS to determine that a total of approximately 200 GPM must be pumped from the shoreline extraction wells to achieve source control. The maximum estimated seepage rate calculated for the river offshore of the extraction wells is

253 GPM, approximately 27 percent higher than the ModFlow model predicted extraction well total yield.

Given the variables and assumptions made in the seepage study and in the ModFlow groundwater model, these two groundwater flow estimates are considered to be reasonable and comparable. Therefore the 225 to 253 GPM estimated range of total seepage is considered to be an independent line of evidence that the ModFlow extraction well flow rate of 200 GPM is reasonably accurate. In order to be conservative, the predicted flow rate for the upland extraction wells may be increased to reflect the findings of the seepage study. The ModFlow model and model results will be further evaluated during design of the upland groundwater extraction well and treatment system.

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TABLES

Table 1.1
Coordinates of Phase 2 Sampling Locations

Location ID	Handheld GPS		Date	Time	Transducer River Elevation	Deck to Mudline	DTW Below Deck	Depth of Water	Mudline Elevation	Screen Interval	Screen Elevation
	Northing	Easting								BML	
GS-B1-A	45.58146	-122.76132	7/17/2007	8:40	9.89	38.1	2.3	35.8	-25.9	0.9 - 1.9	-26.8 - -27.8
GS-B1-B	45.58146	-122.76132	7/17/2007	8:40	9.89	38.1	2.3	35.8	-25.9	4.9 - 6.9	-30.8 - -32.8
GS-B1-C	45.58146	-122.76132	7/17/2007	8:40	9.89	38.1	2.3	35.8	-25.9	12.9 - 14.9	-38.8 - -40.8
GS-B2-A1	45.58108	-122.76048	7/17/2007	14:00	8.43	40.5	2.3	38.2	-29.8	1.5 - 2.5	-31.3 - -32.3
GS-B2-A2	45.58108	-122.76048	7/17/2007	14:00	8.43	40.5	2.3	38.2	-29.8	4.5 - 5.5	-34.3 - -35.3
GS-B2-B	45.58108	-122.76048	7/17/2007	14:00	8.43	40.5	2.3	38.2	-29.8	8.5 - 10.5	-38.3 - -40.3
GS-B2-C	45.58108	-122.76048	7/17/2007	14:00	8.43	40.5	2.3	38.2	-29.8	16.5 - 18.5	-46.3 - -48.3
GS-B2-W-25	45.58104	-122.76049	9/12/2007	8:20	6.925	25.0	2.4	22.6	-15.7	23 - 27	-38.7 - -42.7
GS-B2-W-50	45.58104	-122.76049	9/12/2007	8:20	6.925	25.0	2.4	22.6	-15.7	48 - 52	-63.7 - -67.7
GS-B2-W-75	45.58104	-122.76049	9/12/2007	8:20	6.925	25.0	2.4	22.6	-15.7	73 - 77	-88.7 - -92.7
GS-B2-W-100	45.58104	-122.76049	9/12/2007	8:20	6.925	25.0	2.4	22.6	-15.7	98 - 102	-113.7 - -117.7
GS-B2-W-125	45.58104	-122.76049	9/12/2007	8:20	6.925	25.0	2.4	22.6	-15.7	123 - 127	-138.7 - -142.7
GS-B2-W-144	45.58104	-122.76049	9/12/2007	8:20	6.925	25.0	2.4	22.6	-15.7	140 - 144	-155.7 - -159.7
GS-B3-A	45.58072	-122.75956	7/19/2007	12:45	7.505	44.0	2.3	41.7	-34.2	1 - 2	-35.2 - -36.2
GS-B3-B	45.58072	-122.75956	7/19/2007	12:45	7.505	44.0	2.3	41.7	-34.2	5 - 7	-39.2 - -41.2
GS-B3-C	45.58072	-122.75956	7/19/2007	12:45	7.505	44.0	2.3	41.7	-34.2	13 - 15	-47.2 - -49.2
GS-B4-A	45.58034	-122.75851	7/19/2007	8:30	8.035	42.0	2.3	39.7	-31.7	1 - 2	-32.7 - -33.7
GS-B4-B	45.58034	-122.75851	7/19/2007	8:30	8.035	42.0	2.3	39.7	-31.7	5 - 7	-36.7 - -38.7
GS-B4-C	45.58034	-122.75851	7/19/2007	8:30	8.035	42.0	2.3	39.7	-31.7	13 - 15	-44.7 - -46.7
GS-B5-A	45.57996	-122.75750	7/18/2007	9:45	8.851	39.4	2.3	37.1	-28.2	1.6 - 2.6	-29.8 - -30.8
GS-B5-B	45.57996	-122.75750	7/18/2007	9:45	8.851	39.4	2.3	37.1	-28.2	5.6 - 7.6	-33.8 - -35.8
GS-B5-C	45.57996	-122.75750	7/18/2007	9:45	8.851	39.4	2.3	37.1	-28.2	13.6 - 15.6	-41.8 - -43.8
GS-B5-W-25	45.57995	-122.75750	9/14/2007	8:15	7.029	29.5	2.4	27.1	-20.1	23 - 27	-43.1 - -47.1
GS-B5-W-50	45.57995	-122.75750	9/14/2007	8:15	7.029	29.5	2.4	27.1	-20.1	48 - 52	-68.1 - -72.1
GS-B5-W-60	45.57995	-122.75750	9/14/2007	8:15	7.029	29.5	2.4	27.1	-20.1	48 - 52	-68.1 - -72.1
GS-B5-W-75	45.57995	-122.75750	9/14/2007	8:15	7.029	29.5	2.4	27.1	-20.1	73 - 77	-93.1 - -97.1
GS-B5-W-98.5	45.57995	-122.75750	9/14/2007	8:15	7.029	29.5	2.4	27.1	-20.1	94.5 - 98.5	-114.6 - -118.6
GS-B6-A	45.57965	-122.75656	7/6/2007	9:30	7.574	41.8	2.3	39.5	-31.9	1 - 2	-32.9 - -33.9
GS-B6-B	45.57965	-122.75656	7/6/2007	9:30	7.574	41.8	2.3	39.5	-31.9	5 - 7	-36.9 - -38.9
GS-B6-C	45.57965	-122.75656	7/6/2007	9:30	7.574	41.8	2.3	39.5	-31.9	13 - 15	-44.9 - -46.9
GS-B7-A	45.57942	-122.75603	7/5/2007	10:38	7.627	40.0	2.3	37.7	-30.1	1 - 2	-31.1 - -32.1
GS-B7-B	45.57942	-122.75603	7/5/2007	10:38	7.627	40.0	2.3	37.7	-30.1	5 - 7	-35.1 - -37.1
GS-B7-C	45.57942	-122.75603	7/5/2007	10:38	7.627	40.0	2.3	37.7	-30.1	13 - 15	-43.1 - -45.1
GS-B7-W-25	45.57942	-122.75604	8/28/2007	9:30	6.493	37.8	2.4	35.4	-28.9	23 - 27	-51.9 - -55.9
GS-B7-W-50	45.57942	-122.75604	8/28/2007	9:30	6.493	37.8	2.4	35.4	-28.9	48 - 52	-76.9 - -80.9
GS-B7-W-75	45.57942	-122.75604	8/28/2007	9:30	6.493	37.8	2.4	35.4	-28.9	73 - 77	-101.9 - -105.9
GS-B7-W-100	45.57942	-122.75604	8/28/2007	9:30	6.493	37.8	2.4	35.4	-28.9	98 - 102	-126.9 - -130.9
GS-B7-W-125	45.57942	-122.75604	8/28/2007	9:30	6.493	37.8	2.4	35.4	-28.9	123 - 127	-151.9 - -155.9

Table 1.1
Coordinates of Phase 2 Sampling Locations

Location ID	Handheld GPS Northing	Handheld GPS Easting	Date	Time	Transducer River Elevation	Deck to Mudline	DTW Below Deck	Depth of Water	Mudline Elevation	Screen Interval BML	Screen Elevation
GS-B8-A	45.57899	-122.75497	7/9/2007	7:50	6.618	38.0	2.3	35.7	-29.1	1 - 2	-30.1 - -31.1
GS-B8-B	45.57899	-122.75497	7/9/2007	7:50	6.618	38.0	2.3	35.7	-29.1	5 - 7	-34.1 - -36.1
GS-B8-C	45.57899	-122.75497	7/9/2007	7:50	6.618	38.0	2.3	35.7	-29.1	13 - 15	-42.1 - -44.1
GS-B9-A	45.57862	-122.75391	7/9/2007	11:50	6.059	38.0	2.3	35.7	-29.6	1.5 - 2.5	-31.1 - -32.1
GS-B9-B	45.57862	-122.75391	7/9/2007	11:50	6.059	38.0	2.3	35.7	-29.6	5 - 7	-34.6 - -36.6
GS-B9-C	45.57862	-122.75391	7/9/2007	11:50	6.059	38.0	2.3	35.7	-29.6	14.9 - 16.9	-44.5 - -46.5
GS-C1-A	45.58181	-122.76079	7/16/2007	14:00	8.344	59.3	2.3	57.0	-48.7	1.7 - 2.7	-50.4 - -51.4
GS-C1-B	45.58181	-122.76079	7/16/2007	14:00	8.344	59.3	2.3	57.0	-48.7	5.7 - 7.7	-54.4 - -56.4
GS-C1-C	45.58181	-122.76079	7/16/2007	14:00	8.344	59.3	2.3	57.0	-48.7	13.7 - 15.7	-62.4 - -64.4
GS-C2-A	45.58151	-122.76001	7/16/2007	10:20	9.307	52.6	2.3	50.3	-41.0	2.4 - 3.4	-43.4 - -44.4
GS-C2-B	45.58151	-122.76001	7/16/2007	10:20	9.307	52.6	2.3	50.3	-41.0	5.4 - 7.4	-46.4 - -48.4
GS-C2-C	45.58151	-122.76001	7/16/2007	10:20	9.307	52.6	2.3	50.3	-41.0	13.4 - 15.4	-54.4 - -56.4
GS-C2-W-25	45.58151	-122.76003	9/13/2007	8:00	7.425	51.0	2.4	48.6	-41.2	23 - 27	-64.2 - -68.2
GS-C2-W-50	45.58151	-122.76003	9/13/2007	8:00	7.425	51.0	2.4	48.6	-41.2	48 - 52	-89.2 - -93.2
GS-C2-W-75	45.58151	-122.76003	9/13/2007	8:00	7.425	51.0	2.4	48.6	-41.2	73 - 77	-114.2 - -118.2
GS-C2-W-100	45.58151	-122.76003	9/13/2007	8:00	7.425	51.0	2.4	48.6	-41.2	98 - 102	-139.2 - -143.2
GS-C2-W-119	45.58151	-122.76003	9/13/2007	8:00	7.425	51.0	2.4	48.6	-41.2	115 - 119	-156.2 - -160.2
GS-C3-A	45.58131	-122.75911	7/13/2007	14:20	7.426	53.7	2.3	51.4	-44.0	1 - 2	-45.0 - -46.0
GS-C3-B	45.58131	-122.75911	7/13/2007	14:20	7.426	53.7	2.3	51.4	-44.0	5 - 7	-49.0 - -51.0
GS-C3-C	45.58131	-122.75911	7/13/2007	14:20	7.426	53.7	2.3	51.4	-44.0	13 - 15	-57.0 - -59.0
GS-C4-A	45.58087	-122.75806	7/13/2007	9:10	8.837	54.6	2.3	52.3	-43.5	1 - 2	-44.5 - -45.5
GS-C4-B	45.58087	-122.75806	7/13/2007	9:10	8.837	54.6	2.3	52.3	-43.5	5 - 7	-48.5 - -50.5
GS-C4-C	45.58087	-122.75806	7/13/2007	9:10	8.837	54.6	2.3	52.3	-43.5	13 - 15	-56.5 - -58.5
GS-C5-A	45.58042	-122.75695	7/12/2007	12:15	7.162	53.0	2.3	50.7	-43.5	1 - 2	-44.5 - -45.5
GS-C5-B	45.58042	-122.75695	7/12/2007	12:15	7.162	53.0	2.3	50.7	-43.5	5 - 7	-48.5 - -50.5
GS-C5-C	45.58042	-122.75695	7/12/2007	12:15	7.162	53.0	2.3	50.7	-43.5	13 - 15	-56.5 - -58.5
GS-C5-W-25	45.58038	-122.75697	9/11/2007	8:30	6.104	50.0	2.4	47.6	-41.5	23 - 27	-64.5 - -68.5
GS-C5-W-50	45.58038	-122.75697	9/11/2007	8:30	6.104	50.0	2.4	47.6	-41.5	48 - 52	-89.5 - -93.5
GS-C5-W-75	45.58038	-122.75697	9/11/2007	8:30	6.104	50.0	2.4	47.6	-41.5	73 - 77	-114.5 - -118.5
GS-C5-W-94	45.58038	-122.75697	9/11/2007	8:30	6.104	50.0	2.4	47.6	-41.5	90 - 94	-131.5 - -135.5
GS-C6-A	45.58010	-122.75623	7/12/2007	8:30	8.398	53.7	2.3	51.4	-43.0	1.1 - 2.1	-44.1 - -45.1
GS-C6-B	45.58010	-122.75623	7/12/2007	8:30	8.398	53.7	2.3	51.4	-43.0	5.3 - 7.3	-48.3 - -50.3
GS-C6-C	45.58010	-122.75623	7/12/2007	8:30	8.398	53.7	2.3	51.4	-43.0	13.3 - 15.3	-56.3 - -58.3
GS-C7-A	45.57977	-122.75574	7/11/2007	12:30	6.38	52.9	2.3	50.6	-44.2	1 - 2	-45.2 - -46.2
GS-C7-B	45.57977	-122.75574	7/11/2007	12:30	6.38	52.9	2.3	50.6	-44.2	5 - 7	-49.2 - -51.2
GS-C7-C	45.57977	-122.75574	7/11/2007	12:30	6.38	52.9	2.3	50.6	-44.2	13 - 15	-57.2 - -59.2
GS-C7-W-25	45.57980	-122.75580	8/31/2007	11:00	7.39	48.0	2.4	45.6	-38.2	23 - 27	-61.2 - -65.2
GS-C7-W-50	45.57980	-122.75580	8/31/2007	11:00	7.39	48.0	2.4	45.6	-38.2	48 - 52	-86.2 - -90.2

Table 1.1
Coordinates of Phase 2 Sampling Locations

Location ID	Handheld GPS		Date	Time	Transducer River Elevation	Deck to Mudline	DTW Below Deck	Depth of Water	Mudline Elevation	Screen Interval	Screen Elevation
	Northing	Easting								BML	
GS-C7-W-75	45.57980	-122.75580	8/31/2007	11:00	7.39	48.0	2.4	45.6	-38.2	73 - 77	-111.2 - -115.2
GS-C7-W-100	45.57980	-122.75580	8/31/2007	11:00	7.39	48.0	2.4	45.6	-38.2	98 - 102	-136.2 - -140.2
GS-C8-A	45.57948	-122.75472	7/11/2007	8:30	7.638	52.8	2.3	50.5	-42.9	1.2 - 2.2	-44.1 - -45.1
GS-C8-B	45.57948	-122.75472	7/11/2007	8:30	7.638	52.8	2.3	50.5	-42.9	5.2 - 7.2	-48.1 - -50.1
GS-C8-C	45.57948	-122.75472	7/11/2007	8:30	7.638	52.8	2.3	50.5	-42.9	13.2 - 15.2	-56.1 - -58.1
GS-C9-A	45.57917	-122.75372	7/10/2007	11:00	6.658	49.6	2.5	47.1	-40.4	1 - 2	-41.4 - -42.4
GS-C9-B	45.57917	-122.75372	7/10/2007	11:00	6.658	49.6	2.5	47.1	-40.4	5 - 7	-45.4 - -47.4
GS-C9-C	45.57917	-122.75372	7/10/2007	11:00	6.658	49.6	2.5	47.1	-40.4	13 - 15	-53.4 - -55.4
GS-D1-A	45.58130	-122.75779	7/20/2007	8:35	7.283	52.0	2.3	49.7	-42.4	1 - 2	-43.4 - -44.4
GS-D1-B	45.58130	-122.75779	7/20/2007	8:35	7.283	52.0	2.3	49.7	-42.4	5 - 7	-47.4 - -49.4
GS-D1-C	45.58130	-122.75779	7/20/2007	8:35	7.283	52.0	2.3	49.7	-42.4	13 - 15	-55.4 - -57.4
GS-D2-A	45.58089	-122.75664	7/20/2007	11:50	7.475	55.0	2.3	52.7	-45.2	1 - 2	-46.2 - -47.2
GS-D2-B	45.58089	-122.75664	7/20/2007	11:50	7.475	55.0	2.3	52.7	-45.2	5 - 7	-50.2 - -52.2
GS-D2-C	45.58089	-122.75664	7/20/2007	11:50	7.475	55.0	2.3	52.7	-45.2	13 - 15	-58.2 - -60.2
GS-D2-W-25	45.58088	-122.75665	9/10/2007	8:42	5.364	54.0	2.4	51.6	-46.2	23 - 27	-69.2 - -73.2
GS-D2-W-50	45.58088	-122.75665	9/10/2007	8:42	5.364	54.0	2.4	51.6	-46.2	48 - 52	-94.2 - -98.2
GS-D2-W-75	45.58088	-122.75665	9/10/2007	8:42	5.364	54.0	2.4	51.6	-46.2	73 - 77	-119.2 - -123.2
GS-D2-W-100	45.58088	-122.75665	9/10/2007	8:42	5.364	54.0	2.4	51.6	-46.2	98 - 102	-144.2 - -148.2
GS-D3-A	45.58050	-122.75585	7/23/2007	8:05	6.734	56.5	2.3	54.2	-47.5	0.5 - 1.5	-48.0 - -49.0
GS-D3-B	45.58050	-122.75585	7/23/2007	8:05	6.734	56.5	2.3	54.2	-47.5	4.5 - 6.5	-52.0 - -54.0
GS-D3-C	45.58050	-122.75585	7/23/2007	8:05	6.734	56.5	2.3	54.2	-47.5	12.5 - 14.5	-60.0 - -62.0
GS-D4-A	45.58028	-122.75537	7/23/2007	12:25	6.745	57.0	2.3	54.7	-48.0	1 - 2	-49.0 - -50.0
GS-D4-B	45.58028	-122.75537	7/23/2007	12:25	6.745	57.0	2.3	54.7	-48.0	5 - 7	-53.0 - -55.0
GS-D4-C	45.58028	-122.75537	7/23/2007	12:25	6.745	57.0	2.3	54.7	-48.0	13 - 15	-61.0 - -63.0
GS-D4-W-25	45.58022	-122.75537	9/6/2007	8:27	4.537	54.0	2.4	51.6	-47.1	23 - 27	-70.1 - -74.1
GS-D4-W-35	45.58022	-122.75537	9/6/2007	8:27	4.537	54.0	2.4	51.6	-47.1	23 - 27	-70.1 - -74.1
GS-D4-W-50	45.58022	-122.75537	9/6/2007	8:27	4.537	54.0	2.4	51.6	-47.1	48 - 52	-95.1 - -99.1
GS-D4-W-63	45.58022	-122.75537	9/6/2007	8:27	4.537	54.0	2.4	51.6	-47.1	59 - 63	-106.1 - -110.1
GS-D5-A	45.58004	-122.75463	7/24/2007	8:20	6.737	54.5	2.3	52.2	-45.5	1 - 2	-46.5 - -47.5
GS-D5-B	45.58004	-122.75463	7/24/2007	8:20	6.737	54.5	2.3	52.2	-45.5	5 - 7	-50.5 - -52.5
GS-D5-C	45.58004	-122.75463	7/24/2007	8:20	6.737	54.5	2.3	52.2	-45.5	13 - 15	-58.5 - -60.5

Note:

DTW - depth to water

BML - below mudline

Elevation Datum = City of Portland

Table 1.2
Phase 2 Field Water Quality Parameters

Location ID	Date	pH	Conductivity (µS)	Temp (ºC)	ORP (mV)	Diss O2 (mg/l)	Turbidity (NTU)	Water Quality	NAPL Present	Sheen Present
GS-B1-A	7/17/2007	6.51	174	22.57	20.3	2.27		Silty, dark grey, clearing		
GS-B1-B	7/17/2007	6.39	1086	21.03	10.7	0.80		Silty, grey, clearing		
GS-B1-C	7/17/2007	6.13	2151	19.98	47.9	1.54		Silty, grey		
GS-B2-A1	7/17/2007	6.88	146	23.69	34.5	3.84		Silty, grey, strong odor		X
GS-B2-A2	7/17/2007	6.71	175	23.92	40.0	1.09		Silty, grey, thick sheen		X
GS-B2-B	7/17/2007	6.43	1008	20.60	44.1	0.64		Silty, grey, clearing		
GS-B2-C	7/17/2007	6.69	813	22.83	29.0	0.70		Silty, grey, clearing		
GS-B2-W-25	9/12/2007	6.65	105	18.98	119.9	5.53	390.1	Clear, colorless		
GS-B2-W-50	9/12/2007	6.49	452	18.75	14.2	2.0	over 1100	Slightly silty		
GS-B2-W-75	9/12/2007	6.40	570	19.34	-44.5	0.90	359.3	Slightly silty		
GS-B2-W-100	9/12/2007	7.04	437	20.11	-101.3	0.30	62.89	Slightly silty		
GS-B2-W-125	9/12/2007	6.90	329	22.20	-25.9	0.46	24.12	Very silty, grey		
GS-B2-W-144	9/12/2007	6.42	392	23.04	-41	0.31	42.7	Cloudy, grey		
GS-B3-A	7/19/2007	7.07	190	23.88	-21.8	0.92		Silty, grey, clearing		
GS-B3-B	7/19/2007	6.59	549	25.58	7.7	1.84		Silty, grey		
GS-B3-C	7/19/2007	6.83	831	23.78	-6.1	0.85		Silty, grey, clearing		
GS-B4-A	7/19/2007	6.81	296	22.99	23.9	0.48		Silty, grey		
GS-B4-B	7/19/2007	6.44	1300	21.11	38.2	1.04		Silty, grey		X
GS-B4-C	7/19/2007	6.82	852	22.62	18.0	1.03		Silty, grey, clearing		
GS-B5-A	7/18/2007	6.86	1110	22.28	0.6	0.70		Silty, grey, clearing		X
GS-B5-B	7/18/2007	6.58	511	22.57	-2.3	0.59		Silty, grey		X
GS-B5-C	7/18/2007	6.63	1002	20.94	-1.0	0.89		Silty, cloudy, grey		X
GS-B5-W-25	9/14/2007	6.36	614	18.26	-35	3.14	242.5	Slightly coudy, light tan		
GS-B5-W-50	9/14/2007	6.58	531	19.20	-18	1.16	381	Slightly cloudy, light grey		
GS-B5-W-75	9/14/2007	6.47	575	19.73	-36	1.02	368	Slightly coudy, light tan		
GS-B5-W-98.5	9/14/2007	6.28	489	19.52	-27	0.77	173.4	Slightly cloudy, grey		
GS-B6-A	7/6/2007	6.35	167	21.09	3.0	0.91		Silty, cloudy, light tan		
GS-B6-B	7/6/2007	6.42	216	21.71	-3.6	0.81		Silty, cloudy, tan		
GS-B6-C	7/6/2007	6.55	711	22.05	-61.0	0.60		Clear, colorless		
GS-B7-A	7/5/2007	6.17	1005	20.84	-13.7	3.01		Slightly cloudy, light grey		
GS-B7-B	7/5/2007	6.81	137	22.84	-30.0	4.80		Slightly cloudy, light grey		
GS-B7-C	7/5/2007	6.08	175	22.30	5.7	2.72		Slightly cloudy, light grey		
GS-B7-W-25	8/28/2007	6.23	853	23.15	-230.6	2.00	382.1	Slightly silty		
GS-B7-W-50	8/29/2007	6.57	573	19.53	-158.6	2.18	403.7	Slightly silty		
GS-B7-W-75	8/29/2007	6.64	691	20.22	-304.1	1.20	408.1	Slightly silty		
GS-B7-W-100	8/29/2007	6.92	743	23.34	-303.5	0.66	412.8	Slightly silty		
GS-B7-W-125	8/29/2007	7.27	151	20.4	-118	0.69	625.1	Slightly cloudy, colorless		

Table 1.2
Phase 2 Field Water Quality Parameters

Location ID	Date	pH	Conductivity (µS)	Temp (ºC)	ORP (mV)	Diss O2 (mg/l)	Turbidity (NTU)	Water Quality	NAPL Present	Sheen Present
GS-B8-A	7/9/2007	6.59	232	21.26	-20.7	0.46		Silty, dark grey		
GS-B8-B	7/9/2007	6.58	380	22.41	-30.4	0.74		Silty, grey		X
GS-B8-C	7/9/2007	6.49	1025	20.07	-40.2	0.41		Slightly cloudy, grey		
GS-B9-A	7/9/2007	6.74	138	23.85	-13.6	0.43		Silty, grey		
GS-B9-B	7/9/2007	6.54	171	25.01	18.1	4.22		Slightly cloudy, grey	X	X
GS-B9-C	7/9/2007	6.37	906	21.02	-35.0	0.38		Silty, grey		
GS-C1-A	7/16/2007	7.00	2695	25.75	-48.2	5.50		Silty, grey, gas bubbles		
GS-C1-B	7/16/2007	6.79	2338	23.11	-55.3	0.71		Silty, light grey, 'fizzy'		
GS-C1-C	7/16/2007	6.78	1345	21.29	-61.9	0.13		Clear, colorless		
GS-C2-A	7/16/2007	7.06	1018	22.45	30.1	1.26		Slightly cloudy, light tan		X
GS-C2-B	7/16/2007	7.36	1094	22.67	-8.3	0.56		Slightly cloudy, light grey		X
GS-C2-C	7/16/2007	7.49	1338	21.97	-16.1	0.50		Slightly silty, grey		X
GS-C2-W-25	9/13/2007	6.78	172	19.10	63	1.73	245	Cloudy, light tan		
GS-C2-W-50	9/13/2007	7.10	1868	19.48	-141	0.78	315	Cloudy, dark grey		
GS-C2-W-75	9/13/2007	7.20	1316	19.95	-146	0.22	198.3	Cloudy, light grey		
GS-C2-W-100	9/13/2007	7.20	1555	20.09	-88	0.45	299	Slightly cloudy, light tan		
GS-C2-W-119	9/13/2007	7.65	202	20.40	-136	0.19	358.2	Slightly cloudy, tan		
GS-C3-A	7/13/2007	7.56	845	23.50	50.0	0.88		Slightly cloudy, grey		
GS-C3-B	7/13/2007	7.33	706	22.38	19.9	0.86		Slightly cloudy, grey		
GS-C3-C	7/13/2007	7.49	887	23.31	17.1	0.24		Slightly cloudy, grey		
GS-C4-A	7/13/2007	6.95	802	21.20	32.2	0.89		Clear, grey tint		
GS-C4-B	7/13/2007	7.02	823	20.79	26.2	0.57		Slightly cloudy, grey tint		
GS-C4-C	7/13/2007	7.01	742	21.83	36.2	0.58		Slightly cloudy, grey		
GS-C5-A	7/12/2007	6.70	1349	23.36	-25.8	0.34		Slightly cloudy, grey, clearing		
GS-C5-B	7/12/2007	6.91	779	22.94	-65.3	0.29		Slightly silty, grey		
GS-C5-C	7/12/2007	6.91	685	23.53	-74.0	0.34		Slightly silty, grey		
GS-C5-W-25	9/11/2007	6.60	561	19.80	-48.5	0.79	319.8	Slightly silty		
GS-C5-W-50	9/11/2007	6.73	557	20.86	-48.0	0.78	326.5	Slightly silty		
GS-C5-W-75	9/11/2007	6.78	563	22.00	-34.4	0.23	431.2	Slightly silty		
GS-C5-W-94	9/11/2007	6.70	537	24.27	-69.8	0.17	424.4	Slightly silty		
GS-C6-A	7/12/2007	6.57	838	20.77	45.2	1.14		Clear, colorless		
GS-C6-B	7/12/2007	6.75	829	20.40	24.4	0.81		Slightly silty, light grey		
GS-C6-C	7/12/2007	6.90	831	21.11	15.5	0.76		Slightly cloudy, colorless		
GS-C7-A	7/11/2007	6.77	867	22.68	-57.4	0.36		Slightly cloudy, light grey		
GS-C7-B	7/11/2007	6.77	957	21.09	-65.5	0.71		Slightly cloudy, grey		
GS-C7-C	7/11/2007	6.84	929	24.17	-77.3	0.23		Slightly cloudy, light grey		
GS-C7-W-25	8/31/2007	6.35	147	21.42	101.8	6.09	108.0	Slightly silty, tan		

Table 1.2
Phase 2 Field Water Quality Parameters

Location ID	Date	pH	Conductivity (µS)	Temp (ºC)	ORP (mV)	Diss O2 (mg/l)	Turbidity (NTU)	Water Quality	NAPL Present	Sheen Present
GS-C7-W-50	8/31/2007	6.19	658	19.80	8.4	1.77	271.0	Slightly cloudy, colorless		
GS-C7-W-75	8/31/2007	6.61	654	18.99	-39.7	1.70	493.8	Silty, light brown		
GS-C7-W-100	8/31/2007	7.21	167	19.76	-68.7	0.89	184.1	Slity, light brown	X	X
GS-C8-A	7/11/2007	6.52	909	21.17	-20.1	0.34		Slightly cloudy, grey		X
GS-C8-B	7/11/2007	6.70	1048	20.55	-36.3	0.69		Slightly cloudy, grey		
GS-C8-C	7/11/2007	6.87	819	20.66	-15.0	0.31		Slightly cloudy, light light grey		
GS-C9-A	7/10/2007	7.06	775	23.74	-42.3	0.21		Slightly cloudy, tan		
GS-C9-B	7/10/2007	7.23	860	22.59	-20.7	0.55		Slightly cloudy, light grey		
GS-C9-C	7/10/2007	7.13	2291	22.09	-22.2	0.29		Slightly cloudy, tan		
GS-D1-A	7/20/2007	7.30	872	21.52	112.6	0.91		Clear, colorless		
GS-D1-B	7/20/2007	7.55	867	20.77	81.8	0.59		Slightly silty, greyish		
GS-D1-C	7/20/2007	7.65	971	21.48	90.1	0.50		Slightly silty, greyish		
GS-D2-A	7/20/2007	7.62	1003	21.63	71.1	0.40		Clear, colorless		
GS-D2-B	7/20/2007	7.67	816	20.92	61.8	0.35		Cloudy		
GS-D2-C	7/20/2007	7.66	684	21.30	59.2	0.33		Slightly silty, greyish		
GS-D2-W-25	9/10/2007	7.07	838	19.79	-79.2	1.33	397.1	Slightly silty		
GS-D2-W-50	9/10/2007	7.31	928	21.11	-83.0	1.22	548.1	Slightly silty		
GS-D2-W-75	9/10/2007	7.22	902	23.98	-93.3	0.39	407.4	Slightly cloudy, light tan		
GS-D2-W-100	9/10/2007	6.30	680	23.84	-20.0	0.59	589.4	Slightly silty		
GS-D3-A	7/23/2007	6.80	1367	21.49	80.3	0.77		Clear, colorless		
GS-D3-B	7/23/2007	7.27	1503	23.06	57.7	0.64		Clear, colorless		
GS-D3-C	7/23/2007	7.17	1550	22.43	90.2	0.70		Cloudy, greyish		
GS-D4-A	7/23/2007	7.36	1270	25.02	75.7	0.52		Cloudy, grey tint		
GS-D4-B	7/23/2007	7.22	2004	24.77	85.0	0.29		Slightly silty, greyish		
GS-D4-C	7/23/2007	7.07	2148	21.93	105.2	0.67		Slightly silty, greyish		
GS-D4-W-25	9/6/2007	6.82	2658	18.67	-53.0	1.85	83.48	Slightly silty		
GS-D4-W-50	9/6/2007	7.14	2065	19.55	-75.8	0.67	240.5	Slightly silty		
GS-D4-W-63	9/6/2007	6.87	3237	20.48	-80.4	0.45	over 1100	Slightly silty		
GS-D5-A	7/24/2007	7.44	776	21.35	63.7	0.67		Clear, colorless		
GS-D5-B	7/24/2007	7.50	2138	20.73	41.5	0.30		Slightly silty, greyish		
GS-D5-C	7/24/2007	7.64	2600	20.99	36.8	0.21		Cloudy, greyish		
River (38' below surface)	7/5/2007	6.70	119	20.42	3.9	10.64				
River (20' below surface)	7/9/2007	7.20	104	22.10	54.1	8.01				
River (48' below surface)	7/13/2007	8.02	110	22.40	-12.4	7.20				
River	7/19/2007	8.13	132	23.54	-72.1	6.65				

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B1		GS-B1		GS-B1		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2	
Sample ID			GS-B1-A		GS-B1-B		GS-B1-C		GS-B2-A1		GS-B2-A2		GS-B2-B		GS-B2-C		GS-B2-W-25		GS-B2-W-50		GS-B2-W-75	
Sample Date			7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		9/12/2007		9/12/2007		9/12/2007	
Depth Below Mudline			0.9 to 1.9		4.9 to 6.9		12.9 to 14.9		1.5 to 2.5		4.5 to 5.5		8.5 to 10.5		16.5 to 18.5		23 to 27		48 to 52		73 to 77	
Sample Elevation			-26.8 to -27.8		-30.8 to -32.8		-38.8 to -40.8		-31.3 to -32.3		-34.3 to -35.3		-38.3 to -40.3		-46.3 to -48.3		-38.7 to -42.7		-63.7 to -67.7		-88.7 to -92.7	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																						
Ammonia	--	--	3.06		16.4		10.1		3.79		4.59		11.4		4.77		0.08		3.12		5.67	
Amenable cyanide	--	--	0.28	J	0.05	J	0.03	J	0.01	U	0.01	U	0.35	J	0.11	J	0.01	U	0.01	U	0.01	U
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.006	J	0.023		0.026		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total Cyanide	0.14	0.0052	1.21		0.26		0.64		2.74		2.07		0.35		0.59		0.004	J	0.15		0.16	
Metals, Dissolved (mg/L)																						
Aluminum	0.05-0.2	0.087	0.0095	U	0.0027	U	0.0036	U	0.0037	U	0.0062	U					0.0052		0.0037		0.0043	
Antimony	0.006	0.03	0.00023		0.00012		0.0001		0.0005		0.00045						0.0003		0.00243		0.00176	
Arsenic	0.000014	0.0031	0.00094		0.00873		0.00901		0.00212		0.00159						0.00043	J	0.00939		0.0112	
Barium	--	--	0.0189		0.177		0.0613		0.00944		0.00883						0.00544		0.0446		0.0661	
Beryllium	--	--	0.000006	U	0.000008		0.000014		0.000006	U	0.000006	U					0.000003	U	0.000003	U	0.000003	U
Cadmium	0.005	0.000094	0.000029		0.000019		0.000012		0.000007	U	0.000007	U					0.000018	J	0.000012	J	0.000008	U
Calcium metal	--	--	9.77		79.3		175		7.69		8.13						8.93		50.1		55.8	
Chromium	0.1	--	0.00029	UJ	0.00104	J	0.00193	J	0.00051	J	0.00023	UJ					0.00056		0.00078		0.00049	
Copper	1.3	0.0027	0.00067		0.00033		0.00126		0.00079		0.00056						0.00087		0.00025		0.00009	J
Iron	--	--	3.26		83.8		241		1.24		0.763						0.988		19.1		31.8	
Lead	0.015	0.00054	0.000099	J	0.000044	J	0.000024	J	0.000144	J	0.000119	J					0.000075		0.00002	U	0.00002	U
Magnesium	--	--	3.54		27.4		71.5		3.96		3.87						2.39		17.9		21.6	
Manganese	0.01	0.12	0.501		3.43		6.03		0.301		0.322						0.0651		2.18		2.93	
Mercury	0.002	0.00077	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U					0.00003	U	0.00003	U	0.00003	U
Nickel	0.46	0.016	0.00341		0.0075		0.0087		0.00178		0.00202						0.00266		0.00492		0.00354	
Potassium	--	--	1.71		6.89		7.96		1.49		1.33						2.23	U	3.58	U	6.64	
Selenium	0.42	0.005	0.0003		0.002		0.002	U	0.0003		0.0004						0.0002	U	0.0003	J	0.0003	J
Silver	0.1	0.00036	0.00002	UJ	0.00002	UJ	0.000009	UJ	0.000009	UJ	0.000009	UJ					0.00002	U	0.00002	U	0.00002	U
Sodium	--	--	9.36		18.2		64.3		9.52		8.27						8.3		11.4		12.6	
Thallium	--	--	0.000005		0.000007		0.000004		0.000003	U	0.000004						0.00002	U	0.00002	U	0.000003	U
Zinc	26	0.036	0.00447		0.0517		0.0245		0.00293		0.00435						0.00278		0.00509		0.00563	
Metals, Total (mg/L)																						
Aluminum	0.05-0.2	--	132		88.8		41		306		239		100		50.3		1.47	J	14.3	J	32.7	J
Antimony	0.006	0.03	0.00065		0.00036		0.00021		0.00077		0.00073		0.00021		0.00021		0.00041	U	0.00199	U	0.00112	U
Arsenic	0.000014	0.0031	0.0142		0.0196		0.0109		0.0316		0.0266		0.0168		0.0161		0.00082		0.00888		0.0104	
Barium	--	--	0.717		0.652		0.337		1.53		1.18		0.581		0.301		0.0136		0.121		0.261	
Beryllium	--	--	0.00281		0.00243		0.000797		0.00589		0.00487		0.00216		0.00107		0.000026	U	0.000397		0.000993	
Cadmium	0.005	0.00038	0.00155		0.00114		0.000128		0.0034		0.00299		0.000365		0.000121		0.000029		0.000217		0.000359	
Calcium metal	--	--	39.8		101		176		85.3		62.4		101		85		9.76		53.6		69.3	
Chromium	0.1	--	0.121	J	0.108	J	0.0568	J	0.255	J	0.224	J	0.0769	J	0.0435	J	0.00741		0.0239		0.0503	
Copper	1.3	0.0036	0.194		0.135		0.041		0.377		0.342		0.0984		0.0502		0.00457		0.0285		0.047	
Iron	--	--	168		223		296		349		257		198		105		4.65		43.8		87	
Lead	0.015	0.00054	0.235	J	0.255	J	0.0379	J	0.382	J	0.377	J	0.0993	J	0.0148	J	0.00109		0.0128		0.0207	
Magnesium	--	--	28.9		46.4		77.6		66.9		50.1		48.6		40.8		2.77		20.5		32.4	
Manganese	0.01	0.12	2.81		5.92		6.29		5.15		3.16		5.48		4.79		0.103		2.67		4.15	
Mercury	0.0000146	0.000012	0.00058		0.00064		0.00003	U	0.00294		0.00296		0.00023		0.00004		0.00003	U	0.00016	J	0.0003	
Nickel	0.46	0.049	0.155		0.102		0.0532		0.367		0.466		0.0776		0.0476		0.00604		0.0141		0.0276	
Potassium	--	--	5.99		10		9.08		11.4		9.56		9.42		7.38		2	U	5.83		6.44	
Selenium	0.42	0.035	0.001	U	0.0033		0.0023		0.0031		0.0029		0.0018		0.001		0.0002	U	0.0003	J	0.0007	J
Silver	0.1	0.00012	0.000645	J	0.00115	J	0.000081	UJ	0.000317	UJ	0.000267	UJ	0.000439	J	0.000142	UJ	0.000026	U	0.0002		0.000273	
Sodium	--	--	12.7		20.3		62.1		19.4		14.9		16.7		14.9		8.53		12		14.8	
Thallium	--	--	0.000417		0.000311		0.000111		0.000512		0.000466		0.000268		0.000148		0.000013	U	0.000052		0.000101	
Zinc	26	0.033	1.02		0.847		0.309		1.3		1.27		0.35		0.222		0.0143		0.057		0.108	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B1		GS-B1		GS-B1		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2	
Sample ID			GS-B1-A		GS-B1-B		GS-B1-C		GS-B2-A1		GS-B2-A2		GS-B2-B		GS-B2-C		GS-B2-W-25		GS-B2-W-50		GS-B2-W-75	
Sample Date			7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		9/12/2007		9/12/2007		9/12/2007	
Depth Below Mudline			0.9 to 1.9		4.9 to 6.9		12.9 to 14.9		1.5 to 2.5		4.5 to 5.5		8.5 to 10.5		16.5 to 18.5		23 to 27		48 to 52		73 to 77	
Sample Elevation			-26.8 to -27.8		-30.8 to -32.8		-38.8 to -40.8		-31.3 to -32.3		-34.3 to -35.3		-38.3 to -40.3		-46.3 to -48.3		-38.7 to -42.7		-63.7 to -67.7		-88.7 to -92.7	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																						
2-Methylnaphthalene	0.2	2.1	**0.62**		**0.54**		**0.025**		**140**		**92**		**0.83**		**2.1**		**0.029**		**2**		**2.5**	
Acenaphthene	0.2	520	**14**		**51**		**1.7**		**190**		**110**		**9.9**		**3.2**		**0.37**		**1.7**		**3.3**	
Acenaphthylene	0.2	--	**1.3**		**1.2**		**0.038**		**4.5**		**5.4**		**0.33**		**0.29**		**0.089**		**0.045**		**0.042**	
Anthracene	0.2	0.73	**11**		**19**		**0.21**		**110**		**92**		**1.3**		**4.1**		**0.012**	**J**	**0.024**		**0.073**	
Benzo(a)anthracene	0.0018	0.027	**13**		**20**		**0.28**		**60**		**100**		**3.2**		**4**		**0.0078**	**J**	**0.0045**	**J**	**0.051**	
Benzo(a)pyrene	0.0018	0.014	**14**		**29**		**0.23**		**50**		**110**		**4**		**4.2**		0.021	U	0.021	U	**0.02**	**J**
Benzo(b)fluoranthene	0.0018	--	**13**		**21**		**0.22**		**45**		**83**		**3.2**		**3.5**		**0.0045**	**J**	**0.037**		**0.061**	
Benzo(g,h,i)perylene	0.2	--	**13**		**27**		**0.23**		**39**		**90**		**4.2**		**3.6**		**0.0037**	**J**	**0.017**	**J**	**0.047**	
Benzo(k)fluoranthene	0.0018	--	**4.7**		**7**		**0.07**		**15**		**26**		**1**		**1.2**		0.021	U	**0.0078**	**J**	**0.015**	**J**
Chrysene	0.0018	--	**15**		**24**		**0.37**		**79**		**130**		**4.1**		**5.3**		**0.0073**	**J**	**0.03**		**0.06**	
Dibenzo(a,h)anthracene	0.0018	--	**1.5**		**2.2**		**0.023**		**5**		**12**		**0.41**		**0.43**		0.021	U	0.021	U	**0.005**	**J**
Dibenzofuran	12	3.7	**2.3**		**0.91**		**0.03**		**17**		**9.8**		**0.16**		**0.29**		**0.046**		**0.098**		**0.2**	
Fluoranthene	0.2	--	**47**		**100**		**1.1**		**270**		**260**		**18**		**12**		**0.16**		**0.12**		**0.21**	
Fluorene	0.2	3.9	**9.3**		**11**		**0.17**		**110**		**66**		**2.4**		**2.2**		**0.2**		**0.5**		**1.3**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**13**		**26**		**0.22**		**46**		**80**		**4**		**3.6**		0.021	U	**0.019**	**J**	**0.045**	
Naphthalene	0.2	12	**2.3**		**5.7**		**0.072**		**120**		**180**		**2.6**		**9.7**		0.053	U	**14**		**0.44**	
Phenanthrene	0.2	--	**56**		**110**		**1.1**		**520**		**380**		**25**		**15**		**1.2**		**0.36**		**1.8**	
Pyrene	0.2	--	**44**		**100**		**1.2**		**270**		**290**		**18**		**13**		**0.14**		**0.099**		**0.23**	
VOC (ug/L)																						
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	20	UJ	20	UJ	20	UJ	**4.2**	**J**	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	**0.2**	**J**	**0.26**	**J**	0.5	U	**8.8**		**5.7**		0.5	U	0.5	U	0.5	U	**0.14**	**J**	**0.16**	**J**
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
Carbon disulfide	1000	0.92	**0.25**	**J**	**0.18**	**J**	**0.22**	**J**	0.5	U	**0.17**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	**0.31**	**J**
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B1		GS-B1		GS-B1		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2		GS-B2	
Sample ID			GS-B1-A		GS-B1-B		GS-B1-C		GS-B2-A1		GS-B2-A2		GS-B2-B		GS-B2-C		GS-B2-W-25		GS-B2-W-50		GS-B2-W-75	
Sample Date			7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		7/17/2007		9/12/2007		9/12/2007		9/12/2007	
Depth Below Mudline			0.9 to 1.9		4.9 to 6.9		12.9 to 14.9		1.5 to 2.5		4.5 to 5.5		8.5 to 10.5		16.5 to 18.5		23 to 27		48 to 52		73 to 77	
Sample Elevation			-26.8 to -27.8		-30.8 to -32.8		-38.8 to -40.8		-31.3 to -32.3		-34.3 to -35.3		-38.3 to -40.3		-46.3 to -48.3		-38.7 to -42.7		-63.7 to -67.7		-88.7 to -92.7	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	0.5	U	0.5	U	0.5	U	0.81	U	0.5	U	0.5	U	**0.28**	**J**	0.5	U	0.5	U	0.5	U
cis-1,2-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	0.5	U	0.5	U	0.5	U	**33**		**22**		**0.29**	**J**	**0.45**	**J**	0.5	U	**0.22**	**J**	**0.27**	**J**
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	--	--	**4.9**	**J**	**4.9**	**J**	**4.8**	**J**	**4.8**	**J**	5	U	5	U	5	U	5	U	5	U	5	U
Isopropylbenzene	660	--	**0.22**	**J**	**0.12**	**J**	2	U	**2.9**		**2.1**		2	U	2	U	2	U	**0.11**	**J**	**0.14**	**J**
m,p-Xylenes	--	1.8	0.5	U	**0.27**	**J**	0.5	U	**1.2**		**0.92**		0.5	U	0.5	U	0.5	U	**0.48**	**J**	**0.33**	**J**
Methyltert-butylether	37	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	0.2	12	**0.66**	**J**	**1**	**J**	2	U	**100**		**94**		**1.1**	**J**	**11**		**0.53**		**48**		**3**	
o-Xylene	1400	13	**0.14**	**J**	**0.17**	**J**	0.5	U	**2.9**		**1.7**		**0.13**	**J**	**0.12**	**J**	0.5	U	**0.18**	**J**	**0.14**	**J**
Styrene	100	--	0.5	U	0.5	U	0.5	U	**0.18**	**J**	**0.13**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**18**		**15**		**1.6**		**14**		**41**		**2.7**		**2.6**		**2.6**		**96**		**52**	
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B2		GS-B2		GS-B2		GS-B3		GS-B3		GS-B3		GS-B4		GS-B4		GS-B4		GS-B5		GS-B5		GS-B5	
Sample ID			GS-B2-W-100		GS-B2-W-125		GS-B2-W-144		GS-B3-A		GS-B3-B		GS-B3-C		GS-B4-A		GS-B4-B		GS-B4-C		GS-B5-A		GS-B5-B		GS-B5-C	
Sample Date			9/12/2007		9/12/2007		9/12/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/18/2007		7/18/2007		7/18/2007	
Depth Below Mudline			98 to 102		123 to 127		140 to 144		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		1.6 to 2.6		5.6 to 7.6		13.6 to 15.6	
Sample Elevation			-113.7 to -117.7		-138.7 to -142.7		-155.7 to -159.7		-35.2 to -36.2		-39.2 to -41.2		-47.2 to -49.2		-32.7 to -33.7		-36.7 to -38.7		-44.7 to -46.7		-29.8 to -30.8		-33.8 to -35.8		-41.8 to -43.8	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																										
Ammonia	--	--	2.61		14.2		16.7		1.05		4.18		6.22		9.19		15.7		8.62		8.51		7.49		7.05	
Amenable cyanide	--	--	0.01	U	0.01	UJ	0.01	UJ	0.01	U	0.01	U	0.01	U	0.04		0.01	U	0.01	U	0.02	J	0.01	U	0.02	J
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ
Total Cyanide	0.14	0.0052	0.15		0.34		0.33		0.45		0.1		0.21		0.23		0.3		0.1		0.08		0.1		0.45	
Metals, Dissolved (mg/L)																										
Aluminum	0.05-0.2	0.087	0.012		0.0251		0.0207								0.0109						0.0053		0.004		0.0013	
Antimony	0.006	0.03	0.00252		0.00396		0.00696								0.00019						0.00028		0.00056		0.00018	
Arsenic	0.000014	0.0031	0.00296		0.001		0.00209								0.00237						0.00552		0.00132		0.00402	
Barium	--	--	0.0271		0.0256		0.0437								0.0404						0.102		0.0681		0.1	
Beryllium	--	--	0.000003	U	0.000003	U	0.000003	U							0.000003	U					0.000003	U	0.000003	U	0.000003	
Cadmium	0.005	0.000094	0.000008	J	0.000009	J	0.000009	J							0.000009						0.000013		0.000013		0.000008	U
Calcium metal	--	--	44		13.2		26.2								17.2						58.4		33.6		90.7	
Chromium	0.1	--	0.00075		0.0003		0.00037								0.00045						0.00069		0.00044		0.0005	
Copper	1.3	0.0027	0.0001		0.00021		0.0003								0.00028						0.00028		0.00024		0.0001	U
Iron	--	--	6.88		0.853		11.9								10.3						25.6		18.1		55.8	
Lead	0.015	0.00054	0.000031	U	0.000118		0.000142								0.000052						0.00006		0.000089		0.000021	U
Magnesium	--	--	9.48		4.41		9.24								5.42						16		12		34.1	
Manganese	0.01	0.12	0.634		0.228		0.595								1.72						5.02		0.623		5.18	
Mercury	0.002	0.00077	0.00003	U	0.00003	U	0.00003	U							0.00003	U					0.00003	U	0.00003	U	0.00003	U
Nickel	0.46	0.016	0.00196		0.0025		0.00281								0.00132						0.00636		0.00644		0.00127	
Potassium	--	--	4.55	U	2.65	U	4.08	U							2.14						2.85		2.55		3.92	
Selenium	0.42	0.005	0.0002	U	0.0002	U	0.0003	J							0.0002	U					0.0002	U	0.0004		0.0005	
Silver	0.1	0.00036	0.00002	U	0.000003	U	0.00002	U							0.00002	U					0.000003	U	0.000003	U	0.000003	U
Sodium	--	--	33.6		10.1		12.8								9.29						10.3		10.7		14.3	
Thallium	--	--	0.000003	U	0.000003	U	0.000003	U							0.00002	U					0.00002	U	0.00002	U	0.00002	U
Zinc	26	0.036	0.00272		0.00313		0.00342								0.00397						0.0225		0.00598		0.00402	
Metals, Total (mg/L)																										
Aluminum	0.05-0.2	--	179	J	345	J	687	J	45.6		14		17.8		832		88.2		42.2		93.2		79.8		8.19	
Antimony	0.006	0.03	0.0016	U	0.00073	U	0.001	U	0.00011	J	0.00028	J	0.00002	UJ	0.0002	U	0.0001	U	0.00007		0.0001	UJ	0.00016	J	0.0002	J
Arsenic	0.000014	0.0031	0.0146		0.024		0.0404		0.00441		0.00294		0.0134		0.0179		0.0197		0.0112		0.013		0.00998		0.00461	
Barium	--	--	0.837		1.73		3.68		0.326		0.126		0.173		4.63		0.855		0.368		0.769		0.666		0.138	
Beryllium	--	--	0.0043		0.00835		0.0179		0.00144		0.000396		0.000559		0.011		0.00324		0.0016		0.00302		0.00259		0.000256	
Cadmium	0.005	0.00038	0.00155		0.00532		0.0109		0.000767		0.000174		0.000062		0.00332		0.00192		0.000243		0.00166		0.00157		0.000059	
Calcium metal	--	--	111		113		238		25.1		27.7		81.3		213		132		95.3		87		60		93.1	
Chromium	0.1	--	0.255		0.495		0.976		0.0407		0.0259		0.0136		0.206		0.0734		0.0459		0.086		0.0801		0.00819	
Copper	1.3	0.0036	0.245		0.521		1.13		0.0752		0.0284		0.0193		0.468		0.166		0.0666		0.171		0.135		0.00984	
Iron	--	--	283		498		1060		70.7		45.5		67.5		1110		230		132		164		149		72.1	
Lead	0.015	0.00054	0.0948		0.294		0.583		0.0584		0.0225		0.00372		0.186		0.122		0.0135		0.11		0.116		0.00407	
Magnesium	--	--	56.4		83.3		187		16.9		11.4		33.6		223		64.3		48		43.1		36.1		36.8	
Manganese	0.01	0.12	5.51		10.2		24.6		1.32		1.14		4.69		24.9		8.39		4.64		8.13		2.99		5.43	
Mercury	0.0000146	0.000012	0.00109		0.00303		0.0056		0.00019		0.0001		0.00003	U	0.00238		0.00085		0.00003		0.0007		0.00074		0.00003	U
Nickel	0.46	0.049	0.138		0.221		0.443		0.0396		0.0278		0.0209		0.19		0.0946		0.0612		0.0859		0.0768		0.009	
Potassium	--	--	11.8		12.9		27.7		3.32		2.72		6.72		30.2		11.5		6.62		6.4		5.6		4.25	
Selenium	0.42	0.035	0.0004		0.001		0.0014		0.0002	U	0.0002	U	0.0004		0.0031		0.001	U	0.0002	U	0.001	U	0.001	U	0.0006	
Silver	0.1	0.00012	0.00109		0.00278		0.00554		0.000219		0.000126		0.000028	U	0.0023		0.00107		0.000081		0.00134		0.00113		0.000047	
Sodium	--	--	42.8		21.4		35.7		10.7		10.3		13.9		28		17.6		13.8		13.7		13.6		14.9	
Thallium	--	--	0.000425		0.00068		0.00105		0.000118		0.000049		0.000055		0.000548		0.000243		0.000096		0.000252		0.000234		0.000028	
Zinc	26	0.033	0.52		1.36		2.89		0.384		0.223		0.096		3.59		1.03		0.622		0.826		0.807		0.043	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B2		GS-B2		GS-B2		GS-B3		GS-B3		GS-B3		GS-B4		GS-B4		GS-B4		GS-B5		GS-B5		GS-B5	
Sample ID			GS-B2-W-100		GS-B2-W-125		GS-B2-W-144		GS-B3-A		GS-B3-B		GS-B3-C		GS-B4-A		GS-B4-B		GS-B4-C		GS-B5-A		GS-B5-B		GS-B5-C	
Sample Date			9/12/2007		9/12/2007		9/12/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/18/2007		7/18/2007		7/18/2007	
Depth Below Mudline			98 to 102		123 to 127		140 to 144		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		1.6 to 2.6		5.6 to 7.6		13.6 to 15.6	
Sample Elevation			-113.7 to -117.7		-138.7 to -142.7		-155.7 to -159.7		-35.2 to -36.2		-39.2 to -41.2		-47.2 to -49.2		-32.7 to -33.7		-36.7 to -38.7		-44.7 to -46.7		-29.8 to -30.8		-33.8 to -35.8		-41.8 to -43.8	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																										
2-Methylnaphthalene	0.2	2.1	**5.6**		**12**		**5.1**		**0.51**		**0.18**		**0.025**		**15**		**450**		**0.56**		**92**		**150**		**0.8**	
Acenaphthene	0.2	520	**3.8**		**18**		**7**		**4.7**		**11**		**0.27**		**49**		**570**		**1.3**		**170**		**140**		**100**	
Acenaphthylene	0.2	--	**0.1**		**0.39**		**0.079**		**1**		**0.2**		**0.03**		**1.1**		**17**		**0.079**		**6**		**3.6**		**0.52**	
Anthracene	0.2	0.73	**0.062**		**5.5**		**0.91**		**1.7**		**2.3**		**0.05**		**9.1**		**130**		**0.59**		**40**		**32**		**5**	
Benzo(a)anthracene	0.0018	0.027	**0.033**		**3.9**		**0.53**		**6.5**		**2.4**		0.022	U	**6**		**80**		**0.47**		**33**		**19**		**2.3**	
Benzo(a)pyrene	0.0018	0.014	0.055	U	**2.9**		**0.46**		**7**		**3**		**0.0054**	**J**	**6.3**		**94**		**0.46**		**40**	**J**	**19**	**J**	**2.3**	**J**
Benzo(b)fluoranthene	0.0018	--	**0.95**		**3.9**		**0.55**		**6.6**		**2.3**		**0.0056**	**J**	**5.8**		**72**		**0.41**		**32**		**16**		**2**	
Benzo(g,h,i)perylene	0.2	--	**0.46**		**2.9**		**0.41**		**8.1**		**2.9**		0.022	U	**6.6**		**89**		**0.44**		**36**		**19**		**2.1**	
Benzo(k)fluoranthene	0.0018	--	**0.21**		**1.1**		**0.15**		**2.4**		**0.78**		0.022	U	**2.3**		**26**		**0.14**		**11**		**5.8**		**0.68**	
Chrysene	0.0018	--	**0.83**		**4.8**		**0.63**		**8.5**		**3.1**		**0.0079**	**J**	**8.1**		**91**		**0.63**		**40**		**23**		**2.8**	
Dibenzo(a,h)anthracene	0.0018	--	**0.041**	**J**	**0.29**		**0.042**		**0.99**		**0.27**		0.022	U	**0.77**		**7.3**		**0.039**		**3.8**		**2.5**		**0.23**	
Dibenzofuran	12	3.7	**0.48**		**1.4**		**0.38**		**0.3**		**0.48**		0.022	U	**0.33**	**J**	**24**		**0.065**		**7.2**		**11**		**2.8**	
Fluoranthene	0.2	--	**3.7**		**21**		**2.8**		**21**		**10**		**0.053**		**29**		**330**		**1.9**		**120**		**83**		**12**	
Fluorene	0.2	3.9	**2.7**		**8.6**		**2.5**		**2.2**		**3.1**		**0.031**		**18**		**160**		**0.51**		**54**		**50**		**20**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**0.66**		**2.6**		**0.38**		**7.3**		**2.7**		**0.0055**	**J**	**6**		**80**		**0.42**		**33**		**17**		**2.1**	
Naphthalene	0.2	12	**1.8**		**4.2**		**1.9**		**1.6**		**0.89**		**0.017**	**J**	**4**		**39**		**0.48**		**980**		**55**		**4.8**	
Phenanthrene	0.2	--	**8.3**		**46**		**8.3**		**10**		**12**		**0.14**		**57**		**710**		**2.6**		**240**		**210**		**49**	
Pyrene	0.2	--	**2.6**		**25**		**3.1**		**23**		**12**		**0.057**		**27**		**440**		**2.1**		**140**		**93**		**13**	
VOC (ug/L)																										
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.24**	**J**	0.5	U	0.5	U	**0.32**	**J**	1	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	4	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	4	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	**3.9**	**J**	20	UJ	20	UJ	**36**	**J**	20	UJ	20	UJ	20	UJ	20	UJ	40	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	10	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	40	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	40	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	**18**	**J**	**9.8**	**J**	20	UJ	**11**	**J**	20	UJ	20	UJ	20	UJ	20	UJ	40	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	40	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	10	UJ	5	UJ	5	UJ
Benzene	1.2	130	**0.22**	**J**	**1.1**		**1.7**		0.5	U	**0.36**	**J**	0.5	U	0.5	U	**54**		0.5	U	**2.2**		**2**		**0.62**	
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Carbon disulfide	1000	0.92	**0.56**		**1.6**		**1.3**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.17**	**J**	0.5	U	**0.3**	**J**	**0.17**	**J**	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B2		GS-B2		GS-B2		GS-B3		GS-B3		GS-B3		GS-B4		GS-B4		GS-B4		GS-B5		GS-B5		GS-B5	
Sample ID			GS-B2-W-100		GS-B2-W-125		GS-B2-W-144		GS-B3-A		GS-B3-B		GS-B3-C		GS-B4-A		GS-B4-B		GS-B4-C		GS-B5-A		GS-B5-B		GS-B5-C	
Sample Date			9/12/2007		9/12/2007		9/12/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/19/2007		7/18/2007		7/18/2007		7/18/2007	
Depth Below Mudline			98 to 102		123 to 127		140 to 144		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		1.6 to 2.6		5.6 to 7.6		13.6 to 15.6	
Sample Elevation			-113.7 to -117.7		-138.7 to -142.7		-155.7 to -159.7		-35.2 to -36.2		-39.2 to -41.2		-47.2 to -49.2		-32.7 to -33.7		-36.7 to -38.7		-44.7 to -46.7		-29.8 to -30.8		-33.8 to -35.8		-41.8 to -43.8	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Chloromethane	2.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.34**	**J**	**0.28**	**J**	**0.33**	**J**	**0.46**	**J**	0.5	U	**1.1**	
cis-1,2-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	U	1	UJ	0.5	UJ	0.5	UJ
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	4	U	2	U	2	U
Ethylbenzene	210	7.3	**0.5**		**1.4**		**3.4**		0.5	U	**0.28**	**J**	0.5	U	0.5	U	**36**		0.5	U	**11**		**7.7**		**2.1**	
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	4	U	2	U	2	U
Iodomethane	--	--	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	UJ	5	U	10	UJ	5	UJ	5	UJ
Isopropylbenzene	660	--	**0.3**	**J**	**0.61**	**J**	**1.6**	**J**	2	U	**0.74**	**J**	2	U	**0.57**	**J**	**18**		2	U	**5.7**		**6.2**		**4.2**	
m,p-Xylenes	--	1.8	**0.23**	**J**	**0.32**	**J**	**0.63**		0.5	U	**0.44**	**J**	0.5	U	0.5	U	**3.1**		0.5	U	**2.9**		**1.1**		**0.58**	
Methyltert-butylether	37	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Naphthalene	0.2	12	**6.2**		**24**		**31**		2	U	**0.45**	**J**	2	U	**6**		**53**		**0.67**	**J**	**1800**		**81**		**9.4**	
o-Xylene	1400	13	**0.17**	**J**	**0.39**	**J**	**0.83**		0.5	U	**0.71**		**0.22**	**J**	**0.12**	**J**	**18**		0.5	U	**8.1**		**2.8**		**2.5**	
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Toluene	1000	9.8	**9.7**		**13**		**21**		**0.79**		**16**		**0.68**		**0.88**		**6.3**		**4.4**		**22**		**100**		**5.7**	
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	20	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	10	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	0.5	U	**0.05**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	1	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B5		GS-B5		GS-B5		GS-B5		GS-B5		GS-B6		GS-B6		GS-B6		GS-B7		GS-B7		GS-B7		GS-B7		GS-B7	
Sample ID			GS-B5-W-25		GS-B5-W-50		GS-B5-W-50 Dup		GS-B5-W-75		GS-B5-W-98.5		GS-B6-A		GS-B6-B		GS-B6-C		GS-B7-A		GS-B7-B		GS-B7-C		GS-B7-W-25		GS-B7-W-50	
Sample Date			9/14/2007		9/14/2007		9/14/2007		9/14/2007		9/14/2007		7/6/2007		7/6/2007		7/6/2007		7/5/2007		7/5/2007		7/5/2007		8/28/2007		8/29/2007	
Depth Below Mudline			23 to 27		48 to 52		48 to 52		73 to 77		94.5 to 98.5		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52	
Sample Elevation			-43.1 to -47.1		-68.1 to -72.1		-68.1to -72.1		-93.1 to -97.1		-114.6 to -118.6		-32.9 to -33.9		-36.9 to -38.9		-44.9 to -46.9		-31.1 to -32.1		-35.1 to -37.1		-43.1 to -45.1		-51.9 to -55.9		-76.9 to -80.9	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																												
Ammonia	--	--	5.78		5.02		5.03		4.44		4.82		3.44		4.03		6.06		19.1		4.32		0.51		5.41		5.88	
Amenable cyanide	--	--	0.01	UJ	0.03	J	0.06	J	0.01	UJ	0.01	UJ	0.01	U	0.01	U	0.08		0.01	U	0.01	U	0.01	U	0.03		0.01	U
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.008	J	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total Cyanide	0.14	0.0052	0.44		0.46		0.47		0.09		0.11		0.06	J	0.08	J	0.22	J	0.1		0.01	U	0.007	J	0.49		0.29	
Metals, Dissolved (mg/L)																												
Aluminum	0.05-0.2	0.087	0.0025		0.002	J	0.0025		0.0054		0.0065														0.0029		0.0026	
Antimony	0.006	0.03	0.00132		0.00176		0.00178		0.00119		0.00188														0.00087		0.00184	
Arsenic	0.000014	0.0031	0.00491		0.00357		0.00358		0.00163		0.00079														0.0045		0.00408	
Barium	--	--	0.0629		0.0607		0.0599		0.0464		0.0467														0.0807		0.0587	
Beryllium	--	--	0.000003	U	0.000003	U	0.000003	U	0.000003	U	0.000003	U													0.000003	U	0.000003	U
Cadmium	0.005	0.000094	0.000008	U	0.000008	U	0.000009	J	0.000008	U	0.000013	J													0.000008	U	0.000008	U
Calcium metal	--	--	66.2		62.5		63.2		59.8		53.2														77.5		49.6	
Chromium	0.1	--	0.00124		0.00059		0.00115		0.00083		0.0004														0.00072		0.0009	
Copper	1.3	0.0027	0.00009	J	0.00008	J	0.0001		0.00007	J	0.00029														0.0002		0.00013	
Iron	--	--	36.1		28		28.3		24.4		20.5														42.1		21.3	
Lead	0.015	0.00054	0.00002	U	0.00002	U	0.000029	U	0.00002	U	0.000049														0.000027		0.00002	U
Magnesium	--	--	25.9		25.8		26.3		22.4		29.2														29		22.9	
Manganese	0.01	0.12	2.64		3.2		3.23		1.76		0.765														4.48		1.36	
Mercury	0.002	0.00077	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U													0.00003	U	0.00003	U
Nickel	0.46	0.016	0.00278		0.00442		0.00458		0.00281		0.00642														0.00396		0.00369	
Potassium	--	--	3.83	U	2.55	U	3.47		6.04		4.82	U													3.92		5.15	
Selenium	0.42	0.005	0.0003	J	0.0004	J	0.0003	J	0.0002	U	0.0002	U													0.0002	UJ	0.0002	UJ
Silver	0.1	0.00036	0.000003	U	0.000003	U	0.000003	U	0.000003	U	0.000003	U													0.000003	U	0.000003	U
Sodium	--	--	11.5		13.5		13.6		11.9		17.3														13.5		11.1	
Thallium	--	--	0.000003	U	0.000003	U	0.000003	U	0.000003	U	0.000003	U													0.000003	U	0.000003	U
Zinc	26	0.036	0.0112		0.00876		0.0106		0.00627		0.0113														0.0114		0.00917	
Metals, Total (mg/L)																												
Aluminum	0.05-0.2	--	21.1	J	44	J	42.1	J	43.3	J	159	J	143		314		22.3		141		111		11.8		26.1		21	
Antimony	0.006	0.03	0.00081	U	0.00083	U	0.00083	U	0.00077	U	0.00107	U	0.00012	J	0.00012	J	0.00003	UJ	0.00012	J	0.00013	J	0.00011	J	0.00096		0.00196	
Arsenic	0.000014	0.0031	0.00489		0.00513		0.00505		0.00372		0.01		0.0134	J	0.0236	J	0.00545	J	0.0168	J	0.0122	J	0.00168	J	0.00518		0.00679	
Barium	--	--	0.164		0.285		0.27		0.248		0.747		1.24		2.45		0.181		1.37		0.91		0.09		0.469		0.366	
Beryllium	--	--	0.00055		0.00124		0.00119		0.00111		0.00394		0.00462		0.00875		0.000507		0.00362		0.00349		0.000305		0.0021		0.00154	
Cadmium	0.005	0.00038	0.000089		0.00029		0.000275		0.000344		0.0013		0.002		0.00826		0.00005		0.00288		0.00193		0.000158		0.000274		0.0003	
Calcium metal	--	--	73.7		76		75.9		77.2		99.7		58.9		113		66.5		139		46.6		12.5		97.8		66	
Chromium	0.1	--	0.0248		0.0619		0.0618		0.0634		0.229		0.248		0.447		0.113		0.278		0.224		0.048		0.103		0.268	
Copper	1.3	0.0036	0.026		0.0631		0.0618		0.0586		0.243		0.339		0.709		0.038		0.382		0.26		0.036		0.0749		0.0908	
Iron	--	--	72.1		102		99.6		96.1		270		220		424		67.9		289		183		26		164		123	
Lead	0.015	0.00054	0.00492		0.0131		0.013		0.0215		0.0963		0.163		0.715		0.00483		0.194		0.188		0.0131		0.0163		0.0163	
Magnesium	--	--	33.5		39.6		39.2		36.2		71.2		40.5		87.2		29.4		69.5		32		5.3		48.6		38.8	
Manganese	0.01	0.12	3.07		4.22		4.21		2.77		3.93		5.14		6.55		3.23		9.42		4.82		0.503		6.36		2.89	
Mercury	0.0000146	0.000012	0.00003	U	0.00008	J	0.00007	J	0.00025		0.00066		0.00064		0.00132		0.00003	U	0.00091		0.00057		0.0002	U	0.0001	J	0.00008	J
Nickel	0.46	0.049	0.0188		0.0333		0.0329		0.0312		0.127		0.113		0.188		0.026		0.113		0.0988		0.0187		0.0644		0.0598	
Potassium	--	--	5.16	U	5.21	U	5.63	U	6.81		10.9		6.92		13.6		4.82		9.49		6.41		2.9		6.64		7.71	
Selenium	0.42	0.035	0.0006	J	0.0008	J	0.0007	J	0.0004	J	0.0006		0.001	UJ	0.001	UJ	0.0005	UJ	0.0004	UJ	0.001	UJ	0.0005	UJ	0.0004	UJ	0.0004	UJ
Silver	0.1	0.00012	0.00004	U	0.000136		0.000131		0.000242		0.0012		0.00209		0.00291		0.000058		0.00194		0.00146		0.000193		0.00008	U	0.000217	U
Sodium	--	--	12.9		15.4		15.5		15.2		24.3		14.2		21		13.5		23.5		14.3		10.4		16.2		13.6	
Thallium	--	--	0.000047		0.000104		0.000096		0.000099		0.000401		0.000497		0.00108		0.000069		0.00051		0.000513		0.000056		0.000208		0.000155	
Zinc	26	0.033	0.057		0.134		0.134		0.124		0.532		1.09		4.27		0.095		1.34		1.13		0.153		0.158		0.219	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B5		GS-B5		GS-B5		GS-B5		GS-B5		GS-B6		GS-B6		GS-B6		GS-B7		GS-B7		GS-B7		GS-B7		GS-B7	
Sample ID			GS-B5-W-25		GS-B5-W-50		GS-B5-W-50 Dup		GS-B5-W-75		GS-B5-W-98.5		GS-B6-A		GS-B6-B		GS-B6-C		GS-B7-A		GS-B7-B		GS-B7-C		GS-B7-W-25		GS-B7-W-50	
Sample Date			9/14/2007		9/14/2007		9/14/2007		9/14/2007		9/14/2007		7/6/2007		7/6/2007		7/6/2007		7/5/2007		7/5/2007		7/5/2007		8/28/2007		8/29/2007	
Depth Below Mudline			23 to 27		48 to 52		48 to 52		73 to 77		94.5 to 98.5		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52	
Sample Elevation			-43.1 to -47.1		-68.1 to -72.1		-68.1to -72.1		-93.1 to -97.1		-114.6 to -118.6		-32.9 to -33.9		-36.9 to -38.9		-44.9 to -46.9		-31.1 to -32.1		-35.1 to -37.1		-43.1 to -45.1		-51.9 to -55.9		-76.9 to -80.9	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																												
2-Methylnaphthalene	0.2	2.1	**1.1**		**2.5**		**3.3**		**6.5**		**20**		**3.5**		**37**		**0.078**		**0.11**		**19**		**140**		**3**		**0.65**	
Acenaphthene	0.2	520	**2.2**		**4**		**5**		**15**		**45**		**100**		**91**		**0.17**		**45**		**82**		**120**		**1.8**		**0.61**	
Acenaphthylene	0.2	--	**0.027**		**0.034**		**0.056**		**0.072**		**0.17**		**0.7**		**0.94**		**0.026**		**0.26**		**0.45**		**42**		**2.4**		**0.5**	
Anthracene	0.2	0.73	**0.043**		**0.049**		**0.038**		**0.89**		**0.77**		**16**		**14**		**0.13**		**2.1**		**12**		**53**		**1.5**		**0.41**	
Benzo(a)anthracene	0.0018	0.027	**0.0053**	**J**	**0.0048**	**J**	**0.0048**	**J**	**0.021**	**J**	**0.068**		**5**		**4.1**		**0.11**		**0.4**		**3.4**		**39**		**1.3**		**0.4**	
Benzo(a)pyrene	0.0018	0.014	0.021	U	0.021	U	0.023	U	**0.0053**	**J**	**0.047**		**3.9**		**3.4**		**0.13**		**0.26**		**2**		**46**		**1.7**		**0.49**	
Benzo(b)fluoranthene	0.0018	--	**0.0043**	**J**	0.021	U	0.023	U	**0.0075**	**J**	**0.058**		**3.3**		**2.9**		**0.12**		**0.24**		**1.8**		**36**		**1.4**		**0.43**	
Benzo(g,h,i)perylene	0.2	--	**0.0068**	**J**	0.021	U	0.023	U	**0.0063**	**J**	**0.042**		**2.4**		**2.4**		**0.12**		**0.22**		**1.1**		**37**		**1.5**		**0.44**	
Benzo(k)fluoranthene	0.0018	--	0.021	U	0.021	U	0.023	U	0.023	U	**0.015**	**J**	**1.2**		**1**		**0.038**		**0.08**		**0.58**		**12**		**0.44**		**0.14**	
Chrysene	0.0018	--	0.021	U	0.021	U	0.023	U	**0.014**	**J**	**0.064**		**8.6**		**5.1**		**0.15**		**0.51**		**3.8**		**44**		**1.5**		**0.46**	
Dibenzo(a,h)anthracene	0.0018	--	0.021	U	0.021	U	0.023	U	0.023	U	**0.0043**	**J**	**0.33**		**0.32**		**0.013**	**J**	**0.024**		**0.13**		**4.4**		**0.2**		**0.056**	
Dibenzofuran	12	3.7	**0.13**		**0.17**		**0.21**		**0.56**		**1.4**		**2**		**8.2**		**0.017**	**J**	**0.24**		**19**		**10**		**0.26**		**0.071**	
Fluoranthene	0.2	--	**0.16**		**0.055**		**0.057**		**1.1**		**0.86**		**40**		**26**		**0.42**		**4.7**		**24**		**200**		**6.1**		**1.6**	
Fluorene	0.2	3.9	**0.79**		**1**		**1.3**		**4**		**10**		**33**		**33**		**0.092**		**13**		**36**		**61**		**1.7**		**0.42**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**0.0053**	**J**	0.021	U	0.023	U	**0.0056**	**J**	**0.041**		**2.4**		**2.3**		**0.13**		**0.21**		**1.2**		**39**		**1.5**		**0.45**	
Naphthalene	0.2	12	**5.6**		**34**		**45**		**62**		**220**		**8.5**		**13**		**0.059**		**0.45**		**43**		**850**		**34**		**10**	
Phenanthrene	0.2	--	**2.7**		**2.7**		**3**		**16**		**24**		**130**		**110**		**0.56**		**28**		**77**		**380**		**9.1**		**2.5**	
Pyrene	0.2	--	**0.11**		**0.036**		**0.034**		**0.86**		**0.81**		**43**		**25**		**0.41**		**4.2**		**21**		**190**		**6.1**		**1.8**	
VOC (ug/L)																												
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	U
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	**5.6**	**J**	**6.1**	**J**	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	0.5	U	**0.69**		**0.65**		**0.33**	**J**	**1.5**		0.5	U	**1.8**		0.5	U	**0.15**	**J**	**7.8**		**170**		**3.7**		**1.6**	
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon disulfide	1000	0.92	0.5	U	**0.27**	**J**	**0.22**	**J**	**0.22**	**J**	**0.37**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.17**	**J**	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.26**	**J**	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B5		GS-B5		GS-B5		GS-B5		GS-B5		GS-B6		GS-B6		GS-B6		GS-B7		GS-B7		GS-B7		GS-B7		GS-B7	
Sample ID			GS-B5-W-25		GS-B5-W-50		GS-B5-W-50 Dup		GS-B5-W-75		GS-B5-W-98.5		GS-B6-A		GS-B6-B		GS-B6-C		GS-B7-A		GS-B7-B		GS-B7-C		GS-B7-W-25		GS-B7-W-50	
Sample Date			9/14/2007		9/14/2007		9/14/2007		9/14/2007		9/14/2007		7/6/2007		7/6/2007		7/6/2007		7/5/2007		7/5/2007		7/5/2007		8/28/2007		8/29/2007	
Depth Below Mudline			23 to 27		48 to 52		48 to 52		73 to 77		94.5 to 98.5		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52	
Sample Elevation			-43.1 to -47.1		-68.1 to -72.1		-68.1to -72.1		-93.1 to -97.1		-114.6 to -118.6		-32.9 to -33.9		-36.9 to -38.9		-44.9 to -46.9		-31.1 to -32.1		-35.1 to -37.1		-43.1 to -45.1		-51.9 to -55.9		-76.9 to -80.9	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	0.5	U	0.5	U	0.5	U	**0.15**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.18**	**J**
cis-1,2-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	**0.14**	**J**	**1.5**		**1.4**		**1.9**		**5.7**		0.5	U	**1**		0.5	U	0.5	U	**0.69**		**16**		**0.95**		**0.34**	**J**
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	UJ	2	UJ
Iodomethane	--	--	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Isopropylbenzene	660	--	2	U	**0.33**	**J**	**0.32**	**J**	**0.34**	**J**	**1.2**	**J**	**0.76**	**J**	**1.3**	**J**	2	U	**2**	**J**	**1.7**	**J**	**1.6**	**J**	**0.18**	**J**	**0.35**	**J**
m,p-Xylenes	--	1.8	0.5	U	**0.6**		**0.59**		**0.52**		**1.3**		0.5	U	**0.55**		0.5	U	**0.32**	**J**	**0.49**	**J**	**17**		**1.6**		**2.1**	
Methyltert-butylether	37	--	0.5	U	0.5	U	0.5	U	0.5	U	**0.22**	**J**	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	0.2	12	**25**		**100**		**120**		**170**		**350**		**6.6**		**22**		**0.57**	**J**	**0.44**	**J**	**54**		**750**		**64**		**14**	
o-Xylene	1400	13	0.5	U	**0.81**		**0.77**		**0.61**		**1.7**		**0.15**	**J**	**0.99**		0.5	U	**0.55**		**0.47**	**J**	**9.4**		**0.76**		**1.5**	
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**4.3**		**7.4**		**7.4**		**4.5**		**7.8**		**0.12**	**J**	**0.14**	**J**	0.5	U	**0.16**	**J**	**0.57**		**32**		**59**		**110**	
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	U	10	U
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B7		GS-B7		GS-B7		GS-B8		GS-B8		GS-B8		GS-B9		GS-B9		GS-B9		GS-C1		GS-C1		GS-C1		GS-C2	
Sample ID			GS-B7-W-75		GS-B7-W-100		GS-B7-W-125		GS-B8-A		GS-B8-B		GS-B8-C		GS-B9-A		GS-B9-B		GS-B9-C		GS-C1-A		GS-C1-B		GS-C1-C		GS-C2-A	
Sample Date			8/29/2007		8/29/2007		8/29/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/16/2007		7/16/2007		7/16/2007		7/16/2007	
Depth Below Mudline			73 to 77		98 to 102		123 to 127		1 to 2		5 to 7		13 to 15		1.5 to 2.5		5 to 7		14.9 to 16.9		1.7 to 2.7		5.7 to 7.7		13.7 to 15.7		2.4 to 3.4	
Sample Elevation			-101.9 to -105.9		-126.9 to -130.9		-151.9 to -155.9		-30.1 to - 31.1		-34.1 to -36.1		-42.1 to -44.1		-31.1 to -32.1		-34.6 to -36.6		-44.5 to -46.5		-50.4 to -51.4		-54.4 to -56.4		-62.4 to -64.4		-43.4 to -44.4	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																												
Ammonia	--	--	**5.22**		**3.17**		**0.27**		**7.42**		**8.94**		**6.18**		**1.79**		**9.17**		**14.5**		**5.97**		**4.43**		**10.5**		**0.43**	
Amenable cyanide	--	--	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.07**		0.01	U	0.01	U	0.01	U	0.01	U	**0.06**		**0.01**		**0.01**	
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total Cyanide	0.14	0.0052	**0.02**		**0.04**		0.01	U	**0.02**		**0.11**		**0.55**		**0.03**		**0.04**		**0.25**		**0.2**		**0.06**		**0.39**		**0.03**	
Metals, Dissolved (mg/L)																												
Aluminum	0.05-0.2	0.087	**0.004**		**0.003**		**0.0034**																					
Antimony	0.006	0.03	**0.00209**		**0.00112**		**0.00314**																					
Arsenic	0.000014	0.0031	**0.00552**		**0.00073**		**0.00035**	**J**																				
Barium	--	--	**0.0645**		**0.0324**		**0.00938**																					
Beryllium	--	--	0.000003	U	0.000003	U	0.000003	U																				
Cadmium	0.005	0.000094	**0.000011**	**J**	**0.000011**	**J**	**0.000054**																					
Calcium metal	--	--	**56.9**		**56.9**		**8.06**																					
Chromium	0.1	--	**0.00056**		**0.00041**		0.00025	U																				
Copper	1.3	0.0027	**0.0001**		**0.00012**		**0.00058**																					
Iron	--	--	**25.1**		**30.2**		**0.841**																					
Lead	0.015	0.00054	0.00002	U	0.00002	U	**0.000033**																					
Magnesium	--	--	**24.2**		**28.7**		**3.14**																					
Manganese	0.01	0.12	**1.89**		**2.94**		**0.198**																					
Mercury	0.002	0.00077	0.00003	U	0.00003	U	0.00003	U																				
Nickel	0.46	0.016	**0.00708**		**0.00508**		**0.00407**																					
Potassium	--	--	**4.94**		**2.03**		**1.51**	**J**																				
Selenium	0.42	0.005	0.0002	UJ	0.0002	UJ	0.0002	UJ																				
Silver	0.1	0.00036	0.000003	U	0.000003	U	0.000003	U																				
Sodium	--	--	**12.4**		**17.2**		**10.1**																					
Thallium	--	--	0.000003	U	0.000003	U	0.000003	U																				
Zinc	26	0.036	**0.0216**		**0.0175**		**0.00459**																					
Metals, Total (mg/L)																												
Aluminum	0.05-0.2	--	**25.4**		**7.55**		**5.09**		**197**		**1780**		**34.8**		**310**		**13.4**		**189**		**448**		**45.8**		**0.52**		**195**	
Antimony	0.006	0.03	**0.00186**		**0.00295**		**0.0046**		0.00033	U	0.00039	U	0.0001	U	0.00032	U	0.00018	U	0.0001	U	**0.00034**		**0.00067**		**0.00009**		**0.00026**	
Arsenic	0.000014	0.0031	**0.00899**		**0.00313**		**0.00135**		**0.014**		**0.0757**		**0.00705**		**0.029**		**0.00268**		**0.0219**		**0.0392**		**0.0167**		**0.00751**		**0.0154**	
Barium	--	--	**0.412**		**0.122**		**0.0513**		**1.05**		**9.93**		**0.26**		**1.84**		**0.113**		**1.18**		**2.32**		**0.468**		**0.135**		**1.08**	
Beryllium	--	--	**0.0017**		**0.000478**		**0.000167**		**0.00291**		**0.0214**		**0.000722**		**0.00671**		**0.000319**		**0.00356**		**0.01**		**0.00107**		**0.000018**		**0.00478**	
Cadmium	0.005	0.00038	**0.00035**		**0.000142**		**0.000076**		**0.00176**		**0.0238**		**0.00016**		**0.00353**		**0.000238**		**0.00234**		**0.00272**		**0.000321**		**0.000055**		**0.00158**	
Calcium metal	--	--	**79.1**		**60.9**		**10.7**		**54.1**		**438**		**84.9**		**83.7**		**15.6**		**121**		**326**		**259**		**103**		**155**	
Chromium	0.1	--	**0.275**		**0.253**		**0.209**		**0.489**		**2.61**		**0.0505**		**0.537**		**0.0996**		**0.35**		**0.334**	**J**	**0.0601**	**J**	**0.00256**	**J**	**0.186**	**J**
Copper	1.3	0.0036	**0.127**		**0.0607**		**0.0416**		**0.418**		**3.42**		**0.0479**		**0.555**		**0.0278**		**0.336**		**0.482**		**0.0587**		**0.00114**		**0.185**	
Iron	--	--	**127**		**75.9**		**32**		**267**		**2420**		**122**		**421**		**21**		**308**		**658**		**199**		**63.2**		**286**	
Lead	0.015	0.00054	**0.0233**		**0.0111**		**0.00467**		**0.125**		**1.76**		**0.00701**		**0.321**		**0.0221**		**0.18**		**0.258**	**J**	**0.0293**	**J**	**0.000376**	**J**	**0.174**	**J**
Magnesium	--	--	**42.9**		**32.3**		**4.72**		**42.8**		**367**		**42.1**		**71.3**		**6.56**		**69.7**		**171**		**94.3**		**31.9**		**53.7**	
Manganese	0.01	0.12	**3.16**		**3.39**		**0.399**		**4.99**		**44.7**		**5.36**		**8.14**		**0.524**		**7.84**		**24.4**		**9.41**		**4.54**		**2.97**	
Mercury	0.0000146	0.000012	**0.00011**	**J**	**0.00003**		0.00003	U	**0.00046**		**0.00506**		0.0002	U	**0.00086**		0.0002	U	**0.00154**		**0.00101**		**0.00011**		0.0002	U	**0.00056**	
Nickel	0.46	0.049	**0.0802**		**0.0367**		**0.0222**		**0.0897**		**0.6**		**0.0453**		**0.194**		**0.0146**		**0.116**		**0.288**		**0.0574**		**0.00733**		**0.176**	
Potassium	--	--	**7.22**		**3.98**		**1.74**		**9.59**		**53.6**		**3.89**		**11.4**		**1.55**		**9.54**		**20.5**		**7.89**		**7.19**		**19.1**	
Selenium	0.42	0.035	0.002	UJ	0.0004	UJ	0.0002	UJ	0.0004	U	0.001	U	0.002	U	0.001	U	0.0002	U	0.002	U	**0.004**		**0.0052**		0.001	U	**0.0029**	
Silver	0.1	0.00012	**0.000329**		0.00012	U	0.000051	U	**0.002**		**0.0137**		**0.000159**		**0.00297**		**0.00029**		**0.00276**		**0.00192**	**J**	**0.00022**	**J**	**0.000092**	**J**	**0.00096**	**J**
Sodium	--	--	**15.5**		**18**		**10.8**		**14.3**		**55.1**		**17.7**		**16.9**		**9.53**		**18.9**		**38.4**		**26.9**		**85.3**		**76.2**	
Thallium	--	--	**0.000182**	**J**	**0.000063**		**0.000026**		**0.000432**		**0.00308**		**0.000086**		**0.000949**		**0.000048**		**0.000456**		**0.00133**		**0.000139**		**0.00001**		**0.000554**	
Zinc	26	0.033	**0.404**		**0.222**		**0.122**		**1.24**		**10.4**		**0.158**		**1.52**		**0.194**		**0.95**		**1.55**		**0.335**		**0.021**		**0.935**	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B7		GS-B7		GS-B7		GS-B8		GS-B8		GS-B8		GS-B9		GS-B9		GS-B9		GS-C1		GS-C1		GS-C1		GS-C2	
Sample ID			GS-B7-W-75		GS-B7-W-100		GS-B7-W-125		GS-B8-A		GS-B8-B		GS-B8-C		GS-B9-A		GS-B9-B		GS-B9-C		GS-C1-A		GS-C1-B		GS-C1-C		GS-C2-A	
Sample Date			8/29/2007		8/29/2007		8/29/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/16/2007		7/16/2007		7/16/2007		7/16/2007	
Depth Below Mudline			73 to 77		98 to 102		123 to 127		1 to 2		5 to 7		13 to 15		1.5 to 2.5		5 to 7		14.9 to 16.9		1.7 to 2.7		5.7 to 7.7		13.7 to 15.7		2.4 to 3.4	
Sample Elevation			-101.9 to -105.9		-126.9 to -130.9		-151.9 to -155.9		-30.1 to - 31.1		-34.1 to -36.1		-42.1 to -44.1		-31.1 to -32.1		-34.6 to -36.6		-44.5 to -46.5		-50.4 to -51.4		-54.4 to -56.4		-62.4 to -64.4		-43.4 to -44.4	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																												
2-Methylnaphthalene	0.2	2.1	**0.83**		**0.77**		**0.44**		**0.085**		**0.42**		**0.072**		**0.072**		**41**		**0.46**		**0.65**		**22**		**6.2**		**250**	
Acenaphthene	0.2	520	**0.94**		**0.95**		**0.52**		**0.76**		**13**		**1.4**		**3.3**		**68**		**5.2**		**9.2**		**77**		**270**		**510**	
Acenaphthylene	0.2	--	**0.79**		**0.95**		**0.46**		**0.19**		**0.73**		**0.033**		**0.071**		**4.3**		**0.85**		**0.17**		**1.2**		**0.81**		**12**	
Anthracene	0.2	0.73	**0.64**		**0.92**		**0.29**		**0.18**		**1.6**		**0.074**		**0.25**		**39**		**1**		**0.47**		**4.3**		**12**		**94**	
Benzo(a)anthracene	0.0018	0.027	**1.1**		**1.9**		**0.48**		**0.63**		**2.7**		**0.16**		**0.35**		**23**		**2.9**		**0.47**		**1.8**		**0.65**		**52**	
Benzo(a)pyrene	0.0018	0.014	**1.6**		**2.9**		**0.74**		**0.81**		**2.6**		**0.21**		**0.26**		**22**		**5.2**		**0.5**		**1.7**		**0.14**		**56**	
Benzo(b)fluoranthene	0.0018	--	**1.4**		**2.4**		**0.62**		**0.7**		**2.2**		**0.19**		**0.27**		**18**		**4.1**		**0.45**		**1.5**		**0.15**		**43**	
Benzo(g,h,i)perylene	0.2	--	**1.6**		**2.7**		**0.68**		**0.87**		**2.3**		**0.24**		**0.31**		**17**		**6.1**		**0.47**		**1.7**		**0.066**		**46**	
Benzo(k)fluoranthene	0.0018	--	**0.44**		**0.81**		**0.21**		**0.23**		**0.94**		**0.068**		**0.1**		**6**		**1.4**		**0.16**		**0.69**		**0.048**		**15**	
Chrysene	0.0018	--	**1.3**		**2.2**		**0.54**		**0.79**		**3.8**		**0.21**		**0.45**		**28**		**3.8**		**0.63**		**2.3**		**0.61**		**67**	
Dibenzo(a,h)anthracene	0.0018	--	**0.2**		**0.33**		**0.081**		**0.16**		**0.43**		**0.022**		**0.13**		**2.6**		**0.55**		**0.056**		**0.25**		**0.0077**	**J**	**5.4**	
Dibenzofuran	12	3.7	**0.11**		**0.11**		**0.058**		**0.07**		**1.7**		**0.0087**	**J**	**0.08**		**5.7**		**0.27**		**0.36**		**5.5**		**16**		**30**	
Fluoranthene	0.2	--	**3.5**		**5.4**		**1.7**		**2**		**12**		**0.66**		**2**		**49**		**12**		**2.7**		**11**		**19**		**230**	
Fluorene	0.2	3.9	**0.6**		**0.65**		**0.33**		**0.37**		**5.8**		**0.26**		**1.7**		**34**		**1.2**		**2.2**		**17**		**70**		**140**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**1.6**		**2.7**		**0.7**		**0.89**		**2.4**		**0.22**		**0.29**		**18**		**5.6**		**0.45**		**1.6**		**0.07**		**49**	
Naphthalene	0.2	12	**9.6**		**7.1**		**5.8**		**0.4**		**2.1**		**0.11**		**0.21**		**26**		**2.6**		**0.96**		**290**		**6.2**		**44**	
Phenanthrene	0.2	--	**3.5**		**4.4**		**1.8**		**1.7**		**19**		**1.4**		**4.8**		**110**		**11**		**5.6**		**36**		**140**		**490**	
Pyrene	0.2	--	**3.9**		**5.8**		**1.5**		**2**		**11**		**0.82**		**2**		**49**		**13**		**2.5**		**11**		**18**		**230**	
VOC (ug/L)																												
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.33**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.16**	**J**	**1.5**		0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.22**	**J**	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.15**	**J**	**1.7**		0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	U	5	U	5	U	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	20	UJ	**5.4**	**J**	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	**0.98**		**1.1**		**1.7**		**1.1**		**0.24**	**J**	**0.27**	**J**	0.5	U	**0.54**		0.5	U	**0.42**	**J**	**11**		**3.6**		**1.6**	
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon disulfide	1000	0.92	**0.22**	**J**	**0.18**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**1.4**		**14**		0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-B7		GS-B7		GS-B7		GS-B8		GS-B8		GS-B8		GS-B9		GS-B9		GS-B9		GS-C1		GS-C1		GS-C1		GS-C2	
Sample ID			GS-B7-W-75		GS-B7-W-100		GS-B7-W-125		GS-B8-A		GS-B8-B		GS-B8-C		GS-B9-A		GS-B9-B		GS-B9-C		GS-C1-A		GS-C1-B		GS-C1-C		GS-C2-A	
Sample Date			8/29/2007		8/29/2007		8/29/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/9/2007		7/16/2007		7/16/2007		7/16/2007		7/16/2007	
Depth Below Mudline			73 to 77		98 to 102		123 to 127		1 to 2		5 to 7		13 to 15		1.5 to 2.5		5 to 7		14.9 to 16.9		1.7 to 2.7		5.7 to 7.7		13.7 to 15.7		2.4 to 3.4	
Sample Elevation			-101.9 to -105.9		-126.9 to -130.9		-151.9 to -155.9		-30.1 to - 31.1		-34.1 to -36.1		-42.1 to -44.1		-31.1 to -32.1		-34.6 to -36.6		-44.5 to -46.5		-50.4 to -51.4		-54.4 to -56.4		-62.4 to -64.4		-43.4 to -44.4	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	0.5	U	**0.16**	**J**	0.5	U	**0.26**	**J**	0.5	U	**0.22**	**J**	**0.2**	**J**	0.5	U	**0.17**	**J**	**0.45**	**J**	**0.18**	**J**	**0.38**	**J**	**1.1**	
cis-1,2-Dichloroethene	--	--	0.5	U	**0.21**	**J**	0.5	U	0.5	U	0.5	U	**11**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	**0.31**	**J**	**0.25**	**J**	**0.39**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	**1.7**		0.5	U	0.5	U	**5.5**		**1.4**		**9.1**	
Hexachlorobutadiene	0.86	9.3	2	UJ	2	UJ	2	UJ	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	--	--	5	U	5	U	5	U	5	U	5	U	5	U	**2.7**	**J**	5	U	**2.7**	**J**	5	U	5	U	5	U	5	U
Isopropylbenzene	660	--	2	U	2	U	2	U	2	U	**0.11**	**J**	2	U	2	U	**1.2**	**J**	2	U	**0.39**	**J**	**4.5**		**29**		**4.1**	
m,p-Xylenes	--	1.8	**1.3**		**0.4**	**J**	**0.57**		0.5	U	0.5	U	0.5	U	0.5	U	**0.33**	**J**	0.5	U	**0.44**	**J**	**1.7**		**0.94**		**0.66**	
Methyltert-butylether	37	--	0.5	U	**0.84**		0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	0.2	12	**12**		**9.7**		**8.5**		**1.7**	**J**	2	U	2	U	2	U	**25**		2	U	2	U	**430**		**8.6**		**35**	
o-Xylene	1400	13	**1.2**		**0.18**	**J**	**0.27**	**J**	0.5	U	**0.11**	**J**	0.5	U	0.5	U	**0.64**		0.5	U	**0.32**	**J**	**6**		**4.6**		**3.1**	
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**110**		**170**		**520**		**130**		**26**		**1.9**		**1.5**		**50**		**2.4**		**6.6**		**20**		**1.5**		**1.1**	
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	UJ	10	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	U	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	**0.05**	**J**	0.5	U	0.5	U	0.5	U	**4.9**		0.5	U	0.5	U	**0.29**	**J**	**0.11**	**J**	**0.17**	**J**	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C3		GS-C3		GS-C3		GS-C4		GS-C4	
Sample ID			GS-C2-B		GS-C2-C		GS-C2-C Dup		GS-C2-W-25		GS-C2-W-50		GS-C2-W-75		GS-C2-W-100		GS-C2-W-119		GS-C3-A		GS-C3-B		GS-C3-C		GS-C4-A		GS-C4-B	
Sample Date			7/16/2007		7/16/2007		7/16/2007		9/13/2007		9/13/2007		9/13/2007		9/13/2007		9/13/2007		7/13/2007		7/13/2007		7/13/2007		7/13/2007		7/13/2007	
Depth Below Mudline			5.4 to 7.4		13.4 to 15.4		13.4 to 15.4		23 to 27		48 to 52		73 to 77		98 to 102		115 to 119		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7	
Sample Elevation			-46.4 to -48.4		-54.4 to -56.4		-54.4 to -56.4		-64.2 to -68.2		-46.4 to -93.2		-114.2 to -118.2		-139.2 to -143.2		-156.2 to -160.2		-45.0 to -46.0		-49.0 to -51.0		-57.0 to -59.0		-44.5 to -45.5		-48.5 to -50.5	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																												
Ammonia	--	--	0.31		0.29		0.33		0.31		0.86		0.83		0.51		0.46		0.08		0.67		0.08		0.07		0.05	
Amenable cyanide	--	--	0.01		0.04		0.04		0.01	UJ	0.05	J	0.01	UJ	0.02	J	0.01	UJ	0.01		0.01	U	0.02		0.03		0.01	
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.024		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total Cyanide	0.14	0.0052	0.01		0.04		0.04		0.01		0.27		0.46		0.49		0.04		0.01		0.02		0.03		0.06		0.02	
Metals, Dissolved (mg/L)																												
Aluminum	0.05-0.2	0.087							0.009		0.071		0.0043		0.0376		0.0072											
Antimony	0.006	0.03							0.00363		0.00083		0.003		0.00208		0.00551											
Arsenic	0.000014	0.0031							0.00035	J	0.00505		0.00146		0.00087		0.00048	J										
Barium	--	--							0.00965		0.111		0.138		0.148		0.0177											
Beryllium	--	--							0.000003	U	0.000003	U	0.000003	U	0.000003	U	0.000003	U										
Cadmium	0.005	0.000094							0.000008	U	0.000008	U	0.000008	U	0.000008	U	0.000008	U										
Calcium metal	--	--							15.4		185		201		307		22.7											
Chromium	0.1	--							0.00046		0.00044		0.00028		0.00058		0.00016	J										
Copper	1.3	0.0027							0.00067		0.00033		0.00033		0.00043		0.00011											
Iron	--	--							0.836		6.67		9.3		12.5		1.15											
Lead	0.015	0.00054							0.00007		0.000036		0.000033	U	0.000066		0.000024	U										
Magnesium	--	--							3.13		21		23.9		38.8		4.06											
Manganese	0.01	0.12							0.117		0.563		0.773		1.2		0.237											
Mercury	0.002	0.00077							0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U										
Nickel	0.46	0.016							0.00388		0.00308		0.00459		0.00506		0.0029											
Potassium	--	--							2	U	8.56		11		15.3		3.1	U										
Selenium	0.42	0.005							0.0002	U	0.0013		0.0008	J	0.0005	J	0.0002	U										
Silver	0.1	0.00036							0.000003	U	0.00002	U	0.000003	U	0.000003	U	0.000003	U										
Sodium	--	--							18.5		294		195		105		24.3											
Thallium	--	--							0.000003	U	0.000003	U	0.000003	U	0.000003	U	0.000003	U										
Zinc	26	0.036							0.00295		0.00252		0.00391		0.00558		0.00281											
Metals, Total (mg/L)																												
Aluminum	0.05-0.2	--	13		11.2		11.9		8.93	J	43.3	J	123	J	64.8	J	43.5	J	4.39		4.89		13.6		9.94		11.5	
Antimony	0.006	0.03	0.00009		0.00029		0.00031		0.00577		0.00047	U	0.00111	U	0.00108	U	0.00333		0.00008	J	0.00066	J	0.00025	J	0.00008	J	0.00004	J
Arsenic	0.000014	0.0031	0.0032		0.00473		0.00474		0.00164		0.00728		0.0104		0.00487		0.00363		0.00077		0.00146		0.00093		0.00228		0.00216	
Barium	--	--	0.131		0.102		0.105		0.059		0.309		0.73		0.439		0.284		0.08	J	0.09	J	0.123	J	0.116	J	0.101	J
Beryllium	--	--	0.000329		0.000252		0.000269		0.000204		0.0012		0.00303		0.00156		0.00107		0.000112		0.00012		0.000303		0.00022		0.000191	
Cadmium	0.005	0.00038	0.00006		0.000067		0.000073		0.000071		0.000125		0.000714		0.000358		0.000301		0.00004		0.000042		0.000031		0.000065		0.000043	
Calcium metal	--	--	109		71.8		72.8		18.8		198		238		331		40.9		82.5		70.6		87.4		105		108	
Chromium	0.1	--	0.012	J	0.0138	J	0.0141	J	0.0626		0.0445		0.239		0.146		0.284		0.0111		0.02		0.0236		0.0634		0.102	
Copper	1.3	0.0036	0.0115		0.014		0.0142		0.0381		0.047		0.214		0.102		0.221		0.00663	J	0.00858	J	0.0114	J	0.0117	J	0.00899	J
Iron	--	--	26		20.5		21.5		38.4		87.6		234		137		131		8.48		15.7		24.2		26.7		23.7	
Lead	0.015	0.00054	0.00378	J	0.00683	J	0.0039	J	0.00604		0.00951		0.0606		0.0246		0.0294		0.00564		0.0038		0.00265		0.00491		0.00159	
Magnesium	--	--	17.3		11.3		11.6		5.1		33.7		54.5		56.2		15.4		12.1		11.7		13.2		20.6		18.4	
Manganese	0.01	0.12	0.537		0.403		0.413		0.399		1.99		3.69		2.56		1.54		0.202		0.667		0.495		0.91		0.725	
Mercury	0.0000146	0.000012	0.00003	U	0.00003	U	0.00003	U	0.00004	J	0.00008	J	0.00029		0.00011	J	0.0001	J	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Nickel	0.46	0.049	0.0165		0.0145		0.015		0.0166		0.0352		0.113		0.0525		0.0536		0.00733		0.00779		0.0118		0.0152		0.0103	
Potassium	--	--	9.73		9.43		9.65		2.81	U	11.7		17.4		17.9		5.99		8.21		6.29		10.2		6.29		6.66	
Selenium	0.42	0.035	0.001	U	0.001	U	0.001	U	0.0002	U	0.0002	U	0.0004		0.0002		0.0003	J	0.0002	U	0.001	U	0.001	U	0.0002	U	0.0002	U
Silver	0.1	0.00012	0.000059	UJ	0.000032	UJ	0.000026	UJ	0.000088	U	0.000084	U	0.000686		0.000299		0.000231		0.000019		0.000041		0.000007		0.000036		0.000016	
Sodium	--	--	70.3		165		167		18.8		289		193		110		26.6		60.6		44.1		86		20.9		20.5	
Thallium	--	--	0.000036		0.000027		0.00003		0.000031	U	0.000081		0.000306		0.000122		0.000099		0.000021		0.000016		0.000033		0.000033		0.000041	
Zinc	26	0.033	0.064		0.111		0.105		0.0829		0.118		0.499		0.219		0.422		0.055		0.134		0.049		0.126		0.046	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C3		GS-C3		GS-C3		GS-C4		GS-C4	
Sample ID			GS-C2-B		GS-C2-C		GS-C2-C Dup		GS-C2-W-25		GS-C2-W-50		GS-C2-W-75		GS-C2-W-100		GS-C2-W-119		GS-C3-A		GS-C3-B		GS-C3-C		GS-C4-A		GS-C4-B	
Sample Date			7/16/2007		7/16/2007		7/16/2007		9/13/2007		9/13/2007		9/13/2007		9/13/2007		9/13/2007		7/13/2007		7/13/2007		7/13/2007		7/13/2007		7/13/2007	
Depth Below Mudline			5.4 to 7.4		13.4 to 15.4		13.4 to 15.4		23 to 27		48 to 52		73 to 77		98 to 102		115 to 119		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7	
Sample Elevation			-46.4 to -48.4		-54.4 to -56.4		-54.4 to -56.4		-64.2 to -68.2		-46.4 to -93.2		-114.2 to -118.2		-139.2 to -143.2		-156.2 to -160.2		-45.0 to -46.0		-49.0 to -51.0		-57.0 to -59.0		-44.5 to -45.5		-48.5 to -50.5	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																												
2-Methylnaphthalene	0.2	2.1	**0.63**		**2.8**		**3**		**5.3**		**18**		**55**		**40**		**19**		**0.49**		**2.2**		**0.015**	**J**	**27**		**0.011**	**J**
Acenaphthene	0.2	520	**16**		**3**		**3.2**		**6.3**		**23**		**92**		**73**		**27**		**52**		**120**		**0.25**		**43**		**0.014**	**J**
Acenaphthylene	0.2	--	**4.4**		**0.23**		**0.22**		**0.095**		**0.3**		**0.67**		**0.41**		**0.33**		**5.2**		**4.1**		**0.04**		**5.5**		**0.0039**	**J**
Anthracene	0.2	0.73	**7.4**		**1.1**		**1.1**		**0.046**		**0.037**		**1.1**		**4.3**		**0.12**		**12**		**19**		**0.17**		**30**		**0.0083**	**J**
Benzo(a)anthracene	0.0018	0.027	**17**		**1.1**		**1.1**		**0.068**		**0.011**	**J**	**0.063**		**0.021**	**J**	**0.13**		**25**		**17**		**0.18**		**22**		**0.0088**	**J**
Benzo(a)pyrene	0.0018	0.014	**21**		**1.3**		**1.2**		0.023	U	0.021	U	**0.0047**	**J**	**0.011**	**J**	0.023	U	**32**		**22**		**0.21**		**25**		**0.005**	**J**
Benzo(b)fluoranthene	0.0018	--	**17**		**0.99**		**0.97**		**0.099**		**0.042**		**0.061**		**0.012**	**J**	**0.25**		**25**		**18**		**0.18**		**20**		**0.0055**	**J**
Benzo(g,h,i)perylene	0.2	--	**19**		**1.1**		**1**		**0.069**		**0.0072**	**J**	**0.045**		**0.0093**	**J**	**0.18**		**27**		**19**		**0.21**		**24**		**0.0053**	**J**
Benzo(k)fluoranthene	0.0018	--	**5.7**		**0.33**		**0.32**		**0.026**		**0.012**	**J**	**0.016**	**J**	**0.0039**	**J**	**0.066**		**8.4**		**6**		**0.066**		**7.1**		0.019	U
Chrysene	0.0018	--	**23**		**1.6**		**1.6**		**0.13**		**0.086**		**0.06**		**0.02**	**J**	**0.22**		**32**		**26**		**0.29**		**45**		**0.015**	**J**
Dibenzo(a,h)anthracene	0.0018	--	**1.9**		**0.1**		**0.093**		**0.0066**	**J**	0.021	U	**0.0057**	**J**	0.021	U	**0.019**	**J**	**2.9**		**2.1**		**0.02**		**2.6**		0.019	U
Dibenzofuran	12	3.7	**0.58**		**0.25**		**0.25**		**0.36**		**1.6**		**4.3**		**3.1**		**1.2**		**0.59**		**2**		**0.0056**	**J**	**3.1**		0.019	U
Fluoranthene	0.2	--	**31**		**3.4**		**3.1**		**1.1**		**2.4**		**0.76**		**2.4**		**0.92**		**70**		**73**		**0.74**		**79**		**0.028**	
Fluorene	0.2	3.9	**3.8**		**1**		**1**		**2**		**9.7**		**28**		**22**		**7**		**10**		**34**		**0.1**		**18**		**0.0052**	**J**
Indeno(1,2,3-cd)pyrene	0.0018	--	**19**		**1.1**		**1**		**0.065**		**0.021**		**0.044**		**0.0091**	**J**	**0.18**		**28**		**20**		**0.19**		**20**		**0.004**	**J**
Naphthalene	0.2	12	**3.7**		**15**		**15**		**29**		**100**		**270**		**230**		**160**		**3.2**		**6.8**		**0.098**		**300**		**0.12**	
Phenanthrene	0.2	--	**14**		**5**		**4.9**		**3.5**		**30**		**55**		**55**		**11**		**17**		**110**		**0.52**		**97**		**0.023**	
Pyrene	0.2	--	**88**		**4**		**3.5**		**1**		**1.5**		**0.51**		**1.6**		**0.98**		**100**		**76**		**0.81**		**86**		**0.028**	
VOC (ug/L)																												
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	20	UJ	20	UJ	**5**	**J**	20	UJ	20	UJ	20	UJ	**5.4**	**J**	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	0.5	U	0.5	U	0.5	U	**0.45**	**J**	0.5	U	**0.66**		**0.36**	**J**	**0.46**	**J**	0.5	U	0.5	U	0.5	U	**0.29**	**J**	0.5	U
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon disulfide	1000	0.92	**0.29**	**J**	0.5	U	0.5	U	**0.2**	**J**	**0.27**	**J**	**1.4**		**0.58**		**0.49**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C2		GS-C3		GS-C3		GS-C3		GS-C4		GS-C4	
Sample ID			GS-C2-B		GS-C2-C		GS-C2-C Dup		GS-C2-W-25		GS-C2-W-50		GS-C2-W-75		GS-C2-W-100		GS-C2-W-119		GS-C3-A		GS-C3-B		GS-C3-C		GS-C4-A		GS-C4-B	
Sample Date			7/16/2007		7/16/2007		7/16/2007		9/13/2007		9/13/2007		9/13/2007		9/13/2007		9/13/2007		7/13/2007		7/13/2007		7/13/2007		7/13/2007		7/13/2007	
Depth Below Mudline			5.4 to 7.4		13.4 to 15.4		13.4 to 15.4		23 to 27		48 to 52		73 to 77		98 to 102		115 to 119		1 to 2		5 to 7		13 to 15		1 to 2		5 to 7	
Sample Elevation			-46.4 to -48.4		-54.4 to -56.4		-54.4 to -56.4		-64.2 to -68.2		-46.4 to -93.2		-114.2 to -118.2		-139.2 to -143.2		-156.2 to -160.2		-45.0 to -46.0		-49.0 to -51.0		-57.0 to -59.0		-44.5 to -45.5		-48.5 to -50.5	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	0.5	U	0.5	U	**0.16**	**J**	**0.15**	**J**	**0.16**	**J**	**0.15**	**J**	**0.21**	**J**	**0.17**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	**0.99**	
cis-1,2-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	0.5	U	0.5	U	0.5	U	**1.2**		**1.9**		**4.9**		**3.5**		**2.9**		0.5	U	0.5	U	0.5	U	**3.5**		0.5	U
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	--	--	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Isopropylbenzene	660	--	2	U	**0.11**	**J**	**0.11**	**J**	**0.22**	**J**	**0.67**	**J**	**2.4**		**1.6**	**J**	**1.2**	**J**	2	U	**1.2**	**J**	2	U	**0.78**	**J**	2	U
m,p-Xylenes	--	1.8	0.5	U	0.5	U	0.5	U	**0.32**	**J**	**0.4**	**J**	**1.1**		**0.87**		**0.74**		0.5	U	**0.29**	**J**	**0.23**	**J**	**0.41**	**J**	0.5	U
Methyltert-butylether	37	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	0.2	12	2	U	**28**		**29**		**140**		**260**		**430**		**400**		**340**		2	U	2	U	2	U	**330**		2	U
o-Xylene	1400	13	0.5	U	0.5	U	0.5	U	**0.45**	**J**	**0.61**		**1.9**		**1.4**		**1.3**		0.5	U	**0.22**	**J**	**0.11**	**J**	**1.1**		0.5	U
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**4.3**		**10**		**11**		**8**		**4.6**		**25**		**10**		**11**		**8.6**		**4.3**		**5.4**		**0.44**	**J**	**0.31**	**J**
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C4		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C6		GS-C6		GS-C6		GS-C7		GS-C7	
Sample ID			GS-C4-C		GS-C5-A		GS-C5-B		GS-C5-C		GS-C5-W-25		GS-C5-W-50		GS-C5-W-75		GS-C5-W-94		GS-C6-A		GS-C6-B		GS-C6-C		GS-C7-A		GS-C7-B	
Sample Date			7/13/2007		7/12/2007		7/12/2007		7/12/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		7/12/2007		7/12/2007		7/12/2007		7/11/2007		7/11/2007	
Depth Below Mudline			13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52		73 to 77		90 to 94		1.1 to 2.1		5.3 to 7.3		13.3 to 15.3		1 to 2		5 to 7	
Sample Elevation			-56.5 to -58.5		-44.5 to -45.5		-48.5 to -50.5		-56.5 to -58.5		-64.5 to -68.5		-89.5 to -93.5		-114.5 to -118.5		-131.5 to -135.5		-44.1 to -45.1		-48.3 to -50.3		-56.3 to -58.3		-45.2 to -46.2		-49.2 to -51.2	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																												
Ammonia	--	--	0.05		7.51		0.36		0.15		0.22		0.28		0.16		0.24		0.72		0.44		0.4		1.49		1.56	
Amenable cyanide	--	--	0.01		0.01	U	0.06		0.03		0.01	J	0.04	J	0.01	UJ	0.01	UJ	0.05		0.02		0.03		0.02		0.02	
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total Cyanide	0.14	0.0052	0.01		0.19		0.21		0.12		0.12		0.12		0.11		0.1		0.18		0.15		0.15		0.35		0.41	
Metals, Dissolved (mg/L)																												
Aluminum	0.05-0.2	0.087									0.0033		0.0062		0.006		0.005											
Antimony	0.006	0.03									0.00327		0.0112		0.00421		0.00456											
Arsenic	0.000014	0.0031									0.00055		0.00083		0.00039	J	0.00125											
Barium	--	--									0.0481		0.052		0.039		0.041											
Beryllium	--	--									0.000003	U	0.000003	U	0.000003	U	0.000003	U										
Cadmium	0.005	0.000094									0.000008	U	0.00001	J	0.000008	U	0.000009	J										
Calcium metal	--	--									55.7		53.6		58.4		62.2											
Chromium	0.1	--									0.00038		0.00027		0.00049		0.00067											
Copper	1.3	0.0027									0.00015		0.00016		0.00013		0.00016											
Iron	--	--									13.9		10.7		8.89		6.66											
Lead	0.015	0.00054									0.00002	U	0.00002	U	0.00002	U	0.00002	U										
Magnesium	--	--									26.2		22.7		26.2		26											
Manganese	0.01	0.12									0.591		0.763		0.466		0.433											
Mercury	0.002	0.00077									0.00003	U	0.00003	U	0.00003	U	0.00003	U										
Nickel	0.46	0.016									0.00153		0.00327		0.00347		0.00458											
Potassium	--	--									5.6	U	5.55	U	6.01		4.99	U										
Selenium	0.42	0.005									0.0002	J	0.0002	J	0.0002	U	0.0002	U										
Silver	0.1	0.00036									0.000003	U	0.000003	U	0.000003	U	0.000003	U										
Sodium	--	--									23		22		23.6		22.7											
Thallium	--	--									0.000003	U	0.000003	U	0.000003	U	0.000003	U										
Zinc	26	0.036									0.00369		0.0082		0.00597		0.00691											
Metals, Total (mg/L)																												
Aluminum	0.05-0.2	--	12.9		14.2		17.8		23.7		46.8		52.2		26.3		30.1		0.756		5.5		5.05		4.96		9.71	
Antimony	0.006	0.03	0.00013	J	0.0001	J	0.00008	J	0.00021	J	0.00151		0.00171		0.0027		0.0024		0.00002	UJ	0.00096	J	0.00021	J	0.00005	J	0.00002	UJ
Arsenic	0.000014	0.0031	0.00161		0.0153		0.00336		0.00279		0.0129		0.00235	J	0.00203		0.00325		0.00153		0.00146		0.00117		0.00309		0.00318	
Barium	--	--	0.11	J	0.289		0.188		0.236		0.296		0.333		0.18		0.196		0.06		0.08		0.08		0.09		0.126	
Beryllium	--	--	0.000236		0.000465		0.000583		0.000591		0.00156		0.00147		0.000664		0.00076		0.00002	U	0.000116		0.000111		0.000141		0.00028	
Cadmium	0.005	0.00038	0.000038		0.00013		0.000078		0.000054		0.00028		0.000225		0.000124		0.000185		0.000008	U	0.000017		0.000018		0.000041		0.000028	
Calcium metal	--	--	95.4		124		76.4		65.2		76.5		78.9		68.5		73.8		67.9		76.5		74.4		81.2		89.8	
Chromium	0.1	--	0.151		0.165		0.0295		0.107		0.0371		0.0553		0.0454		0.0748		0.0456		0.112		0.0219		0.119		0.0389	
Copper	1.3	0.0036	0.0124	J	0.0231	J	0.0227	J	0.0164	J	0.0575		0.0669		0.036		0.0509		0.00101	J	0.00851	J	0.00863	J	0.0075	J	0.00742	J
Iron	--	--	31.8		101		58.3		65		96.7		104		52.8		60.5		22.5		30.3		30.8		32.2		48.3	
Lead	0.015	0.00054	0.00402		0.0145		0.00641		0.00436		0.00867		0.0124		0.00868		0.0136		0.000155		0.0016		0.00229		0.00329		0.00153	
Magnesium	--	--	18.4		47.1		39		36.5		44.5		44.8		33.8		34.2		35.3		35.9		36.1		25.6		38.4	
Manganese	0.01	0.12	0.563		6.93		1.63		1.15		1.18		1.56		0.898		0.962		1.35		1.05		1.07		2.31		3.25	
Mercury	0.0000146	0.000012	0.00003	U	0.00005		0.00003	U	0.00003	U	0.00003	U	0.00003	J	0.00003	U	0.00006	J	0.00003	U	0.00003	U	0.00003	U	0.00005		0.00003	U
Nickel	0.46	0.049	0.0148		0.0189	J	0.0192	J	0.018	J	0.04		0.0494		0.0243		0.0265		0.00238	J	0.00887	J	0.00873	J	0.00806	J	0.00996	J
Potassium	--	--	7.34		6.17		5		5.28		7.96		7.76		6.82		6.41		5.27		5.79		5.17		5.82		7.03	
Selenium	0.42	0.035	0.0002	U	0.0004	U	0.0004	U	0.0002	U	0.0003	J	0.0002	U	0.0004	J	0.0006	J	0.001	U	0.001	U	0.001	U	0.0002	U	0.0002	U
Silver	0.1	0.00012	0.000012		0.000081		0.000029		0.000016		0.0001	U	0.0001	U	0.000077	U	0.000155		0.000003	U	0.000004		0.000004		0.000046		0.000004	
Sodium	--	--	19.2		19.4		24.7		27.2		25.9		26		25.4		24.6		24.8		25.6		23.7		26.1		30.4	
Thallium	--	--	0.000028		0.000064		0.000074		0.000059		0.000124		0.000126		0.000066		0.000078		0.00004	U	0.00004	U	0.00004	U	0.00004	U	0.00004	U
Zinc	26	0.033	0.102		0.22		0.094		0.114		0.1		0.158		0.0924		0.128		0.0083		0.126		0.098		0.094		0.042	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C4		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C6		GS-C6		GS-C6		GS-C7		GS-C7	
Sample ID			GS-C4-C		GS-C5-A		GS-C5-B		GS-C5-C		GS-C5-W-25		GS-C5-W-50		GS-C5-W-75		GS-C5-W-94		GS-C6-A		GS-C6-B		GS-C6-C		GS-C7-A		GS-C7-B	
Sample Date			7/13/2007		7/12/2007		7/12/2007		7/12/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		7/12/2007		7/12/2007		7/12/2007		7/11/2007		7/11/2007	
Depth Below Mudline			13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52		73 to 77		90 to 94		1.1 to 2.1		5.3 to 7.3		13.3 to 15.3		1 to 2		5 to 7	
Sample Elevation			-56.5 to -58.5		-44.5 to -45.5		-48.5 to -50.5		-56.5 to -58.5		-64.5 to -68.5		-89.5 to -93.5		-114.5 to -118.5		-131.5 to -135.5		-44.1 to -45.1		-48.3 to -50.3		-56.3 to -58.3		-45.2 to -46.2		-49.2 to -51.2	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																												
2-Methylnaphthalene	0.2	2.1	**0.05**		**0.62**		**2.1**		**0.0044**	**J**	**0.023**		**0.12**		**0.086**		**0.12**		**0.003**	**J**	**0.0049**	**J**	**0.006**	**J**	**13**		**0.05**	
Acenaphthene	0.2	520	**0.14**		**46**		**40**		**0.066**		**0.047**		**0.3**		**0.58**		**0.95**		**8.1**		**0.14**		**0.093**		**31**		**36**	
Acenaphthylene	0.2	--	**0.052**		**0.6**		**0.32**		0.02	U	**0.0049**	**J**	**0.0049**	**J**	**0.011**	**J**	**0.016**	**J**	**0.024**		0.02	U	**0.0061**	**J**	**0.67**		**0.38**	
Anthracene	0.2	0.73	**0.22**		**21**		**0.77**		**0.022**		**0.0047**	**J**	**0.015**	**J**	**0.053**		**0.048**		**0.02**		**0.01**	**J**	**0.023**		**4.1**		**0.88**	
Benzo(a)anthracene	0.0018	0.027	**0.21**		**3.1**		**0.12**		**0.0092**	**J**	0.021	U	0.02	U	**0.013**	**J**	**0.0066**	**J**	**0.0047**	**J**	**0.014**	**J**	**0.034**		**2.7**		**0.0039**	**J**
Benzo(a)pyrene	0.0018	0.014	**0.23**		**1.7**		**0.093**		**0.0045**	**J**	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	**0.01**	**J**	**0.029**		**2.8**		0.02	U
Benzo(b)fluoranthene	0.0018	--	**0.21**		**1.8**		**0.092**		**0.0054**	**J**	0.021	U	0.02	U	**0.0072**	**J**	**0.0038**	**J**	0.02	U	**0.011**	**J**	**0.026**		**2.3**		0.02	U
Benzo(g,h,i)perylene	0.2	--	**0.23**		**1.3**		**0.09**		**0.0046**	**J**	0.021	U	0.02	U	**0.005**	**J**	0.02	U	0.02	U	**0.011**	**J**	**0.026**		**2.5**		0.02	U
Benzo(k)fluoranthene	0.0018	--	**0.07**		**0.8**		**0.031**		**0.0026**	**J**	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	**0.0041**	**J**	**0.0092**	**J**	**0.84**		0.02	U
Chrysene	0.0018	--	**0.48**		**4**		**0.16**		**0.012**	**J**	0.021	U	0.02	U	**0.011**	**J**	**0.0042**	**J**	0.02	U	**0.02**		**0.053**		**5.1**		0.02	U
Dibenzo(a,h)anthracene	0.0018	--	**0.02**	**J**	**0.26**		**0.01**	**J**	0.02	U	0.021	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	**0.0027**	**J**	**0.27**		0.02	U
Dibenzofuran	12	3.7	**0.0098**	**J**	**0.97**		**0.065**		0.02	U	0.021	U	**0.044**		**0.074**		**0.1**		0.02	U	0.02	U	0.02	U	**0.51**		**0.73**	
Fluoranthene	0.2	--	**0.7**		**18**		**0.67**		**0.032**		**0.011**	**J**	**0.048**		**0.15**		**0.043**		**0.0092**	**J**	**0.061**		**0.13**		**9**		**0.41**	
Fluorene	0.2	3.9	**0.056**		**14**		**8.5**		**0.018**	**J**	**0.019**	**J**	**0.11**		**0.25**		**0.35**		**0.4**		**0.024**		**0.025**		**9.7**		**9**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**0.21**		**1.5**		**0.084**		**0.0042**	**J**	0.021	U	0.02	U	**0.0045**	**J**	0.02	U	0.02	U	**0.0093**	**J**	**0.026**		**2.4**		0.02	U
Naphthalene	0.2	12	**0.68**		**1.4**		**3.9**		0.02	U	**0.16**		**0.64**		**0.22**		**0.57**		**0.036**		**0.023**		**0.039**		**65**		**0.27**	
Phenanthrene	0.2	--	**0.31**		**39**		**2.5**		**0.037**		**0.088**		**0.33**		**0.79**		**0.87**		**0.0087**	**J**	**0.074**		**0.06**		**16**		**9.3**	
Pyrene	0.2	--	**0.77**		**15**		**0.67**		**0.029**		**0.0077**	**J**	**0.034**		**0.14**		**0.03**		**0.0085**	**J**	**0.056**		**0.13**		**11**		**0.14**	
VOC (ug/L)																												
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**3.8**		**0.56**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.32**	**J**	**0.24**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	0.5	U	**0.22**	**J**	**0.22**	**J**	0.5	U	**0.26**	**J**	**0.27**	**J**	**0.49**	**J**	**0.61**		0.5	U	0.5	U	0.5	U	**0.34**	**J**	0.5	U
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U
Carbon disulfide	1000	0.92	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.19**	**J**	**0.24**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	**1.1**		**0.26**	**J**	0.5	U	0.5	U	0.5	U	**1.3**		**0.14**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C4		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C5		GS-C6		GS-C6		GS-C6		GS-C7		GS-C7	
Sample ID			GS-C4-C		GS-C5-A		GS-C5-B		GS-C5-C		GS-C5-W-25		GS-C5-W-50		GS-C5-W-75		GS-C5-W-94		GS-C6-A		GS-C6-B		GS-C6-C		GS-C7-A		GS-C7-B	
Sample Date			7/13/2007		7/12/2007		7/12/2007		7/12/2007		9/11/2007		9/11/2007		9/11/2007		9/11/2007		7/12/2007		7/12/2007		7/12/2007		7/11/2007		7/11/2007	
Depth Below Mudline			13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52		73 to 77		90 to 94		1.1 to 2.1		5.3 to 7.3		13.3 to 15.3		1 to 2		5 to 7	
Sample Elevation			-56.5 to -58.5		-44.5 to -45.5		-48.5 to -50.5		-56.5 to -58.5		-64.5 to -68.5		-89.5 to -93.5		-114.5 to -118.5		-131.5 to -135.5		-44.1 to -45.1		-48.3 to -50.3		-56.3 to -58.3		-45.2 to -46.2		-49.2 to -51.2	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	**0.99**		0.5	U	0.5	U	0.5	U	**0.18**	**J**	**0.21**	**J**	**0.19**	**J**	**0.17**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,2-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	**0.14**	**J**	**0.16**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	0.5	U	0.5	U	**3**		0.5	U	0.5	U	0.5	U	0.5	U	**0.14**	**J**	0.5	U	0.5	U	0.5	U	**0.52**		0.5	U
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	--	--	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Isopropylbenzene	660	--	2	U	**3.3**		**5.1**		2	U	2	U	2	U	2	U	2	U	**0.42**	**J**	2	U	2	U	**1.8**	**J**	**1.9**	**J**
m,p-Xylenes	--	1.8	0.5	U	**0.61**		**1**		0.5	U	0.5	U	0.5	U	**0.33**	**J**	**0.66**		0.5	U	0.5	U	0.5	U	**0.32**	**J**	0.5	U
Methyltert-butylether	37	--	0.5	U	0.5	U	0.5	U	**0.34**	**J**	**0.74**		**1.1**		**1.4**		**1.4**		0.5	U	**0.29**	**J**	**0.34**	**J**	0.5	U	0.5	U
Naphthalene	0.2	12	2	U	**1.3**	**J**	**5**		2	U	**2**		**1**		**0.39**		**0.79**		2	U	2	U	2	U	**85**		2	U
o-Xylene	1400	13	0.5	U	**1.4**		**6.3**		0.5	U	0.5	U	0.5	U	0.5	U	**0.16**	**J**	0.5	U	0.5	U	0.5	U	**0.42**	**J**	**0.39**	**J**
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**3.2**		**0.86**		**0.65**		**5.3**		**96**		**85**		**190**		**300**		**0.64**		**3.4**		**1.5**		**0.22**	**J**	**0.17**	**J**
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	**0.07**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.12**	**J**	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID			GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C8		GS-C8		GS-C8		GS-C9		GS-C9		GS-C9		GS-C9		GS-D1	
Sample ID	JSCS	JSCS	GS-C7-C		GS-C7-W-25		GS-C7-W-50		GS-C7-W-75		GS-C7-W-100		GS-C8-A		GS-C8-B		GS-C8-C		GS-C9-A		GS-C9-B		GS-C9-C		GS-C9-C Dup		GS-D1-A	
Sample Date	Human	Ecological	7/11/2007		8/31/2007		8/31/2007		9/4/2007		9/4/2007		7/11/2007		7/11/2007		7/11/2007		7/10/2007		7/10/2007		7/10/2007		7/10/2007		7/20/2007	
Depth Below Mudline	Health	(Lowest	13 to 15		23 to 27		48 to 52		73 to 77		98 to 102		1.2 to 2.2		5.2 to 7.2		13.2 to 15.2		1 to 2		5 to 7		13 to 15		13 to 15		1 to 2	
Sample Elevation	(Lowest	Criteria)	-57.2 to -59.2		-61.2 to -65.2		-86.2 to -90.2		-111.2 to -115.2		-136.2 to -140.2		-44.1 to -45.1		-48.1 to -50.1		-56.1 to -58.1		-41.4 to -42.4		-45.4 to -47.4		-53.4 to -55.4		-53.4 to -55.4		-43.4 to -44.4	
Sample Matrix	Criteria)		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																												
Ammonia	--	--	**1.39**		**0.26**		**1.2**		**1.86**		**1.11**		**3.54**		**0.94**		**2.24**		**2.11**		**2.88**		**1.99**		**1.99**		**0.07**	
Amenable cyanide	--	--	**0.11**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	**0.05**		**0.01**		0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Total Cyanide	0.14	0.0052	**0.41**		**0.02**		**0.04**		**0.03**		**0.008**	**J**	**0.26**		**0.51**		**0.06**		**0.02**		**0.008**	**J**	0.01	U	0.01	U	**0.04**	
Metals, Dissolved (mg/L)																												
Aluminum	0.05-0.2	0.087			**0.0034**		**0.0041**		**0.006**		**0.0067**																	
Antimony	0.006	0.03			**0.00238**		**0.00317**		**0.00252**	**J**	**0.00448**	**J**																
Arsenic	0.000014	0.0031			**0.00046**		**0.00187**		**0.00171**	**J**	**0.00035**	**J**																
Barium	--	--			**0.00958**		**0.0444**		**0.0499**		**0.0125**																	
Beryllium	--	--			0.000003	U	0.000003	U	0.000003	U	0.000003	U																
Cadmium	0.005	0.000094			**0.000015**	**J**	**0.000011**	**J**	**0.00001**	**J**	**0.000052**																	
Calcium metal	--	--			**10.4**		**55.9**		**50.9**		**10.8**																	
Chromium	0.1	--			**0.00038**		**0.00033**		**0.00041**		0.00032	U																
Copper	1.3	0.0027			**0.00124**		**0.00022**		**0.00013**		**0.00028**																	
Iron	--	--			**1.84**		**20.9**		**22.1**		**1.32**																	
Lead	0.015	0.00054			**0.000054**		**0.000048**		**0.000022**		**0.00007**																	
Magnesium	--	--			**3.55**		**27.8**		**24.7**		**4.06**																	
Manganese	0.01	0.12			**0.16**		**1.95**		**2.18**		**0.298**																	
Mercury	0.002	0.00077			0.00003	U	0.00003	U	0.00003	U	0.00003	U																
Nickel	0.46	0.016			**0.00356**		**0.00239**		**0.00523**		**0.0073**																	
Potassium	--	--			**1.98**		**3.96**		**4.67**		**2.34**																	
Selenium	0.42	0.005			0.0002	UJ	0.0002	UJ	0.0002	UJ	0.0002	UJ																
Silver	0.1	0.00036			0.000003	U	0.000003	U	0.000003	U	0.000003	U																
Sodium	--	--			**8.33**		**17.9**		**16.1**		**9.4**																	
Thallium	--	--			0.00002	U	0.000003	U	0.000003	U	0.000003	U																
Zinc	26	0.036			**0.00563**		**0.00688**		**0.0118**		**0.00595**																	
Metals, Total (mg/L)																												
Aluminum	0.05-0.2	--	**38.5**		**0.775**		**3.17**		**19**		**36**		**12**		**5.55**		**14.6**		**22.5**		**9.77**		**126**		**63.5**		**11.7**	
Antimony	0.006	0.03	**0.00012**	**J**	**0.00548**		**0.0047**		**0.0022**	**J**	**0.00336**	**J**	**0.00007**	**J**	**0.00007**	**J**	**0.00012**	**J**	0.00026	U	**0.00035**		0.0001	U	0.0001	U	**0.00003**	
Arsenic	0.000014	0.0031	**0.00274**		**0.00109**		**0.00205**		**0.00222**	**J**	**0.00337**	**J**	**0.00651**		**0.0068**		**0.0082**		**0.0278**		**0.0202**		**0.0292**		**0.0268**		**0.0221**	
Barium	--	--	**0.233**		**0.0186**		**0.0691**		**0.19**		**0.33**		**0.163**		**0.0999**		**0.154**		**0.193**		**0.0914**		**0.764**		**0.395**		**0.168**	
Beryllium	--	--	**0.000878**		**0.000027**		**0.000108**		**0.000598**		**0.00143**		**0.000321**		**0.000161**		**0.000419**		**0.000559**		**0.000222**		**0.00229**		**0.00109**		**0.000442**	
Cadmium	0.005	0.00038	**0.000104**		**0.000031**		**0.00003**		**0.000083**		**0.000253**		**0.000206**		**0.000018**		**0.000052**		**0.000243**		**0.000119**		**0.000578**		**0.00034**		**0.000224**	
Calcium metal	--	--	**91.9**		**11.2**		**57**		**60.9**		**33.5**		**82**		**93.6**		**88.7**		**22.7**		**17**		**102**		**78.7**		**122**	
Chromium	0.1	--	**0.104**		**0.0884**		**0.069**		**0.188**		**1.02**		**0.0144**		**0.0718**		**0.154**		**0.0542**		**0.0285**		**0.201**		**0.109**		**0.0255**	
Copper	1.3	0.0036	**0.0441**	**J**	**0.0181**		**0.0184**		**0.0541**		**0.27**		**0.0166**	**J**	**0.00623**	**J**	**0.0145**	**J**	**0.0475**		**0.0181**		**0.178**		**0.0844**		**0.0188**	
Iron	--	--	**96.4**		**11.6**		**32.9**		**83.3**		**206**		**61.3**		**49.1**		**52.7**		**39.6**		**21.9**		**255**		**125**		**35**	
Lead	0.015	0.00054	**0.0105**		**0.0011**		**0.00128**		**0.00469**		**0.0122**		**0.0157**		**0.00128**		**0.00651**		**0.014**		**0.00269**		**0.0215**		**0.0107**		**0.0139**	
Magnesium	--	--	**53.4**		**3.86**		**28.5**		**32.5**		**20.1**		**30.7**		**44**		**22.9**		**11.5**		**7.9**		**63.7**		**40**		**20**	
Manganese	0.01	0.12	**3.58**		**0.229**		**2.03**		**2.78**		**1.88**		**2.18**		**1.64**		**0.959**		**1.03**		**0.391**		**4.17**		**2**		**1.24**	
Mercury	0.0000146	0.000012	0.00003	U	0.00003	U	0.00003	U	**0.00003**	**J**	**0.00005**	**J**	**0.00009**		0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.0002	U	0.00003	U	0.00003	U
Nickel	0.46	0.049	**0.0412**	**J**	**0.01**		**0.0102**		**0.0351**		**0.128**		**0.0101**	**J**	**0.00685**	**J**	**0.0157**	**J**	**0.0226**		**0.0145**		**0.128**		**0.0673**		**0.0241**	
Potassium	--	--	**5.32**		**1.61**		**4.44**		**5.18**		**5.46**		**5.29**		**4.16**		**6.13**		**4.38**		**4.16**		**11.9**		**8.72**		**9.48**	
Selenium	0.42	0.035	0.0004	U	0.0002	UJ	0.0002	UJ	0.0002	UJ	0.001	UJ	0.0002	U	0.001	U	0.001	U	0.0004	U	0.001	U	0.0004	U	0.001	U	**0.0003**	
Silver	0.1	0.00012	**0.000029**		0.00004	U	0.00004	U	0.000058	U	**0.000241**		**0.00016**		**0.00001**		**0.000018**		**0.000368**		**0.000077**		**0.000278**		**0.000123**		**0.000124**	
Sodium	--	--	**19.1**		**8.51**		**18.1**		**18.3**		**14.6**		**17.3**		**18.6**		**20**		**136**		**153**		**331**		**324**		**34.5**	
Thallium	--	--	**0.000109**		0.00002	U	0.00002	U	**0.000059**		**0.000114**		**0.000053**		0.00004	U	**0.000048**		**0.000096**		**0.00003**		**0.000269**		**0.000139**		**0.000056**	
Zinc	26	0.033	**0.403**		**0.0596**		**0.0908**		**0.142**		**0.689**		**0.153**		**0.0313**		**0.0882**		**0.148**		**0.0956**		**0.512**		**0.258**		**0.085**	

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C8		GS-C8		GS-C8		GS-C9		GS-C9		GS-C9		GS-C9		GS-D1	
Sample ID			GS-C7-C		GS-C7-W-25		GS-C7-W-50		GS-C7-W-75		GS-C7-W-100		GS-C8-A		GS-C8-B		GS-C8-C		GS-C9-A		GS-C9-B		GS-C9-C		GS-C9-C Dup		GS-D1-A	
Sample Date			7/11/2007		8/31/2007		8/31/2007		9/4/2007		9/4/2007		7/11/2007		7/11/2007		7/11/2007		7/10/2007		7/10/2007		7/10/2007		7/10/2007		7/20/2007	
Depth Below Mudline			13 to 15		23 to 27		48 to 52		73 to 77		98 to 102		1.2 to 2.2		5.2 to 7.2		13.2 to 15.2		1 to 2		5 to 7		13 to 15		13 to 15		1 to 2	
Sample Elevation			-57.2 to -59.2		-61.2 to -65.2		-86.2 to -90.2		-111.2 to -115.2		-136.2 to -140.2		-44.1 to -45.1		-48.1 to -50.1		-56.1 to -58.1		-41.4 to -42.4		-45.4 to -47.4		-53.4 to -55.4		-53.4 to -55.4		-43.4 to -44.4	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																												
2-Methylnaphthalene	0.2	2.1	0.057		32		37		26		140		81		0.081		0.14		0.022		0.0057	J	0.02	U	0.0026	J	0.34	
Acenaphthene	0.2	520	6.4		22		30		25		120		130		0.33		0.32		15		0.07		0.019	J	0.02		1.8	
Acenaphthylene	0.2	--	0.11		0.51		0.99		1		1.5		3.3		0.025		0.027		0.11		0.0068	J	0.02	U	0.02	U	0.58	
Anthracene	0.2	0.73	0.025		3.6		7.1		6.7		15		25		0.063		0.11		0.41		0.033		0.0047	J	0.0069	J	1.3	
Benzo(a)anthracene	0.0018	0.027	0.011	J	1.8		4.2		3.9		5		12		0.058		0.098		0.094		0.027		0.009	J	0.0099	J	2.8	
Benzo(a)pyrene	0.0018	0.014	0.0048	J	2.3		5.5		4.1		4.8		12		0.049		0.087		0.12		0.018	J	0.02	U	0.0052	J	3.3	
Benzo(b)fluoranthene	0.0018	--	0.007	J	1.9		4.6		4.5		5.3		10		0.051		0.081		0.13		0.021		0.0071	J	0.0088	J	2.7	
Benzo(g,h,i)perylene	0.2	--	0.0042	J	1.9		4.5		3.3		3.7		7.4		0.046		0.076		0.12		0.02	J	0.0042	J	0.0053	J	2.9	
Benzo(k)fluoranthene	0.0018	--	0.02	U	0.66		1.5		1.2		1.4		3.4		0.02		0.039		0.049		0.0092	J	0.0042	J	0.0034	J	0.95	
Chrysene	0.0018	--	0.018	J	2.1		4.9		4.2		5.4		15		0.084		0.14		0.14		0.042		0.014	J	0.016	J	4.1	
Dibenzo(a,h)anthracene	0.0018	--	0.02	U	0.26		0.62		0.43		0.42		0.95		0.0055	J	0.0088	J	0.015	J	0.02	U	0.02	U	0.02	U	0.27	
Dibenzofuran	12	3.7	0.02	U	1.1		1.9		1.6		6.1		6.6		0.0077	J	0.014	J	0.033		0.02	U	0.02	U	0.02	U	0.057	
Fluoranthene	0.2	--	0.044		7.9		19		17		27		50		0.24		0.45		1.9		0.13		0.043		0.049		10	
Fluorene	0.2	3.9	1.1		5.6		10		9		30		41		0.053		0.097		8.7		0.045		0.011	J	0.012	J	1.3	
Indeno(1,2,3-cd)pyrene	0.0018	--	0.0041	J	2		4.7		3.3		3.6		8.3		0.044		0.072		0.12		0.018	J	0.0046	J	0.0044	J	2.8	
Naphthalene	0.2	12	0.053		390		200		220		930		7.9		0.028		0.042		0.088		0.039		0.0068	J	0.0066	J	0.77	
Phenanthrene	0.2	--	0.27		19		41		43		110		130		0.29		0.49		19		0.17		0.045		0.054		0.99	
Pyrene	0.2	--	0.04		8		18		17		28		53		0.24		0.43		1.1		0.1		0.028		0.037		11	
VOC (ug/L)																												
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	0.68	J	27		0.68		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	4	U	2	U	2	U	10	U	5	U	100	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	4	U	2	U	2	U	10	U	5	U	100	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.18	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	40	UJ	20	UJ	20	UJ	100	UJ	50	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	--	--	5	UJ	10	UJ	5	UJ	5	UJ	25	UJ	13	UJ	250	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	40	UJ	20	UJ	20	UJ	100	UJ	50	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	40	UJ	20	UJ	20	UJ	100	UJ	50	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	40	UJ	20	UJ	20	UJ	100	UJ	50	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	40	UJ	20	UJ	20	UJ	100	UJ	50	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	10	UJ	5	UJ	5	UJ	25	UJ	13	UJ	250	UJ	5	UJ	1.5	J	1.4	J	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	0.5	U	4.4		2		2.8		7.9		36		44		1.8		0.16	J	0.77		0.5	U	0.5	U	0.5	U
Bromochloromethane	--	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	8.7	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U
Carbon disulfide	1000	0.92	0.5	U	1	U	0.5	U	0.16	J	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C8		GS-C8		GS-C8		GS-C9		GS-C9		GS-C9		GS-C9		GS-D1	
Sample ID			GS-C7-C		GS-C7-W-25		GS-C7-W-50		GS-C7-W-75		GS-C7-W-100		GS-C8-A		GS-C8-B		GS-C8-C		GS-C9-A		GS-C9-B		GS-C9-C		GS-C9-C Dup		GS-D1-A	
Sample Date			7/11/2007		8/31/2007		8/31/2007		9/4/2007		9/4/2007		7/11/2007		7/11/2007		7/11/2007		7/10/2007		7/10/2007		7/10/2007		7/10/2007		7/20/2007	
Depth Below Mudline			13 to 15		23 to 27		48 to 52		73 to 77		98 to 102		1.2 to 2.2		5.2 to 7.2		13.2 to 15.2		1 to 2		5 to 7		13 to 15		13 to 15		1 to 2	
Sample Elevation			-57.2 to -59.2		-61.2 to -65.2		-86.2 to -90.2		-111.2 to -115.2		-136.2 to -140.2		-44.1 to -45.1		-48.1 to -50.1		-56.1 to -58.1		-41.4 to -42.4		-45.4 to -47.4		-53.4 to -55.4		-53.4 to -55.4		-43.4 to -44.4	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	0.5	U	**0.36**	**J**	0.5	U	0.5	U	**0.75**	**J**	1.3	U	25	U	0.5	U	0.5	U	**0.58**		0.5	U	0.5	U	**0.59**	
cis-1,2-Dichloroethene	--	--	0.5	U	1	U	0.5	U	**7.1**		**5.7**		**230**		**11000**		**240**		**0.41**	**J**	**0.57**		**0.16**	**J**	**0.16**	**J**	0.5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ
Dichloromethane	--	--	2	U	4	U	2	U	2	U	10	U	**0.63**	**J**	**14**	**J**	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	0.5	U	**8.1**		**3.7**		**4.3**		**8.9**		**13**		25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	0.86	9.3	2	U	4	U	2	U	2	U	10	U	5	U	100	U	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	--	--	5	U	10	U	5	U	5	U	25	U	13	U	250	U	5	U	5	U	5	U	5	U	5	U	5	UJ
Isopropylbenzene	660	--	**1.9**	**J**	**0.74**	**J**	**0.53**	**J**	**0.27**	**J**	**0.95**	**J**	**5**	**J**	100	U	2	U	2	U	2	U	2	U	2	U	2	U
m,p-Xylenes	--	1.8	**1.9**		**2.4**		**1.1**		**1.4**		**3.1**		**0.7**	**J**	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methyltert-butylether	37	--	0.5	U	1	U	**0.57**		**0.64**		2.5	U	1.3	U	25	U	**3**		**17**		**16**		**0.29**	**J**	**0.31**	**J**	0.5	U
Naphthalene	0.2	12	**0.71**	**J**	**480**		**320**		**300**		**1000**		**8**	**J**	100	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2	U
o-Xylene	1400	13	**4.1**		**2.6**		**1.2**		**1.4**		**2.9**		**2.7**		25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	100	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**0.48**	**J**	**110**		**120**		**82**		**480**		**6.6**		25	U	**0.74**		**23**		**5.7**		**2.7**		**2.7**		**0.25**	**J**
trans-1,2-Dichloroethene	100	590	0.5	U	1	U	0.5	U	0.5	U	2.5	U	**0.7**	**J**	**18**	**J**	**1**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	20	UJ	10	UJ	10	UJ	50	UJ	25	UJ	500	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	1	U	0.5	U	**4.8**		**2.4**	**J**	1.3	U	**7**	**J**	**1.3**		0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	1	U	0.5	U	0.5	U	2.5	U	1.3	U	25	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	10	UJ	5	UJ	5	UJ	25	UJ	13	UJ	250	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	1	U	0.5	U	**0.23**	**J**	**0.35**	**J**	**780**		**7600**		**91**		**0.05**	**J**	**0.08**	**J**	**0.22**	**J**	**0.24**	**J**	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-D1		GS-D1		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D3		GS-D3		GS-D3		GS-D4	
Sample ID			GS-D1-B		GS-D1-C		GS-D2-A		GS-D2-B		GS-D2-C		GS-D2-W-25		GS-D2-W-50		GS-D2-W-75		GS-D2-W-100		GS-D3-A		GS-D3-B		GS-D3-C		GS-D4-A	
Sample Date			7/20/2007		7/20/2007		7/20/2007		7/20/2007		7/20/2007		9/10/2007		9/10/2007		9/10/2007		9/10/2007		7/23/2007		7/23/2007		7/23/2007		7/23/2007	
Depth Below Mudline			5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52		73 to 77		98 to 102		0.5 to 1.5		4.5 to 6.5		12.5 to 14.5		1 to 2	
Sample Elevation			-47.4 to -49.4		-55.4 to -57.4		-46.2 to -47.2		-50.2 to -52.2		-58.2 to -60.2		-69.2 to -73.2		-94.2 to -98.2		-119.2 to -123.2		-144.2 to -148.2		-48.0 to -49.0		-52.0 to -54.0		-60.0 to -62.0		-49.0 to -50.0	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																												
Ammonia	--	--	**0.048**	J	**0.19**		**0.51**		**0.41**		**0.51**		**0.23**		**0.27**		**0.08**		**0.05**		**1.72**		**1.76**		**2.27**		**1.55**	
Amenable cyanide	--	--	0.01	U	0.01	U	0.01	U	0.01	U	**0.03**		0.01	UJ	0.01	UJ	**0.01**	J	**0.01**	J	0.01	U	0.01	U	0.01	U	0.01	U
Free Cyanide	0.014	0.0052	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	UJ	0.01	UJ	0.01	UJ	0.01	UJ
Total Cyanide	0.14	0.0052	**0.02**		**0.02**		**0.04**		**0.05**		**0.05**		**0.06**		**0.06**		**0.06**		**0.05**		**0.05**		**0.05**		**0.02**		**0.03**	
Metals, Dissolved (mg/L)																												
Aluminum	0.05-0.2	0.087											**0.0051**		**0.0056**		**0.0081**		**0.005**									
Antimony	0.006	0.03											**0.00098**		**0.00265**		**0.00245**		**0.00209**									
Arsenic	0.000014	0.0031											**0.00376**		**0.00028**	J	**0.00197**		**0.00076**									
Barium	--	--											**0.0662**		**0.0494**		**0.0428**		**0.0323**									
Beryllium	--	--											0.000003	U	0.000003	U	0.000003	U	0.000003	U								
Cadmium	0.005	0.000094											0.000008	U	0.000008	U	0.000008	U	**0.000012**	J								
Calcium metal	--	--											**83.1**		**71.2**		**73.1**		**64.7**									
Chromium	0.1	--											**0.00023**		**0.00056**		**0.00027**		**0.00022**									
Copper	1.3	0.0027											**0.0001**		**0.00013**		**0.00014**		**0.00013**									
Iron	--	--											**6.04**		**3.3**		**3.23**		**0.638**									
Lead	0.015	0.00054											**0.000059**		0.000028	U	**0.000039**		0.00002	U								
Magnesium	--	--											**12.8**		**13.1**		**11**		**8.61**									
Manganese	0.01	0.12											**0.836**		**0.577**		**0.355**		**0.621**									
Mercury	0.002	0.00077											0.00003	U	0.00003	U	0.00003	U	0.00003	U								
Nickel	0.46	0.016											**0.00157**		**0.00175**		**0.00347**		**0.00227**									
Potassium	--	--											**9.34**		**9.06**		**9.34**		**8.58**									
Selenium	0.42	0.005											0.0002	U	**0.0003**	J	**0.0003**	J	**0.0003**	J								
Silver	0.1	0.00036											0.000003	U	0.00002	U	0.000003	U	0.00002	U								
Sodium	--	--											**69.6**		**98.6**		**90.9**		**66.4**									
Thallium	--	--											0.000003	U	0.000003	U	0.000003	U	0.00002	U								
Zinc	26	0.036											**0.00404**		**0.00318**		**0.00597**		**0.00417**									
Metals, Total (mg/L)																												
Aluminum	0.05-0.2	--	**7.61**		**45.8**		**1.57**		**3.96**		**8.23**		**5.36**		**21.5**		**12.4**		**27.9**		**1.12**		**3.75**		**33.1**		**4.34**	
Antimony	0.006	0.03	**0.00006**		**0.00011**		0.00002	U	**0.00046**		**0.00044**		**0.00183**		**0.00157**		**0.00239**		**0.00074**		0.00008	U	**0.00027**		**0.002**		0.00006	U
Arsenic	0.000014	0.0031	**0.0115**		**0.00604**		**0.0185**		**0.0156**		**0.0145**		**0.00418**		**0.00204**		**0.00311**		**0.00234**		**0.0654**	J	**0.0584**	J	**0.0341**	J	**0.0455**	J
Barium	--	--	**0.102**		**0.402**		**0.07**		**0.076**		**0.097**		**0.0976**		**0.164**		**0.0942**		**0.179**		**0.112**	J	**0.118**	J	**0.263**	J	**0.105**	J
Beryllium	--	--	**0.000225**		**0.00184**		**0.000047**		**0.000123**		**0.000278**		**0.000126**		**0.000574**		**0.00026**		**0.000758**		**0.000049**		**0.000098**		**0.000786**		**0.00014**	
Cadmium	0.005	0.00038	**0.000028**		**0.000361**		0.000008	U	**0.000014**		**0.000049**		**0.000016**	J	**0.000082**		**0.000037**		**0.000145**		**0.000014**	J	**0.000026**		**0.000112**		**0.000016**	J
Calcium metal	--	--	**131**		**152**		**106**		**80.6**		**68**		**86.2**		**81.2**		**82.2**		**75.9**		**86.4**		**96.2**		**80.5**		**69**	
Chromium	0.1	--	**0.011**		**0.0453**		**0.00207**		**0.0122**		**0.0257**		**0.0125**		**0.0357**		**0.0254**		**0.0392**		**0.00268**		**0.0109**		**0.0913**		**0.00596**	
Copper	1.3	0.0036	**0.0117**		**0.0544**		**0.00216**		**0.00804**		**0.0151**		**0.00624**		**0.026**		**0.0179**		**0.0303**		**0.00257**		**0.0111**		**0.0506**		**0.00701**	
Iron	--	--	**22.2**		**105**		**12.4**		**17.8**		**29.9**		**15.8**		**42.3**		**22.2**		**58.5**		**31**		**40.8**		**99.6**		**28.7**	
Lead	0.015	0.00054	**0.00213**		**0.0108**		**0.000404**		**0.00183**		**0.00496**		**0.00107**		**0.00407**		**0.00243**		**0.00712**		**0.0046**	J	**0.00251**	J	**0.0135**	J	**0.00139**	J
Magnesium	--	--	**19.3**		**33.3**		**19.9**		**15.7**		**17.5**		**14**		**19**		**14.4**		**15.5**		**23.4**		**26.9**		**32.2**		**20.1**	
Manganese	0.01	0.12	**0.633**		**1.26**		**2.54**		**1.87**		**2.06**		**0.941**		**0.941**		**0.498**		**1.59**		**1.74**		**1.87**		**3.01**		**1.53**	
Mercury	0.0000146	0.000012	0.00003	U	0.00003	U	0.00015	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	**0.00005**	J	**0.00003**	J
Nickel	0.46	0.049	**0.0125**		**0.0509**		**0.00336**		**0.00965**		**0.0156**		**0.0086**		**0.0243**		**0.0171**		**0.0204**		**0.00479**		**0.014**		**0.0504**		**0.00765**	
Potassium	--	--	**8.38**		**10.2**		**5.65**		**4.69**		**4.65**		**9.75**		**10**		**10.3**		**11**		**8.36**		**8.33**		**6.84**		**7.09**	
Selenium	0.42	0.035	0.0002	U	0.0002	U	**0.0005**		0.0002	U	0.0002	U	**0.0005**	J	**0.0006**	J	**0.0004**	J	**0.0004**	J	**0.0002**	J	**0.0005**	J	0.0004	U	0.0002	U
Silver	0.1	0.00012	0.00002	U	**0.000051**		0.000003	U	0.00002	U	0.00002	U	0.00002	U	0.000033	U	0.00002	U	0.000054	U	0.000021	U	0.000003	U	0.000045	U	0.000003	U
Sodium	--	--	**28.8**		**29.7**		**60.9**		**65.3**		**52.3**		**71**		**100**		**95.5**		**69.6**		**136**		**157**		**144**		**140**	
Thallium	--	--	0.000025	U	**0.000134**		0.00002	U	0.00002	U	**0.000029**		0.00002	U	**0.000056**		0.000035	U	**0.0001**		0.000003	U	0.000025	U	0.000085	U	0.000022	U
Zinc	26	0.033	**0.112**		**0.511**		**0.011**		**0.093**		**0.138**		**0.0217**		**0.0761**		**0.0396**		**0.0791**		**0.0235**	J	**0.108**	J	**0.368**	J	**0.0374**	J

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-D1		GS-D1		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D3		GS-D3		GS-D3		GS-D4	
Sample ID			GS-D1-B		GS-D1-C		GS-D2-A		GS-D2-B		GS-D2-C		GS-D2-W-25		GS-D2-W-50		GS-D2-W-75		GS-D2-W-100		GS-D3-A		GS-D3-B		GS-D3-C		GS-D4-A	
Sample Date			7/20/2007		7/20/2007		7/20/2007		7/20/2007		7/20/2007		9/10/2007		9/10/2007		9/10/2007		9/10/2007		7/23/2007		7/23/2007		7/23/2007		7/23/2007	
Depth Below Mudline			5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52		73 to 77		98 to 102		0.5 to 1.5		4.5 to 6.5		12.5 to 14.5		1 to 2	
Sample Elevation			-47.4 to -49.4		-55.4 to -57.4		-46.2 to -47.2		-50.2 to -52.2		-58.2 to -60.2		-69.2 to -73.2		-94.2 to -98.2		-119.2 to -123.2		-144.2 to -148.2		-48.0 to -49.0		-52.0 to -54.0		-60.0 to -62.0		-49.0 to -50.0	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																												
2-Methylnaphthalene	0.2	2.1	**0.027**		**0.043**		**0.0031**	J	**0.0053**	J	**0.012**	J	**0.11**		**0.32**		**0.013**	J	**0.021**		0.019	U	**0.0055**	J	**0.024**		**0.042**	
Acenaphthene	0.2	520	**0.41**		**0.27**		**0.0054**	J	**0.018**	J	**0.021**		**0.76**		**0.26**		**0.073**		**0.15**		0.019	U	**0.013**	J	**0.024**		**2.1**	
Acenaphthylene	0.2	--	**0.25**		**0.11**		0.022	U	**0.0083**	J	**0.019**	J	**0.011**	J	**0.0093**	J	**0.0046**	J	**0.021**		0.019	U	**0.0038**	J	**0.013**	J	**0.029**	
Anthracene	0.2	0.73	**0.5**		**0.25**		**0.0049**	J	**0.027**		**0.03**		**0.18**		**0.0047**	J	**0.0047**	J	**0.049**		0.019	UJ	**0.0054**	J	**0.018**	J	**0.0057**	J
Benzo(a)anthracene	0.0018	0.027	**1.1**		**0.57**		0.022	U	**0.05**		**0.11**		**0.0062**	J	**0.0029**	J	**0.0028**	J	**0.093**		**0.0073**	J	**0.015**	J	**0.11**		**0.0094**	J
Benzo(a)pyrene	0.0018	0.014	**1.3**		**0.65**		**0.0058**	J	**0.043**		**0.11**		0.021	U	0.039	UJ	0.21	UJ	**0.068**		R		R		R		**0.0047**	J
Benzo(b)fluoranthene	0.0018	--	**1.1**		**0.56**		**0.0085**	J	**0.045**		**0.11**		**0.0032**	J	0.039	UJ	0.21	UJ	**0.089**		**0.0048**	J	**0.012**	J	**0.13**		**0.0065**	J
Benzo(g,h,i)perylene	0.2	--	**1.2**		**0.6**		0.022	U	**0.044**		**0.11**		0.021	U	0.039	UJ	0.21	UJ	**0.062**		**0.003**	J	**0.0086**	J	**0.13**		**0.0053**	J
Benzo(k)fluoranthene	0.0018	--	**0.39**		**0.2**		**0.0045**	J	**0.017**	J	**0.035**		0.021	U	0.039	UJ	0.21	UJ	**0.023**		0.019	U	**0.0041**	J	**0.083**		0.02	U
Chrysene	0.0018	--	**1.9**		**0.92**		**0.012**	J	**0.066**		**0.14**		0.021	U	0.02	U	0.021	U	**0.11**		**0.0083**	J	**0.017**	J	**0.15**		**0.009**	J
Dibenzo(a,h)anthracene	0.0018	--	**0.12**		**0.062**		**0.0037**	J	**0.0051**	J	**0.013**	J	0.021	U	0.039	UJ	0.21	UJ	**0.0073**	J	0.019	U	0.02	U	**0.074**		0.02	U
Dibenzofuran	12	3.7	**0.014**	J	**0.013**	J	0.022	U	0.02	U	0.02	U	**0.082**		**0.021**		**0.0095**	J	**0.0093**	J	0.019	U	0.02	U	0.021	U	0.02	U
Fluoranthene	0.2	--	**3.9**		**1.9**		**0.032**		**0.17**		**0.26**		**0.12**		**0.032**		**0.05**		**0.32**		**0.028**		**0.048**		**0.22**		**0.026**	
Fluorene	0.2	3.9	**0.27**		**0.15**		0.022	U	**0.013**	J	**0.014**	J	**0.51**		**0.11**		**0.072**		**0.083**		0.019	U	**0.0089**	J	**0.017**	J	**0.04**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**1.2**		**0.61**		**0.0091**	J	**0.043**		**0.098**		0.021	U	0.039	UJ	0.21	UJ	**0.054**		0.019	U	**0.0062**	J	**0.11**		**0.0035**	J
Naphthalene	0.2	12	**0.16**		**0.26**		**0.012**	J	**0.022**		**0.043**		**0.051**		**1.9**		**0.12**		**0.074**		0.019	U	0.02	U	**0.14**		**0.48**	
Phenanthrene	0.2	--	**0.33**		**0.42**		**0.028**		**0.12**		**0.13**		**1.9**		**0.24**		**0.1**		**0.23**		**0.014**	J	**0.039**		**0.12**		**0.021**	
Pyrene	0.2	--	**4**		**1.9**		**0.034**		**0.18**		**0.28**		**0.077**		**0.02**		**0.026**		**0.35**		**0.028**		**0.043**		**0.21**		**0.024**	
VOC (ug/L)																												
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	**1.5**		**3.2**		**2.7**		**4.5**		**0.64**		**0.4**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	**0.14**	J	**0.12**	J	**0.64**		0.5	U	**0.24**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	7100	14000	20	UJ	**3**	J	20	UJ	**3.7**	J	**4.9**	J	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	**34**	J	20	UJ
2-Chloroethylvinylether	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	5500	1500	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	1.2	130	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.22**	J	**0.22**	J	**0.47**	J	0.5	U	0.5	U	0.5	U	0.5	U
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	8.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
Bromomethane	8.7	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Carbon disulfide	1000	0.92	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.21**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	**0.48**	J	**0.44**	J	**0.38**	J	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-D1		GS-D1		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D2		GS-D3		GS-D3		GS-D3		GS-D4	
Sample ID			GS-D1-B		GS-D1-C		GS-D2-A		GS-D2-B		GS-D2-C		GS-D2-W-25		GS-D2-W-50		GS-D2-W-75		GS-D2-W-100		GS-D3-A		GS-D3-B		GS-D3-C		GS-D4-A	
Sample Date			7/20/2007		7/20/2007		7/20/2007		7/20/2007		7/20/2007		9/10/2007		9/10/2007		9/10/2007		9/10/2007		7/23/2007		7/23/2007		7/23/2007		7/23/2007	
Depth Below Mudline			5 to 7		13 to 15		1 to 2		5 to 7		13 to 15		23 to 27		48 to 52		73 to 77		98 to 102		0.5 to 1.5		4.5 to 6.5		12.5 to 14.5		1 to 2	
Sample Elevation			-47.4 to -49.4		-55.4 to -57.4		-46.2 to -47.2		-50.2 to -52.2		-58.2 to -60.2		-69.2 to -73.2		-94.2 to -98.2		-119.2 to -123.2		-144.2 to -148.2		-48.0 to -49.0		-52.0 to -54.0		-60.0 to -62.0		-49.0 to -50.0	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	2.1	--	**1.5**		**0.97**		**0.4**	**J**	**0.3**	**J**	**0.3**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	**0.33**	**J**	**1.1**		**0.65**		0.5	U
cis-1,2-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.12**	**J**	**0.12**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	**0.37**	**J**
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	390	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Ethylbenzene	210	7.3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
Isopropylbenzene	660	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
m,p-Xylenes	--	1.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.25**	**J**	0.5	U	0.5	U	**0.24**	**J**	0.5	U
Methyltert-butylether	37	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.26**	**J**	**0.54**		**0.66**		0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
Naphthalene	0.2	12	2	U	2	U	2	U	2	U	2	U	**2**		**2.1**		**2**		**2**		2	U	2	U	2	U	**0.68**	**J**
o-Xylene	1400	13	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	1000	9.8	**0.77**		**4.1**		**0.33**	**J**	**3.4**		**3.2**		**21**		**71**		**88**		**160**		**0.31**	**J**	**4**		**15**		**0.42**	**J**
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.015	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D5		GS-D5		GS-D5	
Sample ID			GS-D4-B		GS-D4-C		GS-D4-C Dup		GS-D4-W-25		GS-D4-W-25 Dup		GS-D4-W-50		GS-D4-W-63		GS-D5-A		GS-D5-B		GS-D5-C	
Sample Date			7/23/2007		7/23/2007		7/23/2007		9/6/2007		9/6/2007		9/6/2007		9/6/2007		7/24/2007		7/24/2007		7/24/2007	
Depth Below Mudline			5 to 7		13 to 15		13 to 15		23 to 27		23 to 27		48 to 52		59 to 63		1 to 2		5 to 7		13 to 15	
Sample Elevation			-53.0 to -55.0		-61.0 to -63.0		-61.0 to -63.0		-70.1 to -74.1		-70.1 to -74.1		-95.1 to -99.1		-106.1 to -110.1		-46.5 to -47.5		-50.5 to -52.5		-58.5 to -60.5	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Conventionals (mg/L)																						
Ammonia	--	--	2.21		2.29		2.21		2.68		2.68		1.9		1.69		1.31		2		1.24	
Amenable cyanide	--	--	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U	0.01	U
Free Cyanide	0.014	0.0052	0.01	UJ	0.01	UJ	0.01	UJ	0.01	U	0.01	U	0.01	U	0.01	U	0.01	UJ	0.01	UJ	0.01	UJ
Total Cyanide	0.14	0.0052	0.03		0.03		0.03		0.01		0.009	J	0.01	U	0.009	J	0.01	U	0.01	U	0.004	J
Metals, Dissolved (mg/L)																						
Aluminum	0.05-0.2	0.087							0.0028		0.0029		0.0029		0.0032							
Antimony	0.006	0.03							0.0028	J	0.00242	J	0.00584	J	0.00098	J						
Arsenic	0.000014	0.0031							0.0542	J	0.0541	J	0.0305	J	0.0273	J						
Barium	--	--							0.213		0.213		0.152		0.339							
Beryllium	--	--							0.000003	J	0.000003	U	0.000003	U	0.000004	J						
Cadmium	0.005	0.000094							0.000008	U	0.000008	U	0.000025		0.000008	U						
Calcium metal	--	--							150		150		171		270							
Chromium	0.1	--							0.00003	U	0.00032	U	0.00032	U	0.00052							
Copper	1.3	0.0027							0.00045		0.00048		0.00198		0.00061							
Iron	--	--							36.6		36.7		30		46.4							
Lead	0.015	0.00054							0.000012	J	0.000007	J	0.000042		0.00003							
Magnesium	--	--							64.1		64.3		72.6		105							
Manganese	0.01	0.12							0.535		0.536		0.527		2.96							
Mercury	0.002	0.00077							0.00003	U	0.00003	U	0.00003	U	0.00003	U						
Nickel	0.46	0.016							0.00415		0.00406		0.0078		0.00657							
Potassium	--	--							10.4		9.59		7.81		10.1							
Selenium	0.42	0.005							0.0002	UJ	0.0002	UJ	0.0002	UJ	0.0002	UJ						
Silver	0.1	0.00036							0.000003	U	0.000003	U	0.000003	U	0.000003	U						
Sodium	--	--							218		218		126		155							
Thallium	--	--							0.000003	U	0.000003	U	0.00002	U	0.000003	U						
Zinc	26	0.036							0.00325		0.00427		0.00987		0.0158							
Metals, Total (mg/L)																						
Aluminum	0.05-0.2	--	9.22		41.9		9		1.41		1.16		2.18		15.9		1.06		21.3		9.93	
Antimony	0.006	0.03	0.00009	U	0.00004	U	0.00008	U	0.00518	J	0.00409	J	0.0117	J	0.00123	J	0.00024	U	0.0002	U	0.00036	
Arsenic	0.000014	0.0031	0.0372	J	0.033	J	0.0383	J	0.0507	J	0.0514	J	0.0245	J	0.0195	J	0.0386	J	0.0318	J	0.0284	J
Barium	--	--	0.221	J	0.389	J	0.222	J	0.225		0.224		0.178		0.486		0.0672	J	0.277	J	0.386	J
Beryllium	--	--	0.000324		0.00112		0.000314		0.000046		0.000049		0.000073		0.00052		0.000033		0.000498		0.000344	
Cadmium	0.005	0.00038	0.00004		0.000107		0.000037		0.000018	J	0.000015	J	0.000052		0.000108		0.000015	J	0.000071		0.000054	
Calcium metal	--	--	128		151		130		152		152		172		279		49.7		173		223	
Chromium	0.1	--	0.014		0.0215		0.0132		0.0311		0.0232		0.238		0.0807		0.00358		0.02		0.0237	
Copper	1.3	0.0036	0.0166		0.0318		0.0146		0.00773		0.00607		0.0468		0.0308		0.00291		0.0206		0.0182	
Iron	--	--	60		120		59.2		42.5		41.7		51.8		82.6		20.1		76.8		79.6	
Lead	0.015	0.00054	0.00322	J	0.00674	J	0.00292	J	0.000519		0.000428		0.00115		0.00394		0.00085	J	0.00389	J	0.00455	J
Magnesium	--	--	39.5		55.3		40.2		64.8		65		72.9		111		19.2		76		91.5	
Manganese	0.01	0.12	2.56		4.48		2.58		0.61		0.601		0.706		3.93		1.92		3.2		4.84	
Mercury	0.0000146	0.000012	0.00003	U	0.00003	J	0.00003	J	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U	0.00003	U
Nickel	0.46	0.049	0.0147		0.0293		0.0141		0.00719		0.00647		0.0232		0.0236		0.00441		0.0233		0.0204	
Potassium	--	--	9.25		11.4		9.37		9.59		10		7.43		11.4		4.51		9.05		8.73	
Selenium	0.42	0.035	0.0002	U	0.0004	U	0.0002	U	0.0002	UJ	0.0002	UJ	0.0002	UJ	0.0002	UJ	0.0002	U	0.0004	U	0.0006	J
Silver	0.1	0.00012	0.000003	U	0.000006	U	0.000003	U	0.00004	U	0.00004	U	0.00004	U	0.00004	U	0.000003	U	0.00004	U	0.000003	U
Sodium	--	--	173		176		177		219		220		126		157		61		102		119	
Thallium	--	--	0.00004	U	0.000101	U	0.000033	U	0.00002	U	0.00002	U	0.00002	U	0.000066		0.000003	U	0.000058	U	0.000044	U
Zinc	26	0.033	0.115	J	0.0947	J	0.107	J	0.0198		0.016		0.134		0.0941		0.0376	J	0.104	J	0.121	J

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D5		GS-D5		GS-D5	
Sample ID			GS-D4-B		GS-D4-C		GS-D4-C Dup		GS-D4-W-25		GS-D4-W-25 Dup		GS-D4-W-50		GS-D4-W-63		GS-D5-A		GS-D5-B		GS-D5-C	
Sample Date			7/23/2007		7/23/2007		7/23/2007		9/6/2007		9/6/2007		9/6/2007		9/6/2007		7/24/2007		7/24/2007		7/24/2007	
Depth Below Mudline			5 to 7		13 to 15		13 to 15		23 to 27		23 to 27		48 to 52		59 to 63		1 to 2		5 to 7		13 to 15	
Sample Elevation			-53.0 to -55.0		-61.0 to -63.0		-61.0 to -63.0		-70.1 to -74.1		-70.1 to -74.1		-95.1 to -99.1		-106.1 to -110.1		-46.5 to -47.5		-50.5 to -52.5		-58.5 to -60.5	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
SVOC (ug/L)																						
2-Methylnaphthalene	0.2	2.1	**0.0071**	**J**	0.019	U	**0.0078**	**J**	**15**		**9.8**		**0.33**		**1.9**		**0.06**		**3.7**		**150**	
Acenaphthene	0.2	520	**0.0094**	**J**	0.019	U	**0.017**	**J**	**21**		**14**		**0.5**		**1.9**		**38**		**89**		**84**	
Acenaphthylene	0.2	--	**0.0041**	**J**	0.019	U	**0.015**	**J**	**1.5**		**0.97**		**0.11**		**0.11**		**0.23**		**0.35**		**0.51**	
Anthracene	0.2	0.73	0.02	UJ	0.019	UJ	**0.013**	**J**	**9.9**		**5.8**		**0.31**		**0.42**		**0.4**	**J**	**0.82**	**J**	**0.05**	**J**
Benzo(a)anthracene	0.0018	0.027	**0.0082**	**J**	**0.0045**	**J**	**0.037**		**7.5**		**4.3**		**0.35**		**0.32**		**0.021**		**0.0088**	**J**	**0.046**	
Benzo(a)pyrene	0.0018	0.014	R		R		R		**7.9**		**4.7**		**0.34**		**0.36**		**0.013**	**J**	**0.0044**	**J**	**0.041**	**J**
Benzo(b)fluoranthene	0.0018	--	**0.013**	**J**	0.019	U	**0.035**		**8.5**		**5.2**		**0.67**		**0.41**		**0.014**	**J**	**0.0057**	**J**	**0.042**	
Benzo(g,h,i)perylene	0.2	--	**0.0078**	**J**	0.019	U	**0.025**		**6.2**		**3.7**		**0.34**		**0.34**		**0.0082**	**J**	**0.0042**	**J**	**0.033**	
Benzo(k)fluoranthene	0.0018	--	**0.0039**	**J**	0.019	U	**0.018**	**J**	**2.4**		**1.4**		0.02	U	**0.098**		**0.0056**	**J**	0.02	U	**0.013**	**J**
Chrysene	0.0018	--	**0.019**	**J**	0.019	U	**0.051**		**7.9**		**4.7**		**0.43**		**0.37**		**0.019**	**J**	**0.0075**	**J**	**0.054**	
Dibenzo(a,h)anthracene	0.0018	--	0.02	U	0.019	U	0.021	U	**0.73**		**0.48**		**0.034**		**0.033**		0.02	U	0.02	U	**0.0052**	**J**
Dibenzofuran	12	3.7	0.02	U	0.019	U	0.021	U	**1.4**		**0.9**		**0.043**		**0.11**		**0.039**		**1.3**		**2.1**	
Fluoranthene	0.2	--	**0.051**		**0.014**	**J**	**0.16**		**28**		**17**		**1.3**		**1.3**		**0.076**		**0.14**		**0.14**	
Fluorene	0.2	3.9	**0.0052**	**J**	0.019	U	**0.013**	**J**	**9.2**		**5.8**		**0.31**		**0.6**		**8.5**		**14**		**15**	
Indeno(1,2,3-cd)pyrene	0.0018	--	**0.006**	**J**	0.019	U	**0.022**		**6.2**		**3.7**		**0.29**		**0.32**		**0.008**	**J**	**0.0043**	**J**	**0.032**	
Naphthalene	0.2	12	**0.029**		0.019	U	**0.023**		**30**		**22**		**2.2**		**11**		**0.13**		**27**		**820**	
Phenanthrene	0.2	--	**0.041**		**0.0075**	**J**	**0.15**		**58**		**36**		**2.3**		**2.8**		**5.4**		**10**		**0.9**	
Pyrene	0.2	--	**0.047**		**0.013**	**J**	**0.16**		**29**		**18**		**1.4**		**1.3**		**0.07**		**0.08**		**0.15**	
VOC (ug/L)																						
1,1,1,2-Tetrachloroethane	2.5	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,1,1-Trichloroethane	200	11	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,1,2,2-Tetrachloroethane	0.33	610	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,1,2-Trichloroethane	1.2	1200	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,1-Dichloroethane	1200	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,1-Dichloroethene	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,2,3-Trichloropropane	0.0095	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,2,4-Trichlorobenzene	7	110	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	20	U
1,2-Dibromoethane	0.033	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	20	U
1,2-Dichlorobenzene	49	14	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,2-Dichloroethane	0.73	910	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,2-Dichloropropane	0.97	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,3-Dichlorobenzene	14	71	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
1,4-Dichlorobenzene	2.8	15	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
2-Butanone (MEK)	7100	14000	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	200	UJ
2-Chloroethylvinylether	--	--	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	50	UJ
2-Hexanone	--	99	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	200	UJ
4-Methyl-2-pentanone (MIBK)	2000	170	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	200	UJ
Acetone	5500	1500	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	200	UJ
Acrolein	0.042	21	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	200	UJ
Acrylonitrile	0.12	2600	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	50	UJ
Benzene	1.2	130	0.5	U	0.5	U	0.5	U	**0.14**	**J**	0.5	U	**0.87**		**0.35**	**J**	0.5	U	**17**		**14**	
Bromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Bromodichloromethane	1.1	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Bromoform	8.5	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	5	UJ
Bromomethane	8.7	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Carbon disulfide	1000	0.92	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Carbon tetrachloride	0.51	9.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Chlorobenzene	91	50	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.48**	**J**	5	U

Table 1.3
Phase 2 Water Chemistry Data

Location ID	JSCS Human Health (Lowest Criteria)	JSCS Ecological (Lowest Criteria)	GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D4		GS-D5		GS-D5		GS-D5	
Sample ID			GS-D4-B		GS-D4-C		GS-D4-C Dup		GS-D4-W-25		GS-D4-W-25 Dup		GS-D4-W-50		GS-D4-W-63		GS-D5-A		GS-D5-B		GS-D5-C	
Sample Date			7/23/2007		7/23/2007		7/23/2007		9/6/2007		9/6/2007		9/6/2007		9/6/2007		7/24/2007		7/24/2007		7/24/2007	
Depth Below Mudline			5 to 7		13 to 15		13 to 15		23 to 27		23 to 27		48 to 52		59 to 63		1 to 2		5 to 7		13 to 15	
Sample Elevation			-53.0 to -55.0		-61.0 to -63.0		-61.0 to -63.0		-70.1 to -74.1		-70.1 to -74.1		-95.1 to -99.1		-106.1 to -110.1		-46.5 to -47.5		-50.5 to -52.5		-58.5 to -60.5	
Sample Matrix			Water		Water		Water		Water		Water		Water		Water		Water		Water		Water	
Chloroethane	23	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Chloroform	0.17	28	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Chloromethane	2.1	--	0.5	U	0.5	U	0.5	U	**0.35**	**J**	0.5	U	**0.15**	**J**	**0.24**	**J**	0.5	U	0.5	U	5	U
cis-1,2-Dichloroethene	--	--	**0.14**	**J**	0.5	U	**0.16**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
cis-1,3-Dichloropropene	--	0.055	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Dibromochloromethane	--	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Dibromomethane	61	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Dichlorodifluoromethane	390	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Dichloromethane	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	20	U
Ethylbenzene	210	7.3	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**26**		**110**	
Hexachlorobutadiene	0.86	9.3	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	20	U
Iodomethane	--	--	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	50	U
Isopropylbenzene	660	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	**0.93**	**J**	**14**		**13**	**J**
m,p-Xylenes	--	1.8	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.4**	**J**	**0.22**	**J**	**0.23**	**J**	**3**		**11**	
Methyltert-butylether	37	--	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	5	UJ
Naphthalene	0.2	12	2	U	2	U	2	U	**24**		**29**		**3.7**		**12**		2	U	**42**		**1000**	
o-Xylene	1400	13	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	**0.11**	**J**	0.5	U	**0.31**	**J**	**5.2**		**21**	
Styrene	100	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Tetrachloroethene	0.12	98	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Toluene	1000	9.8	**1.5**		**1.6**		**1.5**		**56**		**43**		**290**		**140**		**0.72**		**2.5**		**21**	
trans-1,2-Dichloroethene	100	590	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
trans-1,3-Dichloropropene	0.4	0.055	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U	0.5	UJ	0.5	UJ	5	UJ
trans-1,4-Dichloro-2-butene	7100	--	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	10	UJ	100	UJ
Trichloroethene	0.17	47	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Trichlorofluoromethane	1300	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U
Vinyl acetate	410	16	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	50	UJ
Vinyl chloride	0.015	--	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	5	U

Table 1.4
Phase 2 Soil Analytical Data

Location ID	GS-B2		GS-B2		GS-B2		GS-B5		GS-B5		GS-B5		GS-B7		GS-B7		GS-B7		GS-C2		GS-C2		GS-C5		GS-C5	
Sample ID	GS-B2-S-(0-2)		GS-B2-S-(5-7)		GS-B2-S-(13-15)		GS-B5-S-(0-2)		GS-B5-S-(5-7)		GS-B5-S-(13-15)		GS-B7-S (0-2)		GS-B7-S (5-7)		GS-B7-S (13-15)		GS-C2-S-(0-2)		GS-C2-S-(5-7)		GS-C5-S-(0-2)		GS-C5-S-(5-7)	
Sample Date	9/21/2007		9/21/2007		9/21/2007		9/21/2007		9/21/2007		9/21/2007		8/30/2007		8/30/2007		8/30/2007		9/21/2007		9/21/2007		9/20/2007		9/20/2007	
Depth Below Mudline	0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		0 to 2		5 to 7	
Sample Elevation	-27.0 to -29.0		-32.0 to -34.0		-40.0 to -42.0		-20.4 to -22.4		-25.4 to -27.4		-33.4 to -35.4		-29.7 to -31.7		-34.7 to -36.7		-42.7 to -44.7		-40.4 to -42.4		-45.4 to -47.4		-42.5 to -44.5		-47.5 to -49.5	
Sample Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Conventionals (mg/kg)																										
Ammonia	152		436		93.4		261		327		99.4		178	J	179	J	129	J	12.4		8.81		21.3		10.6	
Sulfide	143	J	438	J	1	UJ	101	J	5.2	J	1	UJ	25.8	J	16.7	J	104	J	56.9	J	13.1	J	1	UJ	1	UJ
Total Cyanide	24.8		0.46		0.19	J	0.24	J	0.13	J	0.2	J	1		1.6		1.2		0.2	U	0.2	U	0.11	J	0.2	J
Conventionals (%)																										
Total organic carbon													3.01		5.78		2.62									
Total solids	60.4		53.7		75.5		61.8		60.8		72.2		54.5		60.4		62.9		67.6		79.2		67.9		78.6	
Grain Size (%)																										
Gravel, Coarse	0		0		0		0		0		0		19		0		6.6		0		0		0.2		0	
Gravel, Medium	0.1		0		0		0.7		0		0.3		5.4		0		2.1		0.1		0		0.1		0	
Gravel, Fine	0.5		0		0		0.6		0		0.2		1.8		0.1		1.5		0.2		0.1		0.3		0	
Sand, Very Coarse	1.2		0.1		0.1		2.3		0.1		0.9		1.8		2.1		2.8		1.1		0.8		0.2		0.2	
Sand, Coarse	3.6		0.3		2.7		4.1		1.1		0.9		4.6		3.5		10.1		18.8		33.9		8.9		9.9	
Sand, Medium	16.8		1		50.1		7		4.2		2.9		5.3		13		23.8		46.9		47		44.8		56.5	
Sand, Fine	49.6		4.4		30.6		15.8		5.1		16		10.7		23.3		20.4		16.4		10.54		34.6		28.97	
Sand, Very Fine	8.9		3.4		2.3		5.3		3		8.3		4.3		4.5		3.2		1.8		0.61		1.33		0.43	
Fines	19.3		90.8		14.2		64.2		86.5		70.5		47.1		53.5		29.5		14.7		7.05		9.57		4	
TPH (mg/kg)																										
TPH-Diesel Range	1000	H	980	H	5.4	J	7000	DZ	1100	H	8.2	J	700		64000		13000		5400	DZ	260	Z	120	Z	2	J
TPH-Residual Range	2300	O	1900	O	22	J	3600	DZ	1900	O	15	J	1100		25000		8000		3800	DZ	290	Z	140	Z	5.4	J
Metals (mg/kg)																										
Aluminum	25100		28300		18500		16600		25700		26500		23500		24500		19200		17400		9740		14600		9820	
Antimony	0.21	UJ	0.27	J	0.08	UJ	0.16	UJ	0.21	UJ	0.11	UJ	0.31		0.26		0.18		0.11	UJ	0.13	UJ	0.11	UJ	0.09	UJ
Arsenic	3.2		4		1.6		2.6		3.7		1.9		3.18		2.91		2.38		1.7		1.7		1.8		1.4	
Barium	154		207		133		134		156		154		176		173		165		132		90.6		134		87	
Beryllium	0.597		0.782		0.398		0.532		0.631		0.415		0.61		0.59		0.51		0.429		0.355		0.475		0.293	
Cadmium	0.206		0.436		0.08		0.299		0.337		0.069		0.275		0.376		0.184		0.096		0.052		0.061		0.047	
Calcium metal	5880		6300		5150		4770		6220		7170		5750	J	5450	J	5070	J	5960		4300		4640		3720	
Chromium	33.3	J	38.1	J	22.9	J	28.6	J	33.7	J	32.9	J	28.1		26.6		22.2		22	J	15.6	J	19.1	J	16.9	J
Copper	30.3		41.3		13.9		27.5		34.7		18.1		39.6		34.3		27.3		14.7		12.8		16		12.4	
Iron	35000		37900		28600		27000		33800		36100		37600		40400		32800		30100		24000		29300		24700	
Lead	13.8		34.8		3.57		17.5		31.4		3.56		21.5		34.2		17.2		10.3		2.86		4.82		2.62	
Magnesium	5390		6170		4470		4610		5750		6560		5620		5520		4800		4090		3210		4110		3740	
Manganese	446		711		325		413		548		434		620		726		400		276		215		261		229	
Mercury	0.14		0.329		0.017		0.27		0.295		0.025		0.088		0.118		0.046		0.029		0.014	J	0.014	J	0.011	J
Nickel	29.9		25.1		17.8		19.4		19.8		19.1		23		25.1		24.5		15.6		15.4		17		16.1	
Potassium	834		927		684		730		865		864		849		896		761		922		756		696		559	
Selenium	0.4	U	0.3	U	0.3	U	0.3	U	0.4	U	0.3	U							0.3	U	0.3	U	0.3	U	0.3	U
Silver	0.156		0.501		0.031		0.3		0.568		0.044		0.28		0.44		0.15		0.054		0.032		0.037		0.024	
Sodium	764	J	580	J	608	J	325	J	577	J	949	J	440		485		484		741	J	458	J	481	J	408	J
Thallium	0.087		0.118		0.047		0.083		0.109		0.056		0.116		0.125		0.09		0.056		0.052		0.051		0.042	
Zinc	93.7		209		61.7		94.5		110		68.4		120		182		81.6		73.2		49.4		54.2		48.2	
SVOC (ug/kg)																										
2-Methylnaphthalene	2000		590		60		100000		2200		43		1400		320000	J	240000		46000		570		3.5	J	1.2	J
Acenaphthene	8000		4400		480		140000		11000		91		15000		420000	J	220000		100000		7300		120		8	
Acenaphthylene	580		300		62		3200		510		6.2		660		10000	J	97000		4300		1200		10		1	J
Anthracene	9600		5100		260		43000		10000		50		3100		200000	J	170000		41000		5000		49		7.1	
Benzo(a)anthracene	17000		12000		1200		28000		11000		46		6300		130000	J	140000		29000		7600		80		10	
Benzo(a)pyrene	18000		16000		1900		37000		19000		65		7800		140000	J	150000		36000		10000		110		9.1	

Table 1.4
Phase 2 Soil Analytical Data

Location ID	GS-B2		GS-B2		GS-B2		GS-B5		GS-B5		GS-B5		GS-B7		GS-B7		GS-B7		GS-C2		GS-C2		GS-C5		GS-C5	
Sample ID	GS-B2-S-(0-2)		GS-B2-S-(5-7)		GS-B2-S-(13-15)		GS-B5-S-(0-2)		GS-B5-S-(5-7)		GS-B5-S-(13-15)		GS-B7-S (0-2)		GS-B7-S (5-7)		GS-B7-S (13-15)		GS-C2-S-(0-2)		GS-C2-S-(5-7)		GS-C5-S-(0-2)		GS-C5-S-(5-7)	
Sample Date	9/21/2007		9/21/2007		9/21/2007		9/21/2007		9/21/2007		9/21/2007		8/30/2007		8/30/2007		8/30/2007		9/21/2007		9/21/2007		9/20/2007		9/20/2007	
Depth Below Mudline	0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		0 to 2		5 to 7	
Sample Elevation	-27.0 to -29.0		-32.0 to -34.0		-40.0 to -42.0		-20.4 to -22.4		-25.4 to -27.4		-33.4 to -35.4		-29.7 to -31.7		-34.7 to -36.7		-42.7 to -44.7		-40.4 to -42.4		-45.4 to -47.4		-42.5 to -44.5		-47.5 to -49.5	
Sample Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Benzo(b)fluoranthene	**18000**		**16000**		**1700**		**31000**		**15000**		**58**		**7900**		**130000**	**J**	**150000**		**31000**		**9100**		**93**		**9.5**	
Benzo(g,h,i)perylene	**13000**		**11000**		**1800**		**29000**		**20000**		**64**		**6700**		**100000**	**J**	**110000**		**26000**		**8000**		**83**		**7.9**	
Benzo(k)fluoranthene	**5600**		**5300**		**490**		**9700**		**4400**		**20**		**2200**		**34000**	**J**	**38000**		**9700**		**3000**		**29**		**3**	**J**
Chrysene	**18000**		**12000**		**1400**		**30000**		**13000**		**52**		**6300**		**120000**	**J**	**130000**		**32000**		**7600**		**110**		**12**	
Dibenzo(a,h)anthracene	**2100**		**1800**		**180**		**3400**		**1300**		**7.9**		**740**		**11000**	**J**	**11000**		**3300**		**1000**		**12**		**1.3**	**J**
Dibenzofuran	**730**		**680**		**22**		**6300**		**470**		**5.1**		**630**		**26000**	**J**	**23000**		**6100**		**150**		**2.1**	**J**	4.7	U
Fluoranthene	**46000**		**35000**		**5300**		**140000**		**58000**		**180**		**14000**		**510000**	**J**	**530000**		**130000**		**32000**		**270**		**43**	
Fluorene	**5300**		**2400**		**270**		**45000**		**4500**		**37**		**5600**		**170000**	**J**	**150000**		**42000**		**3300**		**45**		**4.5**	**J**
Indeno(1,2,3-cd)pyrene	**13000**		**11000**		**1600**		**27000**		**16000**		**58**		**6500**		**100000**	**J**	**110000**		**25000**		**7800**		**79**		**7.1**	
Naphthalene	**2600**	**J**	**760**	**J**	**380**	**J**	**930000**	**J**	**3400**	**J**	**160**	**J**	**4000**		**1300000**		**1400000**		**33000**	**J**	**1000**	**J**	**13**	**J**	4.7	UJ
Phenanthrene	**45000**		**25000**		**4100**		**270000**		**54000**		**280**		**22000**		**1100000**	**J**	**1000000**		**240000**		**22000**		**300**		**37**	
Pyrene	**46000**		**33000**		**6000**		**160000**		**60000**		**200**		**15000**		**580000**	**J**	**620000**		**150000**		**40000**		**290**		**46**	
VOC (ug/kg)																										
1,1,1,2-Tetrachloroethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,1,1-Trichloroethane	2.4	U	2.4	UJ	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,1,2,2-Tetrachloroethane	2.4	U	2.4	UJ	1.2	U	630	U	1.9	U	1.3	U	2.2	UJ	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,1,2-Trichloroethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,1-Dichloroethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,1-Dichloroethene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,2,3-Trichloropropane	2.4	U	2.4	UJ	1.2	U	630	U	1.9	U	1.3	U	5.5	UJ	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,2,4-Trichlorobenzene	48	U	47	UJ	24	U	2500	U	38	U	26	U	44	UJ	5100	U	21000	U	460	U	28	U	28	U	26	U
1,2-Dibromoethane	48	U	47	U	24	U	2500	U	38	U	26	U	44	U	5100	U	21000	U	460	U	28	U	28	U	26	U
1,2-Dichlorobenzene	2.4	U	2.4	UJ	1.2	U	630	U	1.9	U	1.3	U	2.2	UJ	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,2-Dichloroethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,2-Dichloropropane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,3-Dichlorobenzene	2.4	U	2.4	UJ	1.2	U	630	U	1.9	U	1.3	U	2.2	UJ	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
1,4-Dichlorobenzene	2.4	U	2.4	UJ	1.2	U	630	U	1.9	U	1.3	U	2.2	UJ	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
2-Butanone (MEK)	**13**	**J**	**23**	**J**	**4.4**	**J**	25000	UJ	**14**	**J**	5.1	UJ	11	UJ	51000	UJ	210000	UJ	4600	UJ	5.5	UJ	5.5	UJ	5.2	UJ
2-Chloroethylvinylether	12	U	12	U	6	U	6300	U	9.5	U	6.4	U	11	U	13000	UJ	53000	UJ	1200	U	6.8	U	6.9	U	6.5	U
2-Hexanone	12	U	12	U	6	U	25000	UJ	9.5	U	6.4	U	11	U	51000	UJ	210000	UJ	4600	UJ	6.8	U	6.9	U	6.5	U
4-Methyl-2-pentanone (MIBK)	4.8	U	4.7	U	2.4	U	25000	UJ	3.8	U	2.6	U	4.4	U	51000	U	210000	U	4600	UJ	2.8	U	2.8	U	2.6	U
Acetone	**56**	**J**	**94**	**J**	**28**	**J**	**4900**	**J**	**58**	**J**	15	UJ	31	U	**14000**	**J**	**60000**	**J**	4600	UJ	18	UJ	14	UJ	13	UJ
Acrolein	240	UJ	240	UJ	120	UJ	25000	UJ	190	UJ	130	UJ	220	UJ	51000	UJ	210000	UJ	4600	UJ	140	UJ	140	UJ	130	UJ
Acrylonitrile	4.8	U	4.7	U	2.4	U	25000	U	3.8	U	2.6	U	4.4	U	51000	U	210000	U	4600	U	2.8	U	2.8	U	2.6	U
Benzene	2.4	U	2.4	U	1.2	U	**4600**		1.9	U	1.3	U	2.2	U	**14000**		**3400**	**J**	120	U	1.4	U	1.4	U	1.3	U
Bromochloromethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Bromodichloromethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Bromoform	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Bromomethane	6	U	5.8	U	3	U	630	U	4.8	U	3.2	U	2.2	U	1300	UJ	5300	UJ	120	U	3.4	U	3.5	U	3.3	U
Carbon disulfide	**0.45**	**J**	**0.72**	**J**	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Carbon tetrachloride	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Chlorobenzene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Chloroethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Chloroform	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Chloromethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
cis-1,2-Dichloroethene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
cis-1,3-Dichloropropene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Dibromochloromethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Dibromomethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U

Table 1.4
Phase 2 Soil Analytical Data

Location ID	GS-B2		GS-B2		GS-B2		GS-B5		GS-B5		GS-B5		GS-B7		GS-B7		GS-B7		GS-C2		GS-C2		GS-C5		GS-C5	
Sample ID	GS-B2-S-(0-2)		GS-B2-S-(5-7)		GS-B2-S-(13-15)		GS-B5-S-(0-2)		GS-B5-S-(5-7)		GS-B5-S-(13-15)		GS-B7-S (0-2)		GS-B7-S (5-7)		GS-B7-S (13-15)		GS-C2-S-(0-2)		GS-C2-S-(5-7)		GS-C5-S-(0-2)		GS-C5-S-(5-7)	
Sample Date	9/21/2007		9/21/2007		9/21/2007		9/21/2007		9/21/2007		9/21/2007		8/30/2007		8/30/2007		8/30/2007		9/21/2007		9/21/2007		9/20/2007		9/20/2007	
Depth Below Mudline	0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		0 to 2		5 to 7	
Sample Elevation	-27.0 to -29.0		-32.0 to -34.0		-40.0 to -42.0		-20.4 to -22.4		-25.4 to -27.4		-33.4 to -35.4		-29.7 to -31.7		-34.7 to -36.7		-42.7 to -44.7		-40.4 to -42.4		-45.4 to -47.4		-42.5 to -44.5		-47.5 to -49.5	
Sample Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Dichlorodifluoromethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Dichloromethane	12	U	12	U	6	U	2500	U	9.5	U	6.4	U	11	U	**550**	**J**	21000	U	**45**	**J**	6.8	U	6.9	U	6.5	U
Ethylbenzene	**1.2**	**J**	2.4	U	1.2	U	**90000**		**5.4**		**0.52**	**J**	2.2	U	**13000**		**42000**		**670**		1.4	U	1.4	U	1.3	U
Hexachlorobutadiene	4.8	U	4.7	UJ	2.4	U	2500	U	3.8	U	2.6	U	4.4	UJ	5100	U	21000	U	460	U	2.8	U	2.8	U	2.6	U
Iodomethane	24	U	24	U	12	U	6300	U	19	U	13	U	22	U	13000	U	53000	U	1200	U	14	U	14	U	13	U
Isopropylbenzene	**18**		**18**		**0.24**	**J**	**7400**		**54**		1.3	U	**2.3**		**2800**	**J**	**10000**	**J**	**1400**		**0.77**	**J**	**0.3**	**J**	1.3	U
m,p-Xylenes	**1.2**	**J**	**2.3**	**J**	1.2	U	**24000**		**1.3**	**J**	1.3	U	**0.72**	**J**	**7000**		**59000**		**210**		1.4	U	1.4	U	1.3	U
Methyltert-butylether	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Naphthalene	**23**		**19**	**J**	2.1	U	**1200000**	**J**	**40**		**46**		**5.3**	**J**	**570000**		**3500000**		**180000**	**J**	**2600**	**J**	1.4	U	1.3	U
o-Xylene	**3.4**		**1.9**	**J**	1.2	U	**20000**		**5.1**		1.3	U	**1.5**	**J**	**5300**		**24000**		**260**		1.4	U	1.4	U	1.3	U
Styrene	**0.47**	**J**	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	**34**	**J**	1.4	U	1.4	U	1.3	U
Tetrachloroethene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Toluene	**1.1**	**J**	**1**	**J**	**0.42**	**J**	**890**		**0.97**	**J**	**0.37**	**J**	**0.41**	**J**	**480**	**J**	**3900**	**J**	**23**	**J**	**0.19**	**J**	**1.2**	**J**	**2.9**	
trans-1,2-Dichloroethene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
trans-1,3-Dichloropropene	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
trans-1,4-Dichloro-2-butene	4.8	U	4.7	UJ	2.4	U	13000	U	3.8	U	2.6	U	4.4	UJ	26000	U	110000	U	2300	U	2.8	U	2.8	U	2.6	U
Trichloroethene	**1.4**	**J**	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	**0.57**	**J**	**0.49**	**J**
Trichlorofluoromethane	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U
Vinyl acetate	2.4	UJ	2.4	UJ	1.3	UJ	6300	UJ	1.9	UJ	1.4	UJ	5.5	UJ	13000	UJ	53000	UJ	1200	UJ	1.4	UJ	1.4	UJ	1.3	UJ
Vinyl chloride	2.4	U	2.4	U	1.2	U	630	U	1.9	U	1.3	U	2.2	U	1300	U	5300	U	120	U	1.4	U	1.4	U	1.3	U

Table 1.4
Phase 2 Soil Analytical Data

Location ID	GS-C5		GS-C7		GS-C7		GS-C7		GS-D2		GS-D2		GS-D4		GS-D4	
Sample ID	GS-C5-S-(13-15)		GS-C7-S-(0-2)		GS-C7-S-(5-7)		GS-C7-S-(13-15)		GS-D2-S-(0-2)		GS-D2-S-(5-7)		GS-D4-S-(0-2)		GS-D4-S-(5-7)	
Sample Date	9/20/2007		9/19/2007		9/19/2007		9/19/2007		9/20/2007		9/20/2007		9/20/2007		9/20/2007	
Depth Below Mudline	13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		0 to 2		5 to 7	
Sample Elevation	-55.5 to -57.5		-38.4 to -40.4		-43.4 to -45.4		-51.4 to -53.4		-44.3 to -46.3		-49.3 to -51.3		-45.1 to -47.1		-50.1 to -52.1	
Sample Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Conventionals (mg/kg)																
Ammonia	6.98		129		63.1		69.3		21.1		15.6		29		20.4	
Sulfide	1	UJ	15.8	J	3.7	J	1	UJ	1	UJ	1	UJ	1	UJ	1	UJ
Total Cyanide	0.14	J	0.07	J	0.2	UJ	0.1	J	0.2	UJ	0.2	UJ	0.2	UJ	0.08	J
Conventionals (%)																
Total organic carbon																
Total solids	79.5		51.3		72.4		78.2		73		83.3		73.6		83.2	
Grain Size (%)																
Gravel, Coarse	0		0.2		0		0		0		0		0.8		0	
Gravel, Medium	0		0		0.1		0		0		0		0.5		1.2	
Gravel, Fine	0		0.3		0		0		0.2		1.3		0.9		3.3	
Sand, Very Coarse	0.3		0.8		0.4		0		2.8		5		3.2		5.5	
Sand, Coarse	16.8		4.5		10		25.3		48.3		58.2		36.7		39	
Sand, Medium	42.7		25.9		51.8		50.1		33.9		27.74		37.4		39.2	
Sand, Fine	29.1		33.1		14.3		13.8		6.36		4.8		10.57		8.37	
Sand, Very Fine	1.72		5.7		2.7		1.6		0.91		0.28		1.14		0.39	
Fines	9.38		29.5		20.7		9.2		7.53		2.68		8.79		3.04	
TPH (mg/kg)																
TPH-Diesel Range	27	U	17000	DZ	12000	DZ	3.5	J	5.2	J	25	U	2.4	J	25	U
TPH-Residual Range	4.6	J	7200	DZ	5300	DZ	5	J	18	J	100	U	12	J	100	U
Metals (mg/kg)																
Aluminum	13500		16100		12900		8690		10800		6900		10300		9530	
Antimony	0.08	UJ	0.22	UJ	0.14	UJ	0.26	J	0.18	UJ	0.08	UJ	0.1	UJ	0.08	UJ
Arsenic	1.5		2		2		1.3		2.4		2.3		2.8		2.6	
Barium	117		155		88.3		107		110		81.6		86.8		77.5	
Beryllium	0.346		0.575		0.405		0.331		0.381		0.332		0.374		0.279	
Cadmium	0.05		0.165		0.132		0.047		0.052		0.041		0.048		0.055	
Calcium metal	4520		4750		3970		3340		3960		2810		3960		3770	
Chromium	18.4	J	23.5	J	19.4	J	14.7	J	17.1	J	11.4	J	16.8	J	16.4	J
Copper	12.5		21.1		17.2		12.1		13.7		12		13.3		11.8	
Iron	26500		30600		24900		22200		26200		18900		25700		25000	
Lead	2.44		14.4		10.3		2.43		3.17		2.24		2.37		2.2	
Magnesium	3910		4650		3720		3170		3400		2550		3300		3200	
Manganese	237		364		275		232		288		206		252		277	
Mercury	0.007	J	0.054		0.036		0.009	J	0.113		0.006	J	0.012	J	0.004	J
Nickel	15.9		17.7		17.4		14.1		15		12.8		14.8		14.2	
Potassium	762		791		595		469		637		523		475		481	U
Selenium	0.3	U	0.3	U	0.5	J	0.3	U	0.4	J	0.4	J	0.4	J	0.4	U
Silver	0.023		0.122		0.096		0.021	J	0.031		0.022	J	0.029		0.031	
Sodium	553	J	368	J	405	J	265	J	601	J	488	J	459	J	437	J
Thallium	0.057		0.069		0.204		0.049		0.055		0.056		0.046		0.041	
Zinc	50.5		99.7		78		46.3		50.7		38.8		48		48.4	
SVOC (ug/kg)																
2-Methylnaphthalene	0.91	J	370000		240000		13		2.2	J	1.3	J	0.94	J	0.99	J
Acenaphthene	0.44	J	390000		260000		31		7.3		2.8	J	2.6	J	1.8	J
Acenaphthylene	4.9	U	8900		6700		4.7	J	2.8	J	0.53	J	0.57	J	5	U
Anthracene	4.9	U	160000		110000		46		21		3.3	J	3.7	J	1.3	J
Benzo(a)anthracene	4.9	U	82000		55000		43		25		4.1	J	5		2.5	J
Benzo(a)pyrene	4.9	U	100000		71000		50		28		4.1	J	5.2		2.3	J

Table 1.4
Phase 2 Soil Analytical Data

Location ID	GS-C5		GS-C7		GS-C7		GS-C7		GS-D2		GS-D2		GS-D4		GS-D4	
Sample ID	GS-C5-S-(13-15)		GS-C7-S-(0-2)		GS-C7-S-(5-7)		GS-C7-S-(13-15)		GS-D2-S-(0-2)		GS-D2-S-(5-7)		GS-D4-S-(0-2)		GS-D4-S-(5-7)	
Sample Date	9/20/2007		9/19/2007		9/19/2007		9/19/2007		9/20/2007		9/20/2007		9/20/2007		9/20/2007	
Depth Below Mudline	13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		0 to 2		5 to 7	
Sample Elevation	-55.5 to -57.5		-38.4 to -40.4		-43.4 to -45.4		-51.4 to -53.4		-44.3 to -46.3		-49.3 to -51.3		-45.1 to -47.1		-50.1 to -52.1	
Sample Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Benzo(b)fluoranthene	4.9	U	**81000**		**60000**		**45**		**26**		**4.5**	**J**	**5**		**2.5**	**J**
Benzo(g,h,i)perylene	4.9	U	**63000**		**50000**		**42**		**24**		**4.5**	**J**	**4.5**	**J**	**2.4**	**J**
Benzo(k)fluoranthene	4.9	U	**26000**		**19000**		**15**		**7.8**		**1.7**	**J**	**1.4**	**J**	**0.8**	**J**
Chrysene	4.9	U	**110000**		**68000**		**50**		**29**		**4.6**	**J**	**5.4**		**2.4**	**J**
Dibenzo(a,h)anthracene	4.9	U	**9100**		**6700**		**5.6**		**3.5**	**J**	**1.3**	**J**	**0.64**	**J**	**0.38**	**J**
Dibenzofuran	4.9	U	**26000**		**17000**		**3**	**J**	**1**	**J**	4.9	U	4.7	U	5	U
Fluoranthene	4.9	U	**380000**		**280000**		**160**		**80**		**12**		**16**		**6.7**	
Fluorene	4.9	U	**150000**		**100000**		**25**		**7.3**		**1.7**	**J**	**1.3**	**J**	**0.72**	**J**
Indeno(1,2,3-cd)pyrene	4.9	U	**63000**		**49000**		**40**		**22**		**4.3**	**J**	**4.2**	**J**	**2.2**	**J**
Naphthalene	4.9	UJ	**1200000**	**J**	**750000**	**J**	**25**	**J**	5.3	UJ	4.9	UJ	4.7	UJ	5	UJ
Phenanthrene	**1.2**	**J**	**870000**		**620000**		**280**		**100**		**17**		**19**		**7.6**	
Pyrene	**0.66**	**J**	**390000**		**290000**		**160**		**86**		**13**		**17**		**7.2**	
VOC (ug/kg)																
1,1,1,2-Tetrachloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,1,1-Trichloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,1,2,2-Tetrachloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,1,2-Trichloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,1-Dichloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,1-Dichloroethene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,2,3-Trichloropropane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,2,4-Trichlorobenzene	25	U	460	U	1700	U	28	U	30	U	23	U	27	U	24	U
1,2-Dibromoethane	25	U	460	U	1700	U	28	U	30	U	23	U	27	U	24	U
1,2-Dichlorobenzene	1.3	U	120	U	430	U	1.4	U	**1.9**		1.2	U	1.4	U	1.2	U
1,2-Dichloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,2-Dichloropropane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,3-Dichlorobenzene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
1,4-Dichlorobenzene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
2-Butanone (MEK)	5	UJ	4600	UJ	17000	U	5.5	UJ	5.9	UJ	4.6	UJ	5.3	UJ	4.7	UJ
2-Chloroethylvinylether	6.2	U	1200	U	4300	U	6.9	U	7.3	U	5.8	U	6.6	U	5.9	U
2-Hexanone	6.2	U	4600	UJ	17000	UJ	6.9	U	7.3	U	5.8	U	6.6	U	5.9	U
4-Methyl-2-pentanone (MIBK)	2.5	U	4600	UJ	17000	UJ	**34**		3	U	2.3	U	2.7	U	2.4	U
Acetone	13	UJ	980	UJ	3500	UJ	23	UJ	18	UJ	16	UJ	14	UJ	19	UJ
Acrolein	130	UJ	4600	UJ	17000	UJ	140	UJ	150	UJ	120	UJ	140	UJ	120	UJ
Acrylonitrile	2.5	U	4600	U	17000	U	2.8	U	3	U	2.3	U	2.7	U	2.4	U
Benzene	1.3	U	**1500**		**23000**		**2.1**		1.5	U	1.2	U	1.4	U	1.2	U
Bromochloromethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Bromodichloromethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Bromoform	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Bromomethane	3.1	U	120	U	430	U	3.5	U	3.7	U	2.9	U	3.3	U	3	U
Carbon disulfide	**0.33**	**J**	120	U	430	U	**0.26**	**J**	1.5	U	1.2	U	1.4	U	1.2	U
Carbon tetrachloride	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Chlorobenzene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Chloroethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Chloroform	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Chloromethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
cis-1,2-Dichloroethene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
cis-1,3-Dichloropropene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Dibromochloromethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Dibromomethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U

Table 1.4
Phase 2 Soil Analytical Data

Location ID	GS-C5		GS-C7		GS-C7		GS-C7		GS-D2		GS-D2		GS-D4		GS-D4	
Sample ID	GS-C5-S-(13-15)		GS-C7-S-(0-2)		GS-C7-S-(5-7)		GS-C7-S-(13-15)		GS-D2-S-(0-2)		GS-D2-S-(5-7)		GS-D4-S-(0-2)		GS-D4-S-(5-7)	
Sample Date	9/20/2007		9/19/2007		9/19/2007		9/19/2007		9/20/2007		9/20/2007		9/20/2007		9/20/2007	
Depth Below Mudline	13 to 15		0 to 2		5 to 7		13 to 15		0 to 2		5 to 7		0 to 2		5 to 7	
Sample Elevation	-55.5 to -57.5		-38.4 to -40.4		-43.4 to -45.4		-51.4 to -53.4		-44.3 to -46.3		-49.3 to -51.3		-45.1 to -47.1		-50.1 to -52.1	
Sample Matrix	Soil		Soil		Soil		Soil		Soil		Soil		Soil		Soil	
Dichlorodifluoromethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Dichloromethane	6.2	U	**47**	**J**	1700	U	6.9	U	7.3	U	5.8	U	6.6	U	5.9	U
Ethylbenzene	1.3	U	**5600**		**65000**		**6.5**		1.5	U	1.2	U	1.4	U	1.2	U
Hexachlorobutadiene	2.5	U	460	U	1700	U	2.8	U	3	U	2.3	U	2.7	U	2.4	U
Iodomethane	13	U	1200	U	4300	U	14	U	15	U	12	UJ	14	U	12	U
Isopropylbenzene	1.3	U	**480**		**5300**		**0.52**	**J**	1.5	U	1.2	U	1.4	U	1.2	U
m,p-Xylenes	1.3	U	**2900**		**30000**		**2.6**		1.5	U	1.2	U	1.4	U	1.2	U
Methyltert-butylether	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Naphthalene	1.3	U	**180000**	**J**	**810000**	**J**	**940**	**J**	**22**		1.2	U	1.4	U	1.2	U
o-Xylene	1.3	U	**1700**		**18000**		**2.3**		1.5	U	1.2	U	1.4	U	1.2	U
Styrene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Tetrachloroethene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Toluene	**0.83**	**J**	**45**	**J**	**420**	**J**	**2.2**		**0.39**	**J**	**0.29**	**J**	**0.43**	**J**	**0.21**	**J**
trans-1,2-Dichloroethene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
trans-1,3-Dichloropropene	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
trans-1,4-Dichloro-2-butene	2.5	U	2300	U	8500	U	2.8	U	3	U	2.3	U	2.7	U	2.4	U
Trichloroethene	1.3	U	120	U	430	U	1.4	U	**0.51**	**J**	1.2	U	1.4	U	1.2	U
Trichlorofluoromethane	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U
Vinyl acetate	1.3	UJ	1200	U	4300	UJ	1.4	UJ	1.5	UJ	1.2	UJ	1.4	UJ	1.2	UJ
Vinyl chloride	1.3	U	120	U	430	U	1.4	U	1.5	U	1.2	U	1.4	U	1.2	U

Table 1.5
Tar and DNAPL Field Screening Summary
Groundwater Source Control Boring Installation

Boring Number	Bagged Core Interval (feet bgs) or (feet bml)	HAI Post-Boring Installation Screening Results									
		Visual and Olfactory Methods						DNAPL Screening Methods			
		Odor[2]	Sheen	Visual Oil Blebs or Patchy Oil	Visual Oil Saturation	Visual Patchy Soil-Mixed Tar	Visual Tar	Ultraviolet Light Box	Sudan Dye Shake Kit	Sudan Dye Lens Spray	NAPL Dye Liner Strip
GS-B2	0 - 2	**strong**	**yes**	no	no	no	no	**positive**	-	-	-
	2 - 4	**mild**	**yes**	no	no	no	no	**positive**	-	-	-
	4 - 6	**strong**	**yes**	no	no	no	no	**positive**	-	-	-
	6 - 8	**mild**	no	no	no	no	no	**positive**	-	-	-
	8 - 10	**mild**	no	no	no	no	no	**positive**	-	-	-
	10 - 15 [1]	**mild**	no	no	no	no	no	-	-	-	-
GS-B5	0 - 2	**strong**	no	no	no	no	no	**positive**	-	-	-
	2 - 4	**moderate**	no	no	no	no	no	**positive**	-	-	-
	4 - 6	**moderate**	no	no	no	no	no	**positive**	-	-	-
	6 - 8	**mild**	no	no	no	no	no	**positive**	-	-	-
	8 - 10	**mild**	no	no	no	no	no	**positive**	-	-	-
	10 - 15 [1]	**mild**	**yes**	no	no	no	no	-	-	-	-
GS-B7	0 - 2	no	no	no	no	no	no	negative	-	-	-
	2 - 4	**mild**	**yes**	no	no	no	no	**positive-patchy**	-	-	-
	4 - 6	**mild**	**yes**	no	**yes**	no	no	**positive**	-	-	-
	6 - 8	**strong**	**yes**	no	**yes**	no	no	**positive**	-	-	-
	8 - 10 [1]	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
	10 - 15 [1]	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
GS-C2	0 - 2	**strong**	**yes**	**yes**	no	no	no	**positive**	-	-	-
	2 - 4	**moderate**	**yes**	no	no	no	no	**positive**	-	-	-
	4 - 6	**mild**	**yes**	no	no	no	no	**positive**	-	-	-
	6 - 8	**mild**	**yes**	no	no	no	no	negative	-	-	-
	8 - 10	**mild**	**yes**	no	no	no	no	negative	-	-	-
GS-C5	0 - 2	no	no	no	no	no	no	negative	-	-	-
	2 - 4	no	no	no	no	no	no	negative	-	-	-
	4 - 6	**mild**	**yes**	no	no	no	no	negative	-	-	-
	6 - 8	no	no	no	no	no	no	negative	-	-	-
	8 - 10	no	no	no	no	no	no	negative	-	-	-
	10 - 15 [1]	no	no	no	no	no	no	-	-	-	-
GS-C7 [1]	0 - 2	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
	2 - 4	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
	4 - 6	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
	6 - 8	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
	8 - 10	**strong**	**yes**	no	**yes**	no	no	-	-	-	-
	10 - 15	no	no	no	no	no	no	-	-	-	-
GS-D2 [1]	0 - 2	no	no	no	no	no	no	-	-	-	-
	2 - 4	no	no	no	no	no	no	-	-	-	-
	4 - 6	no	no	no	no	no	no	-	-	-	-
	6 - 8	no	no	no	no	no	no	-	-	-	-
	8 - 10	no	no	no	no	no	no	negative	-	-	-
GS-D4	0 - 2	no	no	no	no	no	no	negative	-	-	-
	2 - 4	no	no	no	no	no	no	negative	-	-	-
	4 - 6	no	no	no	no	no	no	negative	-	-	-
	6 - 8	no	no	no	no	no	no	negative	-	-	-
	8 - 10	no	no	no	no	no	no	negative	-	-	

Notes:
1 = Field screened by Anchor Environmental L.L.C.
- = Not tested

Table 1.6
Groundwater Dioxin/Furan Data

Location ID	GS-B7		GS-C7	
Sample ID	GS-B7-W-125		GS-C7-W-100	
Sample Date	8/29/2007		9/4/2007	
Depth Below Mudline	123 to 127		98 to 102	
Sample Elevation	-151.9 to -155.9		-136.2 to -140.2	
Dioxins/Furans (pg/l)				
1,2,3,4,6,7,8-HpCDD	**652**		**378**	
1,2,3,4,6,7,8-HpCDF	**141**		**29.4**	
1,2,3,4,7,8,9-HpCDF	**51.2**		**7.02**	**J**
1,2,3,4,7,8-HxCDD	**2.52**	**J**	**0.834**	**J**
1,2,3,4,7,8-HxCDF	**225**	**J**	**23**	**J**
1,2,3,6,7,8-HxCDD	**16.4**	**J**	**5.51**	**J**
1,2,3,6,7,8-HxCDF	**55.7**	**J**	**6.11**	**J**
1,2,3,7,8,9-HxCDD	**4.44**	**J**	**4.26**	**J**
1,2,3,7,8,9-HxCDF	**3.44**	**J**	**0.347**	**J**
1,2,3,7,8-PeCDD	**2.26**	**J**	25	U
1,2,3,7,8-PeCDF	**148**		**13.5**	**J**
2,3,4,6,7,8-HxCDF	**11.5**	**J**	**1.27**	**J**
2,3,4,7,8-PeCDF	**61**		**4.62**	**J**
2,3,7,8-TCDD	10.2	U	10	U
2,3,7,8-TCDF	**108**		**7.46**	**J**
OCDD	**5490**		**2750**	**J**
OCDF	**500**		**153**	**J**
Total HpCDD	**1500**		**887**	
Total HpCDF	**422**		**115**	
Total HxCDD	**144**	**J**	**75.8**	
Total HxCDF	**436**	**J**	**54.6**	
Total PeCDD	**11.5**	**J**	25	U
Total PeCDF	**355**		**37**	
Total TCDD	**16.7**		10	U
Total TCDF	**328**		**23.1**	
Herbicides (ug/L)				
2,2-Dichloropropionic acid	2.1	U	2	U
2,4,5-T	1.1	U	1	U
2,4-D	2.1	UJ	2	UJ
2,4-DB	2.1	U	2	U
Dicamba	1.1	U	1	U
Dichloroprop	2.1	U	2	U
Dinoseb	1.1	U	1	U
MCPA	520	U	500	U
MCPP	520	U	500	U
Silvex	1.1	UJ	1	UJ

Table 2.1
TZW Tidal Influence Sample Collection Information

Station	Sample ID	Date	Time	Station Locations[a]		Tide Condition	Tide Elevation (ft COP)	Sample Media	Sample Description
GS-B7	GS-B7PWE-071004	10/4/2007	18:10	45.57942072	-122.7560316	Ebb	5.38	Porewater	Yellowish turbidity, slight sheen, chlorinated solvent odor
	GS-B7PWE-071005	10/5/2007	9:00	45.57942072	-122.7560316	Ebb	4.92	Porewater	Yellowish color, marine and chlorinated solvent smell
	GS-B7PWSL-071005	10/5/2007	11:15	45.57942072	-122.7560316	Slack Low	4.63	Porewater	Yellowish turbidity (108.0 NTU), chlorinated solvent odor
	GS-B7SWSL-071005	10/5/2007	11:15	45.57942072	-122.7560316	Slack Low	4.63	Discrete Near-Bottom Surface Water	--
	GS-B7PWSH-071005	10/5/2007	15:30	45.57942072	-122.7560316	Slack High	6.6	Porewater	Slight tubidity, orange color, chlorinated solvent odor
	GS-B7SWSH-071005	10/5/2007	15:30	45.57942072	-122.7560316	Slack High	6.6	Discrete Near-Bottom Surface Water	No color/odor
	GS-B7PWSL-071006	10/6/2007	12:50	45.57942072	-122.7560316	Slack Low	3.72	Porewater	Slight mothball odor
	GS-B7SWSL-071006	10/6/2007	12:50	45.57942072	-122.7560316	Slack Low	3.72	Discrete Near-Bottom Surface Water	--
GS-C7	GS-C7SWSL-071004	10/4/2007	11:00	45.57976939	-122.7557407	Slack Low	5.02	Discrete Near-Bottom Surface Water	--
	GS-C7PWSL-071004	10/4/2007	11:30	45.57976939	-122.7557407	Slack Low	5.02	Porewater	Very slight turbidiy, heavy sheen, strong mothball odor, blebs of oil throughout collection
	GS-C7PWSH-071004	10/4/2007	13:10	45.57976939	-122.7557407	Slack High	6.34	Porewater	Slight turbidity, hydrocarbon odor, heavy sheen
	GS-C7SWSH-071004	10/4/2007	13:10	45.57976939	-122.7557407	Slack High	6.34	Discrete Near-Bottom Surface Water	--
	GS-C7PWE-071004	10/4/2007	16:10	45.57976939	-122.7557407	Ebb	5.8	Porewater	Some turbidity, heavy sheen, strong odor
	GS-C7PWE-071005	10/5/2007	7:30	45.57976939	-122.7557407	Ebb	5.36	Porewater	Yellow-orange color, heavy sheen, strong hydrocarnob odor, black pieces of tar
	GS-C7PWSL-071005	10/5/2007	10:00	45.57976939	-122.7557407	Slack Low	4.65	Porewater	Orange-yellow turbidity (41.9 NTU), heavy sheen, strong hydrocarbon odor
	GS-C7SWSL-071005	10/5/2007	10:00	45.57976939	-122.7557407	Slack Low	4.65	Discrete Near-Bottom Surface Water	--
	GS-C7PWSH-071005	10/5/2007	14:15	45.57976939	-122.7557407	Slack High	6.56	Porewater	Some turbidity (57.8 NTU), thick oily sheen, strong hydrocarbon odor
	GS-C7SWSH-071005	10/5/2007	14:15	45.57976939	-122.7557407	Slack High	6.56	Discrete Near-Bottom Surface Water	No color/odor
	GS-C7PWSL-071006	10/6/2007	11:15	45.57976939	-122.7557407	Slack Low	3.36	Porewater	Heavy sheen, strong odor, dark black tar blebs
	GS-C7SWSL-071006	10/6/2007	11:15	45.57976939	-122.7557407	Slack Low	3.36	Discrete Near-Bottom Surface Water	--
GS-D5	GS-D5PWSH-071004	10/4/2007	14:10	45.58004083	-122.7546302	Slack High	6.48	Porewater	Slight turbidity, slight sheen
	GS-D5SWSH-071004	10/4/2007	14:20	45.58004083	-122.7546302	Slack High	6.48	Discrete Near-Bottom Surface Water	Slight turbidity, no color/odor
	GS-D5PWE-071004	10/4/2007	16:45	45.58004083	-122.7546302	Ebb	5.67	Porewater	Yellowish turbidity, slight sheen, slight odor
	GS-D5PWE-071005	10/5/2007	8:05	45.58004083	-122.7546302	Ebb	5.2	Porewater	Slight yellowish turbidity, hydrocarbon odor
	GS-D5PWSL-071005	10/5/2007	10:35	45.58004083	-122.7546302	Slack Low	4.57	Porewater	Yellowish-brown turbidity (8.1 NTU), slight hydrocarbon odor
	GS-D5SWSL-071005	10/5/2007	10:35	45.58004083	-122.7546302	Slack Low	4.57	Discrete Near-Bottom Surface Water	--
	GS-D5PWSH-071005	10/5/2007	15:00	45.58004083	-122.7546302	Slack High	6.73	Porewater	Yellowish turbidity (7.86 NTU), slight hydrocarbon odor
	GS-D5SWSH-071005	10/5/2007	15:00	45.58004083	-122.7546302	Slack High	6.73	Discrete Near-Bottom Surface Water	Clear, odorless
	GS-D5PWSL-071006	10/6/2007	11:50	45.58004083	-122.7546302	Slack Low	3.36	Porewater	Clear, slight odor,
	GS-D5SWSL-071006	10/6/2007	11:50	45.58004083	-122.7546302	Slack Low	3.36	Discrete Near-Bottom Surface Water	--

Notes:

[a] Station locations provided in latitude/longitude North American Datum (NAD 83) in decimal degrees format. All stations were on target with the proposed station coordinates.

COP - City of Portland Datum

Table 2.2
Bulk Sediment Sample Collection Information

Stations	Date	Sample ID	Station Locations[a]		Offset Location Information[b]	Penetration Depth (ft)	Sample Interval (ft)
GS-B7	10/11/2007	GS-B7SC-071011	45.57942072	-122.7560316	4.5 feet from piezometer	1.3	0.8 - 1.3
GS-C7	10/11/2007	GS-C7SC-071011	45.57976939	-122.7557407	--	1.9	1.4 - 1.9
GS-D5	10/11/2007	GS-D5SC-071011	45.58004083	-122.7546302	Channel side of piezometer	2.25	1.5 - 2.0

Notes:

[a] Station locations provided in latitude/longitude North American Datum (NAD 83) in decimal degrees format. All stations were on target with the proposed station coordinates.

[b] Diver offset tation locations provided in latitude/longitude North American Datum (NAD 83) in decimal degrees format. All stations were on target with the proposed station coordinates.

Table 2.3
Transition Zone Water Tidal Influence Analytical Results

Sample Station	GS-B7		GS-B7		GS-B7		GS-B7		GS-B7		GS-C7		GS-C7		GS-C7		GS-C7	
Sample ID	GS-B7PWE-071004		GS-B7PWE-071005		GS-B7PWSH-071005		GS-B7PWSL-071005		GS-B7PWSL-071006		GS-C7PWE-071004		GS-C7PWE-071005		GS-C7PWSH-071004		GS-C7PWSH-071005	
Sample Date	10/4/07		10/5/07		10/5/07		10/5/07		10/6/07		10/4/07		10/5/07		10/4/07		10/5/07	
Tide Condition	Ebb		Ebb		Slack High		Slack Low		Slack Low		Ebb		Ebb		Slack High		Slack High	
Conventionals (mg/L)																		
Alkalinity, Total (mg/L)	--		--		--		--		--		**324**		**322**		**156**		**270**	
Amenable Cyanide (mg/L)	--		--		--		--		--		**0.01**	**R**	0.01	U	**0.01**	**R**	0.01	U
Chloride (mg/L)	--		--		--		--		--		**5.8**		**6.9**		**4.8**		**6.1**	
Cyanide, Total (mg/L)	--		--		--		--		--		**0.31**		**0.42**		**0.24**		**0.32**	
Dissolved organic carbon (mg/L)	--		--		--		--		--		**12.9**		**15**		**5.8**		**14**	
Free Cyanide (ug/L)	--		--		--		--		--		10	U	10	U	10	U	10	U
Sulfate (mg/L)	--		--		--		--		--		**1.8**		**0.4**		**3.2**		**1.7**	
Sulfide (mg/L)	--		--		--		--		--		0.05	UJ	**0.014**	**J**	0.05	UJ	**0.027**	**J**
Total organic carbon (mg/L)	--		--		--		--		--		**19.6**		**19.5**		**11.4**		**18**	
Metals (ug/L)																		
Calcium	**59100**		**55600**		**54600**		**52100**		**57400**		**54000**		**54700**		**49900**		**60900**	
Iron	**47300**		**48600**		**42300**		**39100**		**43300**		**39500**		**40100**		**35900**		**48000**	
Magnesium	**19500**		**18900**		**18700**		**17500**		**18700**		**18900**		**19800**		**17500**		**22500**	
Manganese	**5370**		**5210**		**5210**		**4870**		**5280**		**2420**		**2600**		**2210**		**2910**	
Potassium	**2990**		**3860**		**3860**		**3640**		**3770**		**3230**		**3760**		**3650**		**4180**	
Sodium	**12900**		**13300**		**13200**		**12800**		**12300**		**12200**		**13300**		**11900**		**14300**	
PAHs (ug/L)																		
2-Methylnaphthalene	--		--		--		--		--		**570**		**660**		**520**		**770**	
Acenaphthene	--		--		--		--		--		**340**		**370**		**320**		**510**	
Acenaphthylene	--		--		--		--		--		**4.5**		**3.6**		**3.5**		**12**	
Anthracene	--		--		--		--		--		**36**		**31**		**30**		**91**	
Benzo(a)anthracene	--		--		--		--		--		**15**		**11**		**12**		**52**	
Benzo(a)pyrene	--		--		--		--		--		**18**		**13**		**14**		**66**	
Benzo(b)fluoranthene	--		--		--		--		--		**16**		**11**		**12**		**57**	
Benzo(g,h,i)perylene	--		--		--		--		--		**14**		**9.5**		**11**		**49**	
Benzo(k)fluoranthene	--		--		--		--		--		**5.4**		**3.5**		**3.7**		**18**	
Chrysene	--		--		--		--		--		**18**		**13**		**15**		**64**	
Dibenzo(a,h)anthracene	--		--		--		--		--		**1.9**		**1.3**		**1.5**		**5.6**	
Dibenzofuran	--		--		--		--		--		**17**		**18**		**15**		**28**	
Fluoranthene	--		--		--		--		--		**75**		**55**		**61**		**250**	
Fluorene	--		--		--		--		--		**82**		**79**		**71**		**150**	
Indeno(1,2,3-cd)pyrene	--		--		--		--		--		**13**		**8.9**		**10**		**47**	
Naphthalene	--				--		--		--		**11000**		**14000**		**9500**		**12000**	
Phenanthrene	--		--		--		--		--		**280**		**240**		**270**		**570**	
Pyrene	--		--		--		--		--		**77**		**58**		**64**		**250**	
VOC (ug/L)																		
1,1,1,2-Tetrachloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,1,1-Trichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,1,2,2-Tetrachloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,1,2-Trichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,1-Dichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,1-Dichloroethene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,2,3-Trichloropropane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,2,4-Trichlorobenzene	2	U	2	UJ	2	U	2	U	2	U	200	U	400	U	200	U	200	UJ
1,2-Dibromoethane	2	U	2	UJ	2	U	2	U	2	U	200	U	400	U	200	U	200	UJ
1,2-Dichlorobenzene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,2-Dichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,2-Dichloropropane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
1,3-Dichlorobenzene	**2.6**		**1.1**	**J**	**0.77**		**2.5**		**0.76**		50	U	100	U	50	U	50	UJ
1,4-Dichlorobenzene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
2-Butanone (MEK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	2000	UJ	4000	UJ	2000	UJ	2000	UJ

Table 2.3
Transition Zone Water Tidal Influence Analytical Results

Sample Station	GS-B7		GS-B7		GS-B7		GS-B7		GS-B7		GS-C7		GS-C7		GS-C7		GS-C7	
Sample ID	GS-B7PWE-071004		GS-B7PWE-071005		GS-B7PWSH-071005		GS-B7PWSL-071005		GS-B7PWSL-071006		GS-C7PWE-071004		GS-C7PWE-071005		GS-C7PWSH-071004		GS-C7PWSH-071005	
Sample Date	10/4/07		10/5/07		10/5/07		10/5/07		10/6/07		10/4/07		10/5/07		10/4/07		10/5/07	
Tide Condition	Ebb		Ebb		Slack High		Slack Low		Slack Low		Ebb		Ebb		Slack High		Slack High	
2-Chloroethylvinylether	5	U	5	UJ	5	U	5	U	5	UJ	500	U	1000	U	500	U	500	UJ
2-Hexanone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	2000	UJ	4000	UJ	2000	UJ	2000	UJ
4-Methyl-2-pentanone (MIBK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	2000	UJ	4000	UJ	2000	UJ	2000	UJ
Acetone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	2000	UJ	4000	UJ	2000	UJ	2000	UJ
Acrolein	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	2000	UJ	4000	UJ	2000	UJ	2000	UJ
Acrylonitrile	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	500	UJ	1000	UJ	500	UJ	500	UJ
Benzene	**0.19**	**J**	**0.24**	**J**	**0.24**	**J**	**0.19**	**J**	**0.36**	**J**	**3000**		**4800**		**2300**		**3100**	**J**
Bromochloromethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Bromodichloromethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Bromoform	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Bromomethane	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	50	UJ	100	UJ	50	UJ	50	UJ
Carbon disulfide	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Carbon tetrachloride	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Chlorobenzene	0.5	U	**0.2**	**J**	**0.2**	**J**	0.5	U	**0.15**	**J**	50	U	100	U	50	U	50	UJ
Chloroethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Chloroform	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Chloromethane	0.5	U	**0.21**	**J**	0.5	U	**0.15**	**J**	**0.22**	**J**	50	U	100	U	50	U	50	UJ
cis-1,3-Dichloropropene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Dibromochloromethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Dibromomethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Dichlorodifluoromethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Ethylbenzene	**0.43**	**J**	**0.55**	**J**	**0.6**		**0.36**	**J**	**0.48**	**J**	**460**		**690**		**360**		**470**	**J**
Hexachlorobutadiene	2	U	2	UJ	2	U	2	U	2	U	200	U	400	U	200	U	200	UJ
Iodomethane	5	U	5	UJ	5	U	5	U	5	U	500	U	1000	U	500	U	500	UJ
Isopropylbenzene	**2**		**3.9**	**J**	**3.6**		**1.5**	**J**	**2.4**		**15**	**J**	**22**	**J**	**13**	**J**	**14**	**J**
m,p-Xylene	**0.69**		**0.65**	**J**	**0.64**		**0.53**		**0.71**		**250**		**380**		**210**		**260**	**J**
Methylene chloride	2	U	2	UJ	2	U	2	U	2	U	**66**	**J**	**52**	**J**	**49**	**J**	**64**	**J**
Methyltert-butylether	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Naphthalene	**7.2**		**15**	**J**	**19**		**10**		**17**		**19000**		**17000**		**15000**		**17000**	**J**
o-Xylene	**0.56**		**0.75**	**J**	**0.78**		**0.46**	**J**	**0.66**		**140**		**210**		**110**		**140**	**J**
Styrene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Tetrachloroethene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Toluene	**2.6**		**1.1**	**J**	**0.82**		**1.2**		**1.2**		**28**	**J**	**38**	**J**	**21**	**J**	**94**	**J**
trans-1,2-Dichloroethene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
trans-1,3-Dichloropropene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
trans-1,4-Dichloro-2-butene	10	U	10	UJ	10	U	10	U	10	UJ	1000	U	2000	U	1000	U	1000	UJ
Trichloroethene	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ
Trichlorofluoromethane	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	UJ	50	U	100	U	50	U	50	UJ
Vinyl acetate	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	500	UJ	1000	UJ	500	UJ	500	UJ
Vinyl chloride	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	50	U	100	U	50	U	50	UJ

Table 2.3
Transition Zone Water Tidal Influence Analytical Results

Sample Station	GS-C7		GS-C7		GS-C7		GS-D5		GS-D5		GS-D5		GS-D5		GS-D5		GS-D5	
Sample ID	GS-C7PWSL-071004		GS-C7PWSL-071005		GS-C7PWSL-071006		GS-D5PWE-071004		GS-D5PWE-071005		GS-D5PWSH-071004		GS-D5PWSH-071005		GS-D5PWSL-071005		GS-D5PWSL-071006	
Sample Date	10/4/07		10/5/07		10/6/07		10/4/07		10/5/07		10/4/07		10/5/07		10/5/07		10/6/07	
Tide Condition	Slack Low		Slack Low		Slack Low		Ebb		Ebb		Slack High		Slack High		Slack Low		Slack Low	
Conventionals (mg/L)																		
Alkalinity, Total (mg/L)	225		354		354		400		383		502		374		382		372	
Amenable Cyanide (mg/L)	0.01	R	0.07		0.01	UJ	0.01	R	0.01	U	0.01	R	0.01	U	0.01	U	0.004	J
Chloride (mg/L)	5.4		6.9		6.9		25.9		24		30.1		21.2		22.6		20.7	
Cyanide, Total (mg/L)	0.26		0.42		0.47		0.009	J	0.01	U	0.06		0.01	U	0.01	U	0.004	J
Dissolved organic carbon (mg/L)	9.8		16.4		16		7.1		7.4		7		6.7		6.9		6.6	
Free Cyanide (ug/L)	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Sulfate (mg/L)	2.4		0.5		0.8		0.3		0.4		0.12	J	0.7		0.6		0.9	
Sulfide (mg/L)	0.12	J	0.027	J	0.07		0.05	UJ	0.05	U	0.05	UJ	0.05	U	0.05	U	0.05	U
Total organic carbon (mg/L)	21.1		19.5		18		15.3		14.5		13.9		13.9		14.7		13.1	
Metals (ug/L)																		
Calcium	47400		58700		50900		97600		95100		107000		90600		93300		92700	
Iron	37200		43200		37200		63400		59300		72000		55800		57700		55500	
Magnesium	17000		21200		17900		31000		29900		33800		28800		29900		30200	
Manganese	2130		2790		2290		10100		9570		10200		9160		9340		9930	
Potassium	2900		3950		2790		5070		5260		5550		5030		5220		4810	
Sodium	11300		13900		12000		17400		18400		18800		17600		18200		16700	
PAHs (ug/L)																		
2-Methylnaphthalene	1000		670		510		0.0078	J	0.0091	J	0.014	J	0.0097	J	0.0078	J	0.021	
Acenaphthene	680		360		290		9.5		11		9.2		9.2		9.6		11	
Acenaphthylene	12		4.9		2.4		0.026		0.029		0.023		0.027		0.029		0.036	
Anthracene	97		40		21		0.051		0.06		0.044		0.06		0.061		0.099	
Benzo(a)anthracene	59		16		5.4		0.02	U	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
Benzo(a)pyrene	75		20		6.1		0.0087	J	0.019	U	0.02	U	0.019	U	0.019	U	0.0064	J
Benzo(b)fluoranthene	65		18		5.3		0.014	J	0.019	U	0.02	U	0.019	U	0.019	U	0.0081	J
Benzo(g,h,i)perylene	54		15		4.6		0.014	J	0.019	U	0.02	U	0.019	U	0.019	U	0.0041	J
Benzo(k)fluoranthene	20		5.5		1.6		0.0065	J	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
Chrysene	70		20		7.3		0.0064	J	0.0047	J	0.004	J	0.0036	J	0.0044	J	0.017	J
Dibenzo(a,h)anthracene	6.7		2.1		0.59		0.0065	J	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
Dibenzofuran	33		19		16		0.013	J	0.016	J	0.012	J	0.018	J	0.018	J	0.025	
Fluoranthene	310		82		33		0.11		0.13		0.1		0.12		0.13		0.16	
Fluorene	170		89		70		1.8		2		1.6		1.9		1.9		2.4	
Indeno(1,2,3-cd)pyrene	53		15		4.3		0.018	J	0.019	U	0.02	U	0.019	U	0.019	U	0.0037	J
Naphthalene	15000		12000		12000		0.036	U	0.045	U	0.11		0.042	U	0.037	U	0.068	
Phenanthrene	790		270		160		1.1		1.2		0.99		1.1		1.2		1.6	
Pyrene	310		84		34		0.078		0.085		0.071		0.084		0.086		0.15	
VOC (ug/L)																		
1,1,1,2-Tetrachloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1,1-Trichloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1,2,2-Tetrachloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1,2-Trichloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1-Dichloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1-Dichloroethene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2,3-Trichloropropane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2,4-Trichlorobenzene	200	U	400	U	100	U	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
1,2-Dibromoethane	200	U	400	U	100	U	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
1,2-Dichlorobenzene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2-Dichloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2-Dichloropropane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,3-Dichlorobenzene	50	U	100	U	25	U	0.32	J	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.14	J
1,4-Dichlorobenzene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
2-Butanone (MEK)	2000	UJ	4000	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ

Table 2.3
Transition Zone Water Tidal Influence Analytical Results

Sample Station	GS-C7		GS-C7		GS-C7		GS-D5		GS-D5		GS-D5		GS-D5		GS-D5		GS-D5	
Sample ID	GS-C7PWSL-071004		GS-C7PWSL-071005		GS-C7PWSL-071006		GS-D5PWE-071004		GS-D5PWE-071005		GS-D5PWSH-071004		GS-D5PWSH-071005		GS-D5PWSL-071005		GS-D5PWSL-071006	
Sample Date	10/4/07		10/5/07		10/6/07		10/4/07		10/5/07		10/4/07		10/5/07		10/5/07		10/6/07	
Tide Condition	Slack Low		Slack Low		Slack Low		Ebb		Ebb		Slack High		Slack High		Slack Low		Slack Low	
2-Chloroethylvinylether	500	U	1000	U	250	UJ	5	U	5	UJ	5	U	5	UJ	5	UJ	5	UJ
2-Hexanone	2000	UJ	4000	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	UJ	4000	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	2000	UJ	4000	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	2000	UJ	4000	UJ	1000	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	500	UJ	1000	UJ	250	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	**2700**		**4400**		**4500**		0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromochloromethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromodichloromethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromoform	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromomethane	50	UJ	100	UJ	25	U	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U
Carbon disulfide	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Carbon tetrachloride	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chlorobenzene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chloroethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chloroform	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chloromethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
cis-1,3-Dichloropropene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Dibromochloromethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Dibromomethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Dichlorodifluoromethane	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Ethylbenzene	**420**		**630**		**660**		0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Hexachlorobutadiene	200	U	400	U	100	U	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
Iodomethane	500	U	1000	U	250	U	5	U	5	UJ	5	U	5	UJ	5	UJ	5	U
Isopropylbenzene	**14**	**J**	400	U	**18**	**J**	2	U	2	UJ	2	U	2	UJ	2	UJ	**0.11**	**J**
m,p-Xylene	**240**		**350**		**350**		0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Methylene chloride	**41**	**J**	**50**	**J**	**15**	**J**	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
Methyltert-butylether	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Naphthalene	**13000**		**19000**		**17000**		2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
o-Xylene	**130**		**190**		**210**		0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Styrene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Tetrachloroethene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Toluene	**26**	**J**	**42**	**J**	**40**		**0.75**		**0.78**	**J**	0.5	U	0.5	UJ	**1.1**	**J**	**0.2**	**J**
trans-1,2-Dichloroethene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
trans-1,3-Dichloropropene	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
trans-1,4-Dichloro-2-butene	1000	U	2000	U	500	UJ	10	U	10	UJ	10	U	10	UJ	10	UJ	10	UJ
Trichloroethene	50	U	100	U	25	U	**0.16**	**J**	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Trichlorofluoromethane	50	U	100	U	25	UJ	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ
Vinyl acetate	500	UJ	1000	UJ	250	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	50	U	100	U	25	U	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U

Notes:

Bold	detected results
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
U	The analyte was analyzed for, but not detected above the sample reporting limit.
UJ	The analyte was not detected above the sample reporting limit. However, the sample reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The result was rejected due to analysis of the sample beyond two times the holding time (14 days)
mg/L	milligrams per liter
µg/L	mircograms per liter

Table 2.4
Co-Located Tidal Influence Bulk Sediment Analytical Results

Sample Station Sample ID Sample Date	GS-B7 GS-B7SC-071011 10/11/07		GS-C7 GS-C7SC-071011 10/11/07		GS-D5 GS-D5SC-071011 10/11/07	
Conventionals (mg/kg)						
Cyanide (mg/kg)	**1.49**		**1.56**		0.35	U
Sulfide (mg/kg)	**15.7**		**2.2**		**3.05**	
Total organic carbon (%)	**3.31**	**J**	**9.74**	**J**	**0.66**	**J**
Total solids (%)	**65.1**		**70.6**		**67.9**	
Grain Size (%)						
Clay	**7.81**		**3.13**		**7.84**	
Gravel, Fine	**1.19**		**4.1**		**0.33**	
Gravel, Medium	**21.9**		**4.07**		**0.19**	
Sand, Coarse	**2.4**		**27.8**		**8.31**	
Sand, Fine	**14.1**		**8.35**		**7.89**	
Sand, Medium	**5.18**		**29.5**		**51.3**	
Sand, Very Coarse	**1.38**		**8.15**		**1.08**	
Sand, Very Fine	**5.46**		**0.89**		**1.05**	
Silt	**34.4**		**10.1**		**21.5**	
Metals (mg/kg)						
Calcium	**5210**		**3860**		**4440**	
Iron	**33700**		**23100**		**29300**	
Magnesium	**5000**		**3540**		**4560**	
Manganese	**540**		**285**		**387**	
Potassium	**792**		**518**		**614**	
Sodium	**489**	**J**	**308**	**J**	**381**	**J**
PAHs (ug/kg)						
Acenaphthene	**85000**		**970000**		**2500**	
Acenaphthylene	**2900**		**33000**		**65**	
Benzo(a)anthracene	**30000**		**230000**		**520**	
Benzo(a)pyrene	**33000**	**J**	**280000**	**J**	**630**	**J**
Benzo(b)fluoranthene	**28000**		**250000**		**570**	
Benzo(g,h,i)perylene	**25000**		**190000**		**500**	
Benzo(k)fluoranthene	**8700**		**81000**		**190**	
Chrysene	**34000**		**270000**		**760**	
Dibenzo(a,h)anthracene	**3800**		**29000**		**75**	
Fluoranthene	**100000**		**840000**		**2600**	
Fluorene	**42000**		**420000**		**1300**	
Indeno(1,2,3-cd)pyrene	**24000**		**190000**		**470**	
Naphthalene	**2700**	**J**	**4300000**	**J**	**170**	**J**
Phenanthrene	**230000**		**1900000**		**6900**	
Pyrene	**120000**		**930000**		**3000**	
VOC (ug/kg)						
1,1,1,2-Tetrachloroethane	1.6	U	15000	U	1.3	U
1,1,1-Trichloroethane	1.6	U	15000	U	1.3	U
1,1,2,2-Tetrachloroethane	1.6	U	15000	U	1.3	U
1,1,2-Trichloroethane	1.6	U	15000	U	1.3	U

Table 2.4
Co-Located Tidal Influence Bulk Sediment Analytical Results

Sample Station Sample ID Sample Date	GS-B7 GS-B7SC-071011 10/11/07		GS-C7 GS-C7SC-071011 10/11/07		GS-D5 GS-D5SC-071011 10/11/07	
1,1-Dichloroethane	1.6	U	15000	U	1.3	U
1,1-Dichloroethene	1.6	U	15000	U	1.3	U
1,2,3-Trichloropropane	1.6	U	15000	U	1.3	U
1,2-Dibromoethane	1.6	U	57000	U	1.3	U
1,2-Dichloroethane	1.6	U	15000	U	1.3	U
1,2-Dichloropropane	1.6	U	15000	U	1.3	U
1,4-Dichlorobenzene	1.6	U	15000	U	1.3	U
2-Butanone (MEK)	**7.3**	**J**	**120000**	**J**	**5.6**	**J**
2-Chloroethylvinylether	3.1	U	150,000	U	2.5	U
2-Hexanone	7.7	U	570,000	UJ	6.2	U
2-Methylnaphthalene	**46000**	**J**	**1000000**	**J**	**130**	**J**
4-Methyl-2-pentanone (MIBK)	3.1	UJ	570000	UJ	2.5	U
Acetone	16	UJ	570	UJ	13	UJ
Acrolein	9.6	UJ	570	UJ	7.8	UJ
Acrylonitrile	3.1	U	570000	UJ	2.5	U
Anthracene	**45000**	**J**	**410000**	**J**	**920**	**J**
Benzene	1.6	U	**18000**		1.3	U
Bromochloromethane	1.6	U	15000	U	1.3	U
Bromodichloromethane	1.6	U	15000	U	1.3	U
Bromoform	1.6	U	15000	U	1.3	U
Bromomethane	3.9	U	15000	UJ	3.1	U
Carbon disulfide	**0.73**	**J**	15000	U	1.3	U
Carbon tetrachloride	1.6	U	15000	U	1.3	U
Chlorobenzene	1.6	U	15000	U	1.3	U
Chloroethane	1.6	U	15000	U	1.3	U
Chloroform	1.6	U	15000	U	1.3	U
Chloromethane	1.6	U	15000	U	1.3	U
cis-1,3-Dichloropropene	1.6	U	15000	U	1.3	U
Dibromochloromethane	1.6	U	15000	U	1.3	U
Dibromomethane	1.6	U	15000	U	1.3	U
Dichlorodifluoromethane	1.6	U	15000	U	1.3	U
Ethylbenzene	**0.53**	**J**	**60000**		1.3	U
Hexachlorobutadiene	3.1	U	57000	U	2.5	U
Iodomethane	16	U	150000	U	13	U
Isopropylbenzene	**12**		**4200**	**J**	**1**	**J**
m,p-Xylene	**2.5**		**26000**		6.2	U
Methylene chloride	7.7	U	**7100**	**J**	**3.7**	**J**
Methyltert-butylether	1.6	U	15000	U	1.3	U
Naphthalene	**7.5**	**J**	**4300000**	**J**	1.3	UJ
o-Xylene	**2.5**		**16000**		1.3	U
Styrene	1.6	U	15000	U	1.3	U
Tetrachloroethene	1.6	U	15000	U	1.3	U
Toluene	1.6	U	**9300**	**J**	**2.6**	

Table 2.4
Co-Located Tidal Influence Bulk Sediment Analytical Results

Sample Station Sample ID Sample Date	GS-B7 GS-B7SC-071011 10/11/07		GS-C7 GS-C7SC-071011 10/11/07		GS-D5 GS-D5SC-071011 10/11/07	
trans-1,2-Dichloroethene	1.6	U	15000	U	1.3	U
trans-1,3-Dichloropropene	1.6	U	15000	U	1.3	U
trans-1,4-Dichloro-2-butene	3.1	U	290000	U	2.5	U
Trichloroethene	1.6	U	15000	U	1.3	U
Trichlorofluoromethane	1.6	U	15000	U	1.3	U
Vinyl acetate	1.6	UJ	150000	UJ	1.4	UJ
Vinyl chloride	1.6	U	15000	U	1.3	U

Notes:

Bold	detected results
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
U	The analyte was analyzed for, but not detected above the sample reporting limit.
UJ	The analyte was not detected above the sample reporting limit. However, the sample reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
mg/kg	milligrams per kilogram
µg/kg	mircograms per kilogram

Table 2.5
Co-Located Tidal Influence Near-Bottom Surface Water Analytical Results

Sample Station	GS-B7		GS-B7		GS-B7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-D5		GS-D5		GS-D5		GS-D5	
Sample ID	GS-B7SWSH-071005		GS-B7SWSL-071005		GS-B7SWSL-071006		GS-C7SWSH-071004		GS-C7SWSH-071005		GS-C7SWSL-071004		GS-C7SWSL-071005		GS-C7SWSL-071006		GS-D5SWSH-071004		GS-D5SWSH-071005		GS-D5SWSL-071005		GS-D5SWSL-071006	
Sample Date	10/5/07		10/5/07		10/6/07		10/4/07		10/5/07		10/4/07		10/5/07		10/6/07		10/4/07		10/5/07		10/5/07		10/6/07	
Tide Condition	Slack High		Slack Low		Slack Low		Slack High		Slack High		Slack Low		Slack Low		Slack Low		Slack High		Slack High		Slack Low		Slack Low	
Conventionals (mg/L)																								
Alkalinity, Total	**34**		**30**		**22**		**34**		**27**		**22**		**23**		**25**		**24**		**32**		**25**		**26**	
Chloride	**3.7**		**4.1**		**5**		**3.6**		**3.6**		**3.5**		**3.5**		**5**		**3.5**		**3.6**		**3.5**		**5.3**	
Sulfate	**5.1**		**5.1**		**4.9**		**5.1**		**5**		**5**		**5**		**4.9**		**5**		**5.1**		**5**		**5**	
Total suspended solids	**6**		5	U	**6**		**6**		5	U	**8**		**8**		**5**		**8**		5	U	**6**		5	U
Metals (ug/L)																								
Calcium	**6240**		**6620**		**7020**		**6930**		**6160**		**7060**		**6160**		**6790**		**6640**		**6270**		**6310**		**6710**	
Iron	**263**		**289**		**346**		**280**		**248**		**320**		**298**		**269**		**311**		**264**		**279**		**228**	
Magnesium	**2490**		**2570**		**2670**		**2510**		**2510**		**2580**		**2500**		**2580**		**2430**		**2510**		**2520**		**2560**	
Manganese	**19.5**		**20.9**		**22.7**		**21.1**		**19.1**		**22.3**		**20.8**		**19.7**		**22.4**		**19.9**		**19.7**		**18.4**	
Potassium	**1330**	**J**	**1540**	**J**	2000	U	**973**	**J**	**1310**	**J**	**1220**	**J**	**1280**	**J**	2000	U	2000	U	**1310**	**J**	**1300**	**J**	**932**	**J**
Sodium	**7370**		**7770**		**7760**		**7110**		**7300**		**7240**		**7260**		**7570**		**6840**		**7360**		**7400**		**7610**	

Notes:

Bold detected results

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U The analyte was analyzed for, but not detected above the sample reporting limit.

mg/L milligrams per liter

µg/L mircograms per liter

Table 2.6
Tidal Influence Study Quality Control/Quality Assurance Analytical Results

Sample Station	QAQC		QAQC		QAQC		QAQC		QAQC		QAQC	
Sample ID	GS-FB-071012		GS-PWRB-071012		GS-SCRB-071012		GS-TB-071004		GS-TB-071005		GS-TB-071012	
Sample Date	10/12/07		10/12/07		10/12/07		10/4/07		10/5/07		10/12/07	
Sample Type	Field Blank		Porewater Rinsate Blank		Sediment Core Rinsate Blank		Trip Blank		Trip Blank		Trip Blank	
Conventionals												
Amenable Cyanide (mg/L)	0.01	U	0.01	U	--		--		--		--	
Cyanide, Total (mg/L)	0.01	U	0.01	U	0.01	U	--		--		--	
Free Cyanide (ug/L)	10	U	10	U	--		--		--		--	
Metals (ug/L)												
Calcium	--		--		--		--		--		--	
Iron	20	U	**81**		**4.3**	**J**	--		--		--	
Magnesium	--		--		--		--		--		--	
Manganese	--		--		--		--		--		--	
Potassium	--		--		--		--		--		--	
Sodium	--		--		--		--		--		--	
PAHs (ug/L)												
2-Methylnaphthalene	**0.006**	**J**	**0.0084**	**J**	**0.0077**	**J**	--		--		--	
Acenaphthene	0.019	U	**0.01**	**J**	0.019	U	--		--		--	
Acenaphthylene	0.019	U	0.019	U	0.019	U	--		--		--	
Anthracene	0.019	U	0.019	U	0.019	U	--		--		--	
Chrysene	0.019	U	**0.0088**	**J**	**0.0057**	**J**	--		--		--	
Dibenzo(a,h)anthracene	0.019	U	0.019	U	0.019	U	--		--		--	
Dibenzofuran	--		--		--		--		--		--	
Fluoranthene	0.019	U	**0.029**		**0.015**	**J**	--		--		--	
Fluorene	0.019	U	**0.0069**	**J**	0.019	U	--		--		--	
Indeno(1,2,3-cd)pyrene	0.019	U	**0.0059**	**J**	**0.0046**	**J**	--		--		--	
Naphthalene	0.032		0.038		0.037		--		--		--	
Phenanthrene	0.019	U	**0.028**		**0.016**	**J**	--		--		--	
Pyrene	0.019	U	**0.028**		**0.014**	**J**	--		--		--	
VOC (ug/L)												
1,1,1,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 2.6
Tidal Influence Study Quality Control/Quality Assurance Analytical Results

Sample Station	QAQC		QAQC		QAQC		QAQC		QAQC		QAQC	
Sample ID	GS-FB-071012		GS-PWRB-071012		GS-SCRB-071012		GS-TB-071004		GS-TB-071005		GS-TB-071012	
Sample Date	10/12/07		10/12/07		10/12/07		10/4/07		10/5/07		10/12/07	
Sample Type	Field Blank		Porewater Rinsate Blank		Sediment Core Rinsate Blank		Trip Blank		Trip Blank		Trip Blank	
1,2,4-Trichlorobenzene	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dibromoethane	2	U	2	U	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
1,4-Dichlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
2-Chloroethylvinylether	5	U	5	U	5	U	5	U	5	U	5	U
2-Hexanone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	**4.6**	**J**	**4.5**	**J**	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Benzo(a)anthracene	0.019	U	**0.0068**	**J**	**0.005**	**J**	--		--		--	
Benzo(a)pyrene	0.019	U	0.019	U	0.019	U	--		--		--	
Benzo(b)fluoranthene	0.019	U	**0.0087**	**J**	**0.0049**	**J**	--		--		--	
Benzo(g,h,i)perylene	0.019	U	**0.007**	**J**	**0.0051**	**J**	--		--		--	
Benzo(k)fluoranthene	0.019	U	**0.0036**	**J**	0.019	U	--		--		--	
Bromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ
Carbon disulfide	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	**0.15**	**J**	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
cis-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Table 2.6
Tidal Influence Study Quality Control/Quality Assurance Analytical Results

Sample Station	QAQC		QAQC		QAQC		QAQC		QAQC		QAQC	
Sample ID	GS-FB-071012		GS-PWRB-071012		GS-SCRB-071012		GS-TB-071004		GS-TB-071005		GS-TB-071012	
Sample Date	10/12/07		10/12/07		10/12/07		10/4/07		10/5/07		10/12/07	
Sample Type	Field Blank		Porewater Rinsate Blank		Sediment Core Rinsate Blank		Trip Blank		Trip Blank		Trip Blank	
Ethylbenzene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Hexachlorobutadiene	2	U	2	U	2	U	2	U	2	U	2	U
Iodomethane	5	U	5	U	5	U	5	U	5	U	5	U
Isopropylbenzene	2	U	2	U	2	U	2	U	2	U	2	U
m,p-Xylene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Methylene chloride	**0.26**	**J**	**0.21**	**J**	**0.21**	**J**	2	U	2	U	2	U
Methyltert-butylether	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	3	U	3	U	3	U	3	U	3	U	3	U
o-Xylene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Styrene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	**0.45**	**J**	**0.37**	**J**	**0.3**	**J**	0.5	U	0.5	U	0.5	U
trans-1,2-Dichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	10	U	10	U	10	U	10	U	10	U	10	U
Trichloroethene	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Vinyl acetate	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U

Notes:

Bold detected results

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U The analyte was analyzed for, but not detected above the sample reporting limit.

UJ The analyte was not detected above the sample reporting limit. However, the sample reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

mg/L milligrams per liter

µg/L mircograms per liter

Table 2.7
Comparison of TZW Concentrations Observed During Tidal Study and Phase 2 Offshore Investigation

Investigation	Phase 2 Offshore		TZW Tidal Study										Phase 2 Offshore	
Sample Station	GS-B7		GS-B7		GS-B7		GS-B7		GS-B7		GS-B7		GS-C7	
Sample ID	GS-B7-A		GS-B7PWE-071004		GS-B7PWE-071005		GS-B7PWSH-071005		GS-B7PWSL-071005		GS-B7PWSL-071006		GS-C7-A	
Sample Date	7/5/2007		10/4/07		10/5/07		10/5/07		10/5/07		10/6/07		7/11/2007	
Tide Condition	NA		Ebb		Ebb		Slack High		Slack Low		Slack Low		1 to 2	
Screened Interval (ft)	1 to 2		0.8 to 1.3		0.8 to 1.3		0.8 to 1.3		0.8 to 1.3		0.8 to 1.3		1 to 2	
Conventionals (mg/L)														
Alkalinity, Total (mg/L)	--		--		--		--		--		--		--	
Amenable Cyanide (mg/L)	0.01	U	--		--		--		--		--		0.01	U
Chloride (mg/L)	--		--		--		--		--		--		--	
Cyanide, Total (mg/L)	**2.74**		--		--		--		--		--		**0.1**	
Dissolved organic carbon (mg/L)	--		--		--		--		--		--		--	
Free Cyanide (ug/L)	**0.023**		--		--		--		--		--		0.01	U
Sulfate (mg/L)	--		--		--		--		--		--		--	
Sulfide (mg/L)	--		--		--		--		--		--		--	
Total organic carbon (mg/L)	--		--		--		--		--		--		--	
Metals (ug/L)														
Calcium	**139,000**		**59100**		**55600**		**54600**		**52100**		**57400**		**81,200**	
Iron	**289,000**		**47300**		**48600**		**42300**		**39100**		**43300**		**32,200**	
Magnesium	**69,500**		**19500**		**18900**		**18700**		**17500**		**18700**		**25,600**	
Manganese	**9,420**		**5370**		**5210**		**5210**		**4870**		**5280**		**2,310**	
Potassium	**9,490**		**2990**		**3860**		**3860**		**3640**		**3770**		**5,820**	
Sodium	**23,500**		**12900**		**13300**		**13200**		**12800**		**12300**		**26,100**	
PAHs (ug/L)														
2-Methylnaphthalene	**140**		--		--		--		--		--		**13**	
Acenaphthene	**190**		--		--		--		--		--		**31**	
Acenaphthylene	**4.5**		--		--		--		--		--		**0.67**	
Anthracene	**110**		--		--		--		--		--		**4.1**	
Benzo(a)anthracene	**60**		--		--		--		--		--		**2.7**	
Benzo(a)pyrene	**50**		--		--		--		--		--		**2.8**	
Benzo(b)fluoranthene	**45**		--		--		--		--		--		**2.3**	
Benzo(g,h,i)perylene	**39**		--		--		--		--		--		**2.5**	
Benzo(k)fluoranthene	**15**		--		--		--		--		--		**0.84**	
Chrysene	**79**		--		--		--		--		--		**5.1**	
Dibenzo(a,h)anthracene	**5**		--		--		--		--		--		**0.27**	
Dibenzofuran	**17**		--		--		--		--		--		**0.51**	
Fluoranthene	**270**		--		--		--		--		--		**9**	
Fluorene	**110**		--		--		--		--		--		**9.7**	
Indeno(1,2,3-cd)pyrene	**46**		--		--		--		--		--		**2.4**	
Naphthalene	**120**		--				--		--		--		**65**	
Phenanthrene	**520**		--		--		--		--		--		**16**	
Pyrene	**270**		--		--		--		--		--		**11**	
VOC (ug/L)														
1,1,1,2-Tetrachloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,1,1-Trichloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,1,2-Trichloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,1-Dichloroethene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,2,3-Trichloropropane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,2,4-Trichlorobenzene	2	U	2	U	2	UJ	2	U	2	U	2	U	2	U
1,2-Dibromoethane	2	U	2	U	2	UJ	2	U	2	U	2	U	2	U
1,2-Dichlorobenzene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,2-Dichloropropane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
1,3-Dichlorobenzene	0.5	U	**2.6**		**1.1**	**J**	**0.77**		**2.5**		**0.76**		0.5	U
1,4-Dichlorobenzene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
2-Butanone (MEK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ

Table 2.7
Comparison of TZW Concentrations Observed During Tidal Study and Phase 2 Offshore Investigation

Investigation	Phase 2 Offshore		TZW Tidal Study										Phase 2 Offshore	
Sample Station	GS-B7		GS-B7		GS-B7		GS-B7		GS-B7		GS-B7		GS-C7	
Sample ID	GS-B7-A		GS-B7PWE-071004		GS-B7PWE-071005		GS-B7PWSH-071005		GS-B7PWSL-071005		GS-B7PWSL-071006		GS-C7-A	
Sample Date	7/5/2007		10/4/07		10/5/07		10/5/07		10/5/07		10/6/07		7/11/2007	
Tide Condition	NA		Ebb		Ebb		Slack High		Slack Low		Slack Low		1 to 2	
Screened Interval (ft)	1 to 2		0.8 to 1.3		0.8 to 1.3		0.8 to 1.3		0.8 to 1.3		0.8 to 1.3		1 to 2	
2-Chloroethylvinylether	5	U	5	U	5	UJ	5	U	5	U	5	UJ	5	UJ
2-Hexanone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	**8.8**		**0.19**	**J**	**0.24**	**J**	**0.24**	**J**	**0.19**	**J**	**0.36**	**J**	**0.34**	**J**
Bromochloromethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Bromodichloromethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Bromoform	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Bromomethane	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U	0.5	U
Carbon disulfide	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Carbon tetrachloride	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Chlorobenzene	0.5	U	0.5	U	**0.2**	**J**	**0.2**	**J**	0.5	U	**0.15**	**J**	0.5	U
Chloroethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Chloroform	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Chloromethane	0.81	U	0.5	U	**0.21**	**J**	0.5	U	**0.15**	**J**	**0.22**	**J**	0.5	U
cis-1,3-Dichloropropene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Dibromochloromethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Dibromomethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Dichlorodifluoromethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Ethylbenzene	**33**		**0.43**	**J**	**0.55**	**J**	**0.6**		**0.36**	**J**	**0.48**	**J**	**0.52**	
Hexachlorobutadiene	2	U	2	U	2	UJ	2	U	2	U	2	U	2	U
Iodomethane	**4.8**	**J**	5	U	5	UJ	5	U	5	U	5	U	5	U
Isopropylbenzene	**2.9**		**2**		**3.9**	**J**	**3.6**		**1.5**	**J**	**2.4**		**1.8**	**J**
m,p-Xylene	**1.2**		**0.69**		**0.65**	**J**	**0.64**		**0.53**		**0.71**		**0.32**	**J**
Methylene chloride			2	U	2	UJ	2	U	2	U	2	U		
Methyltert-butylether	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Naphthalene	**100**		**7.2**		**15**	**J**	**19**		**10**		**17**		**85**	
o-Xylene	**2.9**		**0.56**		**0.75**	**J**	**0.78**		**0.46**	**J**	**0.66**		**0.42**	**J**
Styrene	**0.18**	**J**	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Tetrachloroethene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Toluene	**14**		**2.6**		**1.1**	**J**	**0.82**		**1.2**		**1.2**		**0.22**	**J**
trans-1,2-Dichloroethene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,3-Dichloropropene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
trans-1,4-Dichloro-2-butene	10	U	10	U	10	UJ	10	U	10	U	10	UJ	10	UJ
Trichloroethene	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	0.5	U
Trichlorofluoromethane	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	UJ	0.5	U
Vinyl acetate	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.5	U	0.5	U	0.5	UJ	0.5	U	0.5	U	0.5	U	**0.12**	**J**

Table 2.7
Comparison of TZW Concentrations Observed During Tidal Study and Phase 2 Offshore Investigation

Investigation	TZW Tidal Study														Phase 2 Offshore	
Sample Station	GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-D5	
Sample ID	GS-C7PWE-071004		GS-C7PWE-071005		GS-C7PWSH-071004		GS-C7PWSH-071005		GS-C7PWSL-071004		GS-C7PWSL-071005		GS-C7PWSL-071006		GS-D5-A	
Sample Date	10/4/07		10/5/07		10/4/07		10/5/07		10/4/07		10/5/07		10/6/07		7/24/2007	
Tide Condition	Ebb		Ebb		Slack High		Slack High		Slack Low		Slack Low		Slack Low		NA	
Screened Interval (ft)	1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1 to 2	
Conventionals (mg/L)																
Alkalinity, Total (mg/L)	**324**		**322**		**156**		**270**		**225**		**354**		**354**		--	
Amenable Cyanide (mg/L)	**0.01**	**R**	0.01	U	**0.01**	**R**	0.01	U	**0.01**	**R**	**0.07**		0.01	UJ	0.01	U
Chloride (mg/L)	**5.8**		**6.9**		**4.8**		**6.1**		**5.4**		**6.9**		**6.9**		--	
Cyanide, Total (mg/L)	**0.31**		**0.42**		**0.24**		**0.32**		**0.26**		**0.42**		**0.47**		0.01	U
Dissolved organic carbon (mg/L)	**12.9**		**15**		**5.8**		**14**		**9.8**		**16.4**		**16**		--	
Free Cyanide (ug/L)	10	U	10	U	10	U	10	U	10	U	10	U	10	U	0.01	UJ
Sulfate (mg/L)	**1.8**		**0.4**		**3.2**		**1.7**		**2.4**		**0.5**		**0.8**		--	
Sulfide (mg/L)	0.05	UJ	**0.014**	**J**	0.05	UJ	**0.027**	**J**	**0.12**	**J**	**0.027**	**J**	**0.07**		--	
Total organic carbon (mg/L)	**19.6**		**19.5**		**11.4**		**18**		**21.1**		**19.5**		**18**		--	
Metals (ug/L)																
Calcium	**54000**		**54700**		**49900**		**60900**		**47400**		**58700**		**50900**		**49,700**	
Iron	**39500**		**40100**		**35900**		**48000**		**37200**		**43200**		**37200**		**20,100**	
Magnesium	**18900**		**19800**		**17500**		**22500**		**17000**		**21200**		**17900**		**19,200**	
Manganese	**2420**		**2600**		**2210**		**2910**		**2130**		**2790**		**2290**		**1,920**	
Potassium	**3230**		**3760**		**3650**		**4180**		**2900**		**3950**		**2790**		**4,510**	
Sodium	**12200**		**13300**		**11900**		**14300**		**11300**		**13900**		**12000**		**61,000**	
PAHs (ug/L)																
2-Methylnaphthalene	**570**		**660**		**520**		**770**		**1000**		**670**		**510**		**0.06**	
Acenaphthene	**340**		**370**		**320**		**510**		**680**		**360**		**290**		**38**	
Acenaphthylene	**4.5**		**3.6**		**3.5**		**12**		**12**		**4.9**		**2.4**		**0.23**	
Anthracene	**36**		**31**		**30**		**91**		**97**		**40**		**21**		**0.4**	**J**
Benzo(a)anthracene	**15**		**11**		**12**		**52**		**59**		**16**		**5.4**		**0.021**	
Benzo(a)pyrene	**18**		**13**		**14**		**66**		**75**		**20**		**6.1**		**0.013**	**J**
Benzo(b)fluoranthene	**16**		**11**		**12**		**57**		**65**		**18**		**5.3**		**0.014**	**J**
Benzo(g,h,i)perylene	**14**		**9.5**		**11**		**49**		**54**		**15**		**4.6**		**0.0082**	**J**
Benzo(k)fluoranthene	**5.4**		**3.5**		**3.7**		**18**		**20**		**5.5**		**1.6**		**0.0056**	**J**
Chrysene	**18**		**13**		**15**		**64**		**70**		**20**		**7.3**		**0.019**	**J**
Dibenzo(a,h)anthracene	**1.9**		**1.3**		**1.5**		**5.6**		**6.7**		**2.1**		**0.59**		0.02	U
Dibenzofuran	**17**		**18**		**15**		**28**		**33**		**19**		**16**		**0.039**	
Fluoranthene	**75**		**55**		**61**		**250**		**310**		**82**		**33**		**0.076**	
Fluorene	**82**		**79**		**71**		**150**		**170**		**89**		**70**		**8.5**	
Indeno(1,2,3-cd)pyrene	**13**		**8.9**		**10**		**47**		**53**		**15**		**4.3**		**0.008**	**J**
Naphthalene	**11000**		**14000**		**9500**		**12000**		**15000**		**12000**		**12000**		**0.13**	
Phenanthrene	**280**		**240**		**270**		**570**		**790**		**270**		**160**		**5.4**	
Pyrene	**77**		**58**		**64**		**250**		**310**		**84**		**34**		**0.07**	
VOC (ug/L)																
1,1,1,2-Tetrachloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,1,1-Trichloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,1,2,2-Tetrachloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,1,2-Trichloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,1-Dichloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,1-Dichloroethene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,2,3-Trichloropropane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,2,4-Trichlorobenzene	200	U	400	U	200	U	200	UJ	200	U	400	U	100	U	2	U
1,2-Dibromoethane	200	U	400	U	200	U	200	UJ	200	U	400	U	100	U	2	U
1,2-Dichlorobenzene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,2-Dichloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,2-Dichloropropane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,3-Dichlorobenzene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
1,4-Dichlorobenzene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
2-Butanone (MEK)	2000	UJ	4000	UJ	2000	UJ	2000	UJ	2000	UJ	4000	UJ	1000	UJ	20	UJ

Table 2.7
Comparison of TZW Concentrations Observed During Tidal Study and Phase 2 Offshore Investigation

Investigation	TZW Tidal Study														Phase 2 Offshore	
Sample Station	GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-C7		GS-D5	
Sample ID	GS-C7PWE-071004		GS-C7PWE-071005		GS-C7PWSH-071004		GS-C7PWSH-071005		GS-C7PWSL-071004		GS-C7PWSL-071005		GS-C7PWSL-071006		GS-D5-A	
Sample Date	10/4/07		10/5/07		10/4/07		10/5/07		10/4/07		10/5/07		10/6/07		7/24/2007	
Tide Condition	Ebb		Ebb		Slack High		Slack High		Slack Low		Slack Low		Slack Low		NA	
Screened Interval (ft)	1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1.4 to 1.9		1 to 2	
2-Chloroethylvinylether	500	U	1000	U	500	U	500	UJ	500	U	1000	U	250	UJ	5	UJ
2-Hexanone	2000	UJ	4000	UJ	2000	UJ	2000	UJ	2000	UJ	4000	UJ	1000	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	2000	UJ	4000	UJ	2000	UJ	2000	UJ	2000	UJ	4000	UJ	1000	UJ	20	UJ
Acetone	2000	UJ	4000	UJ	2000	UJ	2000	UJ	2000	UJ	4000	UJ	1000	UJ	20	UJ
Acrolein	2000	UJ	4000	UJ	2000	UJ	2000	UJ	2000	UJ	4000	UJ	1000	UJ	20	UJ
Acrylonitrile	500	UJ	1000	UJ	500	UJ	500	UJ	500	UJ	1000	UJ	250	UJ	5	UJ
Benzene	**3000**		**4800**		**2300**		**3100**	**J**	**2700**		**4400**		**4500**		0.5	U
Bromochloromethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Bromodichloromethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Bromoform	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	UJ
Bromomethane	50	UJ	100	UJ	50	UJ	50	UJ	50	UJ	100	UJ	25	U	0.5	U
Carbon disulfide	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Carbon tetrachloride	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Chlorobenzene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Chloroethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Chloroform	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Chloromethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
cis-1,3-Dichloropropene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Dibromochloromethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Dibromomethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Dichlorodifluoromethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Ethylbenzene	**460**		**690**		**360**		**470**	**J**	**420**		**630**		**660**		0.5	U
Hexachlorobutadiene	200	U	400	U	200	U	200	UJ	200	U	400	U	100	U	2	U
Iodomethane	500	U	1000	U	500	U	500	UJ	500	U	1000	U	250	U	5	U
Isopropylbenzene	**15**	**J**	**22**	**J**	**13**	**J**	**14**	**J**	**14**	**J**	400	U	**18**	**J**	**0.93**	**J**
m,p-Xylene	**250**		**380**		**210**		**260**	**J**	**240**		**350**		**350**		**0.23**	**J**
Methylene chloride	**66**	**J**	**52**	**J**	**49**	**J**	**64**	**J**	**41**	**J**	**50**	**J**	**15**	**J**		
Methyltert-butylether	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	UJ
Naphthalene	**19000**		**17000**		**15000**		**17000**	**J**	**13000**		**19000**		**17000**		2	U
o-Xylene	**140**		**210**		**110**		**140**	**J**	**130**		**190**		**210**		**0.31**	**J**
Styrene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Tetrachloroethene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Toluene	**28**	**J**	**38**	**J**	**21**	**J**	**94**	**J**	**26**	**J**	**42**	**J**	**40**		**0.72**	
trans-1,2-Dichloroethene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
trans-1,3-Dichloropropene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	UJ
trans-1,4-Dichloro-2-butene	1000	U	2000	U	1000	U	1000	UJ	1000	U	2000	U	500	UJ	10	UJ
Trichloroethene	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U
Trichlorofluoromethane	50	U	100	U	50	U	50	UJ	50	U	100	U	25	UJ	0.5	U
Vinyl acetate	500	UJ	1000	UJ	500	UJ	500	UJ	500	UJ	1000	UJ	250	UJ	5	UJ
Vinyl chloride	50	U	100	U	50	U	50	UJ	50	U	100	U	25	U	0.5	U

Table 2.7
Comparison of TZW Concentrations Observed During Tidal Study and Phase 2 Offshore Investigation

Investigation	TZW Tidal Study											
Sample Station	GS-D5		GS-D5		GS-D5		GS-D5		GS-D5		GS-D5	
Sample ID	GS-D5PWE-071004		GS-D5PWE-071005		GS-D5PWSH-071004		GS-D5PWSH-071005		GS-D5PWSL-071005		GS-D5PWSL-071006	
Sample Date	10/4/07		10/5/07		10/4/07		10/5/07		10/5/07		10/6/07	
Tide Condition	Ebb		Ebb		Slack High		Slack High		Slack Low		Slack Low	
Screened Interval (ft)	1.5 to 2.0		1.5 to 2.0		1.5 to 2.0		1.5 to 2.0		1.5 to 2.0		1.5 to 2.0	
Conventionals (mg/L)												
Alkalinity, Total (mg/L)	**400**		**383**		**502**		**374**		**382**		**372**	
Amenable Cyanide (mg/L)	**0.01**	**R**	0.01	U	**0.01**	**R**	0.01	U	0.01	U	**0.004**	**J**
Chloride (mg/L)	**25.9**		**24**		**30.1**		**21.2**		**22.6**		**20.7**	
Cyanide, Total (mg/L)	**0.009**	**J**	0.01	U	**0.06**		0.01	U	0.01	U	**0.004**	**J**
Dissolved organic carbon (mg/L)	**7.1**		**7.4**		**7**		**6.7**		**6.9**		**6.6**	
Free Cyanide (ug/L)	10	U	10	U	10	U	10	U	10	U	10	U
Sulfate (mg/L)	**0.3**		**0.4**		**0.12**	**J**	**0.7**		**0.6**		**0.9**	
Sulfide (mg/L)	0.05	UJ	0.05	U	0.05	UJ	0.05	U	0.05	U	0.05	U
Total organic carbon (mg/L)	**15.3**		**14.5**		**13.9**		**13.9**		**14.7**		**13.1**	
Metals (ug/L)												
Calcium	**97600**		**95100**		**107000**		**90600**		**93300**		**92700**	
Iron	**63400**		**59300**		**72000**		**55800**		**57700**		**55500**	
Magnesium	**31000**		**29900**		**33800**		**28800**		**29900**		**30200**	
Manganese	**10100**		**9570**		**10200**		**9160**		**9340**		**9930**	
Potassium	**5070**		**5260**		**5550**		**5030**		**5220**		**4810**	
Sodium	**17400**		**18400**		**18800**		**17600**		**18200**		**16700**	
PAHs (ug/L)												
2-Methylnaphthalene	**0.0078**	**J**	**0.0091**	**J**	**0.014**	**J**	**0.0097**	**J**	**0.0078**	**J**	**0.021**	
Acenaphthene	**9.5**		**11**		**9.2**		**9.2**		**9.6**		**11**	
Acenaphthylene	**0.026**		**0.029**		**0.023**		**0.027**		**0.029**		**0.036**	
Anthracene	**0.051**		**0.06**		**0.044**		**0.06**		**0.061**		**0.099**	
Benzo(a)anthracene	0.02	U	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
Benzo(a)pyrene	**0.0087**	**J**	0.019	U	0.02	U	0.019	U	0.019	U	**0.0064**	**J**
Benzo(b)fluoranthene	**0.014**	**J**	0.019	U	0.02	U	0.019	U	0.019	U	**0.0081**	**J**
Benzo(g,h,i)perylene	**0.014**	**J**	0.019	U	0.02	U	0.019	U	0.019	U	**0.0041**	**J**
Benzo(k)fluoranthene	**0.0065**	**J**	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
Chrysene	**0.0064**	**J**	**0.0047**	**J**	**0.004**	**J**	**0.0036**	**J**	**0.0044**	**J**	**0.017**	**J**
Dibenzo(a,h)anthracene	**0.0065**	**J**	0.019	U	0.02	U	0.019	U	0.019	U	0.019	U
Dibenzofuran	**0.013**	**J**	**0.016**	**J**	**0.012**	**J**	**0.018**	**J**	**0.018**	**J**	**0.025**	
Fluoranthene	**0.11**		**0.13**		**0.1**		**0.12**		**0.13**		**0.16**	
Fluorene	**1.8**		**2**		**1.6**		**1.9**		**1.9**		**2.4**	
Indeno(1,2,3-cd)pyrene	**0.018**	**J**	0.019	U	0.02	U	0.019	U	0.019	U	**0.0037**	**J**
Naphthalene	0.036	U	0.045	U	**0.11**		0.042	U	0.037	U	**0.068**	
Phenanthrene	**1.1**		**1.2**		**0.99**		**1.1**		**1.2**		**1.6**	
Pyrene	**0.078**		**0.085**		**0.071**		**0.084**		**0.086**		**0.15**	
VOC (ug/L)												
1,1,1,2-Tetrachloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1,1-Trichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1,2,2-Tetrachloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1,2-Trichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1-Dichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,1-Dichloroethene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2,3-Trichloropropane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2,4-Trichlorobenzene	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
1,2-Dibromoethane	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
1,2-Dichlorobenzene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2-Dichloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,2-Dichloropropane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
1,3-Dichlorobenzene	**0.32**	**J**	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	**0.14**	**J**
1,4-Dichlorobenzene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
2-Butanone (MEK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ

Table 2.7
Comparison of TZW Concentrations Observed During Tidal Study and Phase 2 Offshore Investigation

Investigation	TZW Tidal Study											
Sample Station	GS-D5		GS-D5		GS-D5		GS-D5		GS-D5		GS-D5	
Sample ID	GS-D5PWE-071004		GS-D5PWE-071005		GS-D5PWSH-071004		GS-D5PWSH-071005		GS-D5PWSL-071005		GS-D5PWSL-071006	
Sample Date	10/4/07		10/5/07		10/4/07		10/5/07		10/5/07		10/6/07	
Tide Condition	Ebb		Ebb		Slack High		Slack High		Slack Low		Slack Low	
Screened Interval (ft)	1.5 to 2.0		1.5 to 2.0		1.5 to 2.0		1.5 to 2.0		1.5 to 2.0		1.5 to 2.0	
2-Chloroethylvinylether	5	U	5	UJ	5	U	5	UJ	5	UJ	5	UJ
2-Hexanone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
4-Methyl-2-pentanone (MIBK)	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acetone	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrolein	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ	20	UJ
Acrylonitrile	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Benzene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromochloromethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromodichloromethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromoform	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Bromomethane	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	UJ	0.5	U
Carbon disulfide	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Carbon tetrachloride	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chlorobenzene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chloroethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chloroform	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Chloromethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
cis-1,3-Dichloropropene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Dibromochloromethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Dibromomethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Dichlorodifluoromethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Ethylbenzene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Hexachlorobutadiene	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
Iodomethane	5	U	5	UJ	5	U	5	UJ	5	UJ	5	U
Isopropylbenzene	2	U	2	UJ	2	U	2	UJ	2	UJ	**0.11**	**J**
m,p-Xylene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Methylene chloride	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
Methyltert-butylether	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Naphthalene	2	U	2	UJ	2	U	2	UJ	2	UJ	2	U
o-Xylene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Styrene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Tetrachloroethene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Toluene	**0.75**		**0.78**	**J**	0.5	U	0.5	UJ	**1.1**	**J**	**0.2**	**J**
trans-1,2-Dichloroethene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
trans-1,3-Dichloropropene	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
trans-1,4-Dichloro-2-butene	10	U	10	UJ	10	U	10	UJ	10	UJ	10	UJ
Trichloroethene	**0.16**	**J**	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U
Trichlorofluoromethane	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	UJ
Vinyl acetate	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ	5	UJ
Vinyl chloride	0.5	U	0.5	UJ	0.5	U	0.5	UJ	0.5	UJ	0.5	U

Notes:

detected results

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample

U The analyte was analyzed for, but not detected above the sample reporting limit.

UJ The analyte was not detected above the sample reporting limit. However, the sample reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The result was rejected due to analysis of the sample beyond two times the holding time (14 days)

mg/L milligrams per liter

µg/L micrograms per liter

Table 3.1
Coordinates of Cyanide Investigation Sampling Locations

Station ID	Station Coordinates (Oregon SP NAD 83 North Zone)	
	Northing (ft)	Easting (ft)
GSW-01	706710	7622716
GSW-02	706572	7622885
GSW-03	706188	7623201
GSW-04	706262	7623259
GSW-05	706312	7623341
GSW-06	706044	7623412
GSW-07	706096	7623486
GSW-08	706197	7623537
GSW-09	705906	7623644
GSW-10	706041	7623696
GSW-11	705760	7623909
GSW-12	705950	7624030
GSW-13	705614	7624164
GSW-14	705656	7624490
GSW-15	705407	7624534
GSW-16	705419	7624870
GSW-17	705242	7624801
GSW-18	705299	7625123
GSW-19	704732	7625987
GSW-20	704653	7626127

Notes:

GSW Gasco Surface Water

Table 3.2
Cyanide Investigation Field Parameters

Station ID	Tide Cycle ID	Depth ID	Sampling Date	Field Parameter Sampling Time	Sample Depth (ft)	pH ()	Conductivity (µS/cm)	Temperature (C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
GSW-01	Slack High	Shallow	10/01/07	9:56	2	6.83	91.2	15.96	9.11	449	1.5
GSW-01	Slack High	Mid	10/01/07	10:00	25	6.8	91.5	15.93	9	449	2.9
GSW-01	Slack High	Bottom	10/01/07	10:05	49	6.81	91.8	15.9	8.9	450	4.5
GSW-03	Slack High	Shallow	10/01/07	10:58	2	6.83	90.9	15.47	9.24	451	0.5
GSW-03	Slack High	Mid	10/01/07	10:59	16	6.83	90	15.91	9.07	452	0
GSW-03	Slack High	Bottom	10/01/07	11:00	31	6.81	90	15.91	9	452	0.7
GSW-07	Slack High	Shallow	10/01/07	11:41	2	6.85	89.6	15.88	9.14	451	1.8
GSW-07	Slack High	Mid	10/01/07	11:43	23	6.82	88.6	15.86	9	452	2.4
GSW-07	Slack High	Bottom	10/01/07	11:45	46	6.81	88.7	15.86	8.91	453	3.9
GSW-09	Ebb	Shallow	10/01/07	12:41	2	6.84	90.3	15.94	9.11	452	1.3
GSW-09	Ebb	Mid	10/01/07	12:42	15	6.83	90.1	15.87	9.08	452	1.6
GSW-09	Ebb	Bottom	10/01/07	12:43	31	6.83	89.8	15.86	9.02	452	4.6
GSW-12	Ebb	Shallow	10/01/07	13:31	2	6.86	87.6	16.04	9.17	450	0.4
GSW-12	Ebb	Mid	10/01/07	13:32	23	6.82	86.7	15.83	9.03	451	2.4
GSW-12	Ebb	Bottom	10/01/07	13:33	46	6.82	86.7	15.83	8.94	451	3.2
GSW-13	Ebb	Shallow	10/01/07	15:25	2	6.85	91.2	16.12	9.2	451	0.9
GSW-13	Ebb	Mid	10/01/07	15:26	17	6.83	90.1	15.94	9.08	451	2.2
GSW-13	Ebb	Bottom	10/01/07	15:27	33	6.82	88	15.85	8.98	452	2.7
GSW-18	Ebb	Shallow	10/01/07	16:09	2	6.88	87.1	15.95	9.26	447	1
GSW-18	Ebb	Mid	10/01/07	16:10	23	6.83	86.3	15.65	9.05	449	2.6
GSW-18	Ebb	Bottom	10/01/07	16:11	46	6.82	86.1	15.83	8.9	450	4.8
GSW-02	Slack Low	Shallow	10/02/07	7:34	2	6.8	85.1	15.63	9.04	448	1.8
GSW-02	Slack Low	Mid	10/02/07	7:35	24	6.79	85.7	15.65	8.94	447	2.1
GSW-02	Slack Low	Bottom	10/02/07	7:36	47	6.83	85.1	15.65	8.89	446	2.7
GSW-04	Slack Low	Shallow	10/02/07	8:19	2	6.81	86.2	15.66	8.97	448	1.8
GSW-04	Slack Low	Mid	10/02/07	8:20	25	6.8	85.4	15.64	8.93	449	1
GSW-04	Slack Low	Bottom	10/02/07	8:21	49	6.8	85.1	15.65	8.86	448	2
GSW-06	Slack High	Shallow	10/02/07	10:29	2	6.8	86.5	15.72	8.99	449	0.8
GSW-06	Slack High	Mid	10/02/07	10:30	13	6.8	86.1	15.74	8.95	449	1.3
GSW-06	Slack High	Bottom	10/02/07	10:31	25	6.8	86.1	15.71	8.87	449	2.3
GSW-08	Slack High	Shallow	10/02/07	11:13	2	6.9	86.1	15.75	9.1	442	1.1

Table 3.2
Cyanide Investigation Field Parameters

Station ID	Tide Cycle ID	Depth ID	Sampling Date	Field Parameter Sampling Time	Sample Depth (ft)	pH ()	Conductivity (µS/cm)	Temperature (C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
GSW-08	Slack High	Mid	10/02/07	11:14	24	6.86	85.7	15.71	8.93	446	1.7
GSW-08	Slack High	Bottom	10/02/07	11:15	47	6.84	85.8	15.72	8.84	446	2.8
GSW-10	Slack High	Shallow	10/02/07	12:10	2	6.82	86.1	15.7	9.08	446	1.1
GSW-10	Slack High	Mid	10/02/07	12:11	24	6.8	85.3	15.66	8.93	447	1.9
GSW-10	Slack High	Bottom	10/02/07	12:13	48	6.81	85.6	15.66	8.84	447	3.8
GSW-11	Ebb	Shallow	10/02/07	13:57	2	6.84	90.6	14.46	9.65	443	1.7
GSW-11	Ebb	Mid	10/02/07	13:58	18	6.81	87.3	15.68	9.02	445	3.1
GSW-11	Ebb	Bottom	10/02/07	13:59	33	6.82	86.1	15.65	8.94	445	3.5
GSW-13	Slack High	Shallow	10/02/07	13:10	2	6.95	92.1	14.26	10.01	436	2.2
GSW-13	Slack High	Mid	10/02/07	13:12	17	6.88	90.6	14.28	9.46	441	3.1
GSW-13	Slack High	Bottom	10/02/07	13:13	34	6.85	89.1	14.34	9.37	442	3.3
GSW-14	Slack Low	Shallow	10/02/07	9:02	2	6.8	84.1	15.61	9.07	449	0.7
GSW-14	Slack Low	Mid	10/02/07	9:08	24	6.81	85.1	15.6	9.02	448	2.7
GSW-14	Slack Low	Bottom	10/02/07	9:12	48	6.8	85.3	15.6	8.95	448	3.2
GSW-15	Ebb	Shallow	10/02/07	14:50	2	7.05	115.7	15.76	9.18	428	3.6
GSW-15	Ebb	Mid	10/02/07	14:51	18	7.01	86.3	15.57	9.08	431	4
GSW-15	Ebb	Bottom	10/02/07	14:52	36	6.92	85.1	15.55	9	435	5.9
GSW-20	Ebb	Shallow	10/02/07	15:40	2	6.85	85.6	15.56	9.23	441	0.7
GSW-20	Ebb	Mid	10/02/07	15:42	23	6.84	85.6	15.54	9.14	442	0.8
GSW-20	Ebb	Bottom	10/02/07	15:44	46	6.82	85.7	15.5	8.99	444	4.4
GSW-01	Slack Low	Shallow	10/03/07	7:30	2	7.11	86.3	15.24	9.27	427	1
GSW-01	Slack Low	Mid	10/03/07	7:35	24	6.99	86.1	15.26	9.15	431	2.9
GSW-01	Slack Low	Bottom	10/03/07	7:37	47	6.96	86.1	15.26	9.09	431	2.8
GSW-03	Slack Low	Shallow	10/03/07	8:15	2	7.03	86.3	15.19	9.27	430	1.7
GSW-03	Slack Low	Mid	10/03/07	8:16	16	7	86.6	15.21	9.22	430	0.7
GSW-03	Slack Low	Bottom	10/03/07	8:17	31	6.99	86.3	15.22	9.16	430	1.6
GSW-07	Slack Low	Shallow	10/03/07	9:03	2	7.01	86.4	15.16	9.26	431	0
GSW-07	Slack Low	Mid	10/03/07	9:04	27	6.96	86.7	15.21	9.17	433	1
GSW-07	Slack Low	Bottom	10/03/07	9:05	44	6.96	86.3	15.21	9.1	433	2.9
GSW-09	Slack High	Shallow	10/03/07	11:54	2	7.03	88.3	14.06	9.78	432	0.6
GSW-09	Slack High	Mid	10/03/07	11:55	17	7.01	88.1	14.34	9.4	433	0.9

Table 3.2
Cyanide Investigation Field Parameters

Station ID	Tide Cycle ID	Depth ID	Sampling Date	Field Parameter Sampling Time	Sample Depth (ft)	pH ()	Conductivity (µS/cm)	Temperature (C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
GSW-09	Slack High	Bottom	10/03/07	11:56	33	6.97	86.8	14.91	9.24	435	1.4
GSW-11	Slack High	Shallow	10/03/07	13:23	2	7.01	89.8	15.23	9.31	433	0.7
GSW-11	Slack High	Mid	10/03/07	13:24	17	6.97	86.7	15.25	9.21	434	1.6
GSW-11	Slack High	Bottom	10/03/07	13:25	33	6.95	87.3	15.25	9.13	436	2.5
GSW-12	Slack High	Shallow	10/03/07	12:30	2	7.07	86.1	15.46	9.37	429	0
GSW-12	Slack High	Mid	10/03/07	12:34	23	6.92	86.1	15.23	9.2	436	2.4
GSW-12	Slack High	Bottom	10/03/07	12:36	45	6.91	86.1	15.24	9.06	436	4.7
GSW-17	Slack Low	Shallow	10/03/07	9:59	2	6.98	86.7	15.2	9.25	433	0.7
GSW-17	Slack Low	Mid	10/03/07	10:00	17	6.93	87.6	15.2	9.18	434	1.7
GSW-17	Slack Low	Bottom	10/03/07	10:01	34	6.92	87.4	15.21	9.11	435	3.1
GSW-17	Ebb	Shallow	10/03/07	15:10	2	7.03	87.6	15.55	9.62	432	0.1
GSW-17	Ebb	Mid	10/03/07	15:11	18	7	86.2	15.22	9.3	434	1.1
GSW-17	Ebb	Bottom	10/03/07	15:12	35	6.97	86.7	15.22	9.22	435	1.8
GSW-20	Slack High	Shallow	10/03/07	14:16	2	6.96	86.1	15.27	9.51	431	0
GSW-20	Slack High	Mid	10/03/07	14:17	23	7	87.2	15.22	9.31	433	0
GSW-20	Slack High	Bottom	10/03/07	14:19	45	6.93	87.3	15.2	9.2	436	2.2
GSW-02	Ebb	Shallow	10/04/07	7:30	2	7.19	85.7	15.02	9.29	429	1.6
GSW-02	Ebb	Mid	10/04/07	7:31	23	7.06	86	15.07	9.19	432	1.9
GSW-02	Ebb	Bottom	10/04/07	7:32	45	7.01	86.2	15.08	9.09	433	3.8
GSW-04	Slack High	Shallow	10/04/07	14:21	2	7.09	85.6	15.24	9.5	424	2.1
GSW-04	Slack High	Mid	10/04/07	14:22	25	6.97	85.8	15.16	9.29	430	1.2
GSW-04	Slack High	Bottom	10/04/07	14:23	48	6.98	85.7	15.11	9.14	431	3.5
GSW-04	Ebb	Shallow	10/04/07	8:15	2	7.02	86	15.01	9.3	430	1.5
GSW-04	Ebb	Mid	10/04/07	8:16	23	6.99	86.3	15.04	9.19	433	2
GSW-04	Ebb	Bottom	10/04/07	8:17	44	6.96	86	15.04	9.11	435	2.2
GSW-05	Slack Low	Shallow	10/04/07	9:14	2	7.02	85.9	15.01	9.29	432	1.3
GSW-05	Slack Low	Mid	10/04/07	9:15	25	6.99	85.6	15.02	9.22	435	1.5
GSW-05	Slack Low	Bottom	10/04/07	9:16	50	6.97	84.7	15.01	9.19	435	2
GSW-06	Slack Low	Shallow	10/04/07	9:51	2	7.04	87	14.93	9.35	430	1.2
GSW-06	Slack Low	Mid	10/04/07	9:52	16	7.02	87.2	14.95	9.2	432	0.5
GSW-06	Slack Low	Bottom	10/04/07	9:53	32	6.99	86.9	15.02	9.17	434	2.2

Table 3.2
Cyanide Investigation Field Parameters

Station ID	Tide Cycle ID	Depth ID	Sampling Date	Field Parameter Sampling Time	Sample Depth (ft)	pH ()	Conductivity (µS/cm)	Temperature (C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
GSW-08	Slack Low	Shallow	10/04/07	10:26	2	7.02	86	14.96	9.35	431	1.6
GSW-08	Slack Low	Mid	10/04/07	10:27	23	7.01	85.5	15	9.24	433	1.6
GSW-08	Slack Low	Bottom	10/04/07	10:29	44	6.91	85	15.01	9.14	437	2.1
GSW-15	Slack High	Shallow	10/04/07	13:05	2	7.01	85.8	15.26	9.33	432	0.4
GSW-15	Slack High	Mid	10/04/07	13:06	17	6.97	86.1	15.1	9.26	434	1.4
GSW-15	Slack High	Bottom	10/04/07	13:07	35	6.94	85.9	15.12	9.18	434	2.1
GSW-16	Slack High	Shallow	10/04/07	13:40	2	7.07	85.2	15.32	9.46	427	0
GSW-16	Slack High	Mid	10/04/07	13:42	24	6.94	85.4	15.07	9.26	433	1.6
GSW-16	Slack High	Bottom	10/04/07	13:44	47	6.89	85.1	15.07	9.09	434	3.2
GSW-20	Slack Low	Shallow	10/04/07	11:09	2	6.95	85	15.02	9.38	433	0.4
GSW-20	Slack Low	Mid	10/04/07	11:10	23	6.98	85.7	15	9.27	434	0.7
GSW-20	Slack Low	Bottom	10/04/07	11:11	45	6.94	86.2	15	9.15	435	2.1
GSW-01	Ebb	Shallow	10/05/07	7:20	2	6.89	85.8	14.87	9.43	430	0.5
GSW-01	Ebb	Mid	10/05/07	7:21	23	6.8	86.3	14.92	9.3	433	1.2
GSW-01	Ebb	Bottom	10/05/07	7:22	46	6.81	86.4	14.91	9.19	433	2.8
GSW-03	Ebb	Shallow	10/05/07	8:00	2	6.93	86.4	14.78	9.42	425	0
GSW-03	Ebb	Mid	10/05/07	8:01	15	6.94	86.4	14.82	9.34	427	0
GSW-03	Ebb	Bottom	10/05/07	8:02	29	6.91	86.4	14.86	9.26	429	0
GSW-05	Slack High	Shallow	10/05/07	15:10	2	6.77	85.8	15.24	9.44	429	0.1
GSW-05	Slack High	Mid	10/05/07	15:11	27	6.8	86	14.97	9.35	430	0.6
GSW-05	Slack High	Bottom	10/05/07	15:12	54	6.76	86.3	14.9	9.15	431	2.1
GSW-07	Ebb	Shallow	10/05/07	8:43	2	6.74	86	14.89	9.34	434	0
GSW-07	Ebb	Mid	10/05/07	8:44	22	6.73	86	14.9	9.28	434	0.1
GSW-07	Ebb	Bottom	10/05/07	8:45	43	6.73	86.4	14.88	9.27	435	2.4
GSW-10	Slack Low	Shallow	10/05/07	12:15	2	6.77	86.4	14.88	9.37	432	0.2
GSW-10	Slack Low	Mid	10/05/07	12:16	23	6.77	85.8	14.86	9.28	432	1.2
GSW-10	Slack Low	Bottom	10/05/07	12:17	46	6.76	86.2	14.85	9.19	432	2.6
GSW-12	Slack Low	Shallow	10/05/07	10:52	2	6.76	85.7	14.85	9.39	433	0.5
GSW-12	Slack Low	Mid	10/05/07	10:53	22	6.76	85.8	14.86	9.31	434	0.4
GSW-12	Slack Low	Bottom	10/05/07	10:54	44	6.75	85.9	14.85	9.25	434	0.9
GSW-13	Slack Low	Shallow	10/05/07	10:30	2	6.72	88.3	14.86	9.46	434	1.1

Table 3.2
Cyanide Investigation Field Parameters

Station ID	Tide Cycle ID	Depth ID	Sampling Date	Field Parameter Sampling Time	Sample Depth (ft)	pH ()	Conductivity (µS/cm)	Temperature (C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
GSW-13	Slack Low	Mid	10/05/07	10:31	13	6.75	89.2	14.88	9.3	434	1.2
GSW-13	Slack Low	Bottom	10/05/07	10:32	26	6.75	90.6	14.88	9.26	434	1.3
GSW-14	Slack High	Shallow	10/05/07	14:10	2	6.79	85.7	15.02	9.44	429	0.7
GSW-14	Slack High	Mid	10/05/07	14:11	24	6.8	85.7	14.91	9.37	430	0.6
GSW-14	Slack High	Bottom	10/05/07	14:12	48	6.79	86.1	14.89	9.18	431	2.6
GSW-18	Slack High	Shallow	10/05/07	14:40	2	6.81	85.7	15	9.42	429	0
GSW-18	Slack High	Mid	10/05/07	14:41	24	6.79	86.2	14.93	9.35	431	0.4
GSW-18	Slack High	Bottom	10/05/07	14:42	47	6.76	86.3	14.88	9.22	431	2
GSW-19	Slack Low	Shallow	10/05/07	11:15	2	6.75	86.2	14.81	9.58	433	1.2
GSW-19	Slack Low	Mid	10/05/07	11:16	22	6.74	85.9	14.84	9.29	434	1.7
GSW-19	Slack Low	Bottom	10/05/07	11:17	44	6.75	86	14.84	9.23	432	2.3
GSW-19	Ebb	Shallow	10/05/07	9:12	2	6.73	85.9	14.85	9.35	434	1.1
GSW-19	Ebb	Mid	10/05/07	9:13	23	6.72	85.4	14.87	9.27	435	2.4
GSW-19	Ebb	Bottom	10/05/07	9:14	45	6.71	85.9	14.86	9.22	435	4.5
GSW-05	Ebb	Shallow	10/08/07	8:31	2	6.37	91.6	13.77	9.69	440	2.3
GSW-05	Ebb	Mid	10/08/07	8:32	26	6.47	91.9	13.75	9.67	434	3.5
GSW-05	Ebb	Bottom	10/08/07	8:33	52	6.6	92.5	13.76	9.48	427	3.3
GSW-06	Ebb	Shallow	10/08/07	8:56	2	6.83	92.5	13.49	9.91	417	0.4
GSW-06	Ebb	Mid	10/08/07	8:57	13	6.83	92	13.69	9.66	416	0.9
GSW-06	Ebb	Bottom	10/08/07	8:58	28	6.85	92	13.75	9.55	416	1
GSW-08	Ebb	Shallow	10/08/07	9:58	2	6.9	94	13.79	9.72	417	0
GSW-08	Ebb	Mid	10/08/07	9:59	22	6.89	94.1	13.78	9.67	418	0.1
GSW-08	Ebb	Bottom	10/08/07	10:00	44	6.89	92.5	13.77	9.54	418	0.9
GSW-09	Slack Low	Shallow	10/08/07	13:35	2	6.95	94.2	13.91	9.75	412	1.1
GSW-09	Slack Low	Mid	10/08/07	13:36	13	6.96	95.3	13.81	9.66	412	1.1
GSW-09	Slack Low	Bottom	10/08/07	13:37	25	6.95	95.3	13.81	9.58	413	2.3
GSW-10	Ebb	Shallow	10/08/07	10:45	2	7.06	96.8	13.82	9.76	405	0.8
GSW-10	Ebb	Mid	10/08/07	10:46	23	7.03	96.6	13.8	9.68	406	1.4
GSW-10	Ebb	Bottom	10/08/07	10:47	45	6.95	95.2	13.78	9.53	410	2.4
GSW-11	Slack Low	Shallow	10/08/07	12:36	2	6.83	98.1	13.64	9.8	418	0.2
GSW-11	Slack Low	Mid	10/08/07	12:37	15	6.86	96.2	13.67	9.71	417	0.4

Table 3.2
Cyanide Investigation Field Parameters

Station ID	Tide Cycle ID	Depth ID	Sampling Date	Field Parameter Sampling Time	Sample Depth (ft)	pH ()	Conductivity (µS/cm)	Temperature (C)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU)
GSW-11	Slack Low	Bottom	10/08/07	12:38	30	6.87	96	13.75	9.6	417	0.8
GSW-14	Ebb	Shallow	10/08/07	11:18	2	7.03	97.1	13.76	10.09	408	0
GSW-14	Ebb	Mid	10/08/07	11:19	23	6.98	96.8	13.72	9.7	409	0.7
GSW-14	Ebb	Bottom	10/08/07	11:20	45	6.97	97	13.74	9.61	409	1.4
GSW-15	Slack Low	Shallow	10/08/07	13:01	2	6.94	102.9	13.91	9.82	414	0.1
GSW-15	Slack Low	Mid	10/08/07	13:02	15	6.93	96.6	13.78	9.65	413	0.9
GSW-15	Slack Low	Bottom	10/08/07	13:03	33	6.91	98.8	13.75	9.6	414	3.4
GSW-16	Slack Low	Shallow	10/08/07	14:05	2	6.98	96.3	13.86	9.73	410	1.5
GSW-16	Slack Low	Mid	10/08/07	14:06	23	6.97	96.6	13.84	9.62	411	1.7
GSW-16	Slack Low	Bottom	10/08/07	14:07	46	6.94	101.3	13.75	9.6	411	2.8
GSW-16	Ebb	Shallow	10/08/07	9:26	2	6.89	94.6	13.78	9.73	417	0.2
GSW-16	Ebb	Mid	10/08/07	9:27	23	6.87	95	13.79	9.66	417	0.3
GSW-16	Ebb	Bottom	10/08/07	9:28	45	6.87	93.8	13.8	9.59	417	1.6
GSW-18	Slack Low	Shallow	10/08/07	14:35	2	6.96	96.4	13.91	9.79	411	1
GSW-18	Slack Low	Mid	10/08/07	14:36	23	6.99	96.7	13.94	9.68	412	1.1
GSW-18	Slack Low	Bottom	10/08/07	14:37	45	6.94	97.9	13.8	9.56	412	2.4
GSW-02	Slack High	Shallow	10/09/07	17:50	2	7.13 *	99.6	13.86	9.75	378	0.9
GSW-02	Slack High	Mid	10/09/07	17:51	25	7.11 *	100.7	13.8	9.61	379	1.1
GSW-02	Slack High	Bottom	10/09/07	17:52	49	7.09 *	119.2	13.82	9.52	380	2.2
GSW-17	Slack High	Shallow	10/09/07	17:25	2	7.15 *	101.4	13.82	9.76	373	1.3
GSW-17	Slack High	Mid	10/09/07	17:26	17	7.15 *	101.3	13.82	9.66	373	1
GSW-17	Slack High	Bottom	10/09/07	17:27	37	7.1 *	101	13.81	9.57	374	1.7
GSW-19	Slack High	Shallow	10/09/07	16:51	2	7.45 *	96.2	13.79	9.76	356	0.1
GSW-19	Slack High	Mid	10/09/07	16:52	25	7.34 *	98.4	13.79	9.62	360	1.7
GSW-19	Slack High	Bottom	10/09/07	16:53	48	7.28 *	100.2	13.8	9.53	362	2.4

Note:

* - Elevated pH readings were noted on October 9, the last day of sampling. Attempts to calibrate the pH probe were unsuccessful and thus pH readings for the three samples collected on the 9th should be considered estimates

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-01	GSW-01	GSW-01	GSW-02	GSW-02	GSW-02	GSW-03	GSW-03
			Sample ID:	GSW-01AE-071005	GSW-01ASH-071001	GSW-01ASL-071003	GSW-02AE-071004	GSW-02ASH-071009	GSW-02ASL-071002	GSW-03AE-071005	GSW-03ASH-071001
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	C	C	C	C	C	C	C	C
			Flow (degrees):	279.0	--	278.5	278.5	288.8	284.1	278.0	--
			Flow Direction:	West	--	West	West	West	West	West	--
			Velocity (mm/s):	142.5	--	157.8	170.3	37.5	27.5	149.8	--
			Tide:	E	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/05/2007	10/01/2007	10/03/2007	10/04/2007	10/09/2007	10/02/2007	10/05/2007	10/01/2007
			Sample Time:	7:25	10:15	7:40	7:35	17:55	7:45	8:05	11:01
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	**5 J**	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U	5 U
Total Cyanide	14		ug/l	3 U	**5 J**	3 U	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	**38.6**	29.1 U	**35.6**	**35.7**	**39.7**	**31.9**	**49.5**	31.1 U
Iron	--	--	ug/l	**231**	**185 J**	**252**	**262**	**228**	**264**	**246**	**189 J**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.6**	**1.5**	**2.1**	**1.7**	**1.9**	**1.7**	**1.6**	**2.2**
Total organic carbon	--	--	mg/l	**1.6**	**1.5**	**1.8**	**1.7**	**1.8**	**1.6**	**1.7**	**2.2**
Total suspended solids	--	--	mg/l	5 U	**5**	5 U	5 U	**5**	5 U	5 U	**5**

Note:
Data in table are final, validated results.
Bold results indicate detected concentrations.
Shaded results are detected concentrations above one or more JSCS Screening Level Value.
Grayed results are non detect results where the method detection limit is above one or more JSCS Screening Level Value.

Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result
River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-03	GSW-04	GSW-04	GSW-04	GSW-05	GSW-05	GSW-05	GSW-06
			Sample ID:	GSW-03ASL-071003	GSW-04AE-071004	GSW-04ASH-071004	GSW-04ASL-071002	GSW-05AE-071008	GSW-05ASH-071005	GSW-05ASL-071004	GSW-06AE-071008
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	C	C	C	C	C	C	C	C
			Flow (degrees):	276.8	278.4	280.9	100.6	275.9	276.2	279.8	279.9
			Flow Direction:	West	West	West	--	West	West	West	West
			Velocity (mm/s):	100.8	157.3	154.8	100.8	137.3	132.3	121.8	167.3
			Tide:	SL	E	SH	SL	E	SH	SL	E
			Sample Date:	10/03/2007	10/04/2007	10/04/2007	10/02/2007	10/08/2007	10/05/2007	10/04/2007	10/08/2007
			Sample Time:	8:20	8:20	14:26	8:23	8:35	15:15	9:17	9:00
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 UJ	10 U	5 U	5 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	**32.9**	**33.7**	**29.4**	**35.1**	**45**	**36.5**	**33.2**	**37.4**
Iron	--	--	ug/l	**294**	**268**	**169**	**262**	**240**	**167**	**297**	**251**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U	0.005 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.7**	**1.7**	**1.9**	**1.7**	**1.8**	**1.8**
Total organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.7**	**1.7**	**1.8**	**1.7**	**1.6**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U

Note:
Data in table are final, validated results.
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Grayed results are non detect results where the method detection limit is above one or more JSCS Screening Level Value.

Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
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River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-06	GSW-06	GSW-07	GSW-07	GSW-07	GSW-08	GSW-08	GSW-08
			Sample ID:	GSW-06ASH-071002	GSW-06ASL-071004	GSW-07AE-071005	GSW-07ASH-071001	GSW-07ASL-071003	GSW-08AE-071008	GSW-08ASH-071002	GSW-08ASL-071004
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	C	C	C	C	C	C	C	C
			Flow (degrees):	101.7	273.7	279.5	--	279.4	277.3	276.5	91.9
			Flow Direction:	East	West	West	--	West	West	West	East
			Velocity (mm/s):	71.3	51.8	165.5	--	41.0	191.0	88.8	25.0
			Tide:	SH	SL	E	SH	SL	E	SH	SL
			Sample Date:	10/02/2007	10/04/2007	10/05/2007	10/01/2007	10/03/2007	10/08/2007	10/02/2007	10/04/2007
			Sample Time:	10:32	9:51	8:46	11:52	9:06	10:00	11:15	10:35
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	**31.5**	**34.5**	**37.2**	33.2 U	**32**	**38.9**	**33.9**	**38.4**
Iron	--	--	ug/l	**255**	**265**	**251**	**191 J**	**269**	**243**	**206**	**264**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.8**	**1.7**	**1.6**	**1.5**	**2.2**	**1.7**	**1.7**	**3.1**
Total organic carbon	--	--	mg/l	**1.5**	**1.7**	**1.6**	**1.6**	**1.6**	**1.8**	**1.6**	**1.7**
Total suspended solids	--	--	mg/l	5 U	**5**	5 U	**5**	**5**	5 U	5 U	5 U

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U - ND; concentration shown is RL
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Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-09	GSW-09	GSW-09	GSW-10	GSW-10	GSW-10	GSW-11	GSW-11
			Sample ID:	GSW-09AE-071001	GSW-09ASH-071003	GSW-09ASL-071008	GSW-10AE-071008	GSW-10ASH-071002	GSW-10ASL-071005	GSW-11AE-071002	GSW-11ASH-071003
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	C	C	C	C	C	C	B	B
			Flow (degrees):	--	264.8	95.5	284.0	277.0	98.0	297.7	291.1
			Flow Direction:	--	West	East	West	--	East	Northwest	West
			Velocity (mm/s):	--	20.8	101.3	173.8	228.0	63.0	87.3	170.3
			Tide:	E	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/01/2007	10/03/2007	10/08/2007	10/08/2007	10/02/2007	10/05/2007	10/02/2007	10/03/2007
			Sample Time:	13:00	11:56	13:40	10:50	12:15	12:20	14:00	13:27
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	**10**	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	**10**	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	10 U	10 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	32.5 U	**32.8**	**49.7**	**38.3**	**38.7**	**38.8**	**33.4**	**33.5**
Iron	--	--	ug/l	**193 J**	**241**	**259**	**226**	**212**	**239**	**255**	**234**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.5**	**1.7**	**1.8**	**1.7**	**1.7**	**1.7**	**2.4**	**1.6**
Total organic carbon	--	--	mg/l	**1.6**	**1.6**	**1.7**	**1.8**	**1.6**	**1.6**	**1.6**	**1.6**
Total suspended solids	--	--	mg/l	**6**	5 U	**6**	**5**	5 U	5 U	5 U	5 U

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Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result
River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-11	GSW-12	GSW-12	GSW-12	GSW-13	GSW-13	GSW-13	GSW-14
			Sample ID:	GSW-11ASL-071008	GSW-12AE-071001	GSW-12ASH-071003	GSW-12ASL-071005	GSW-13AE-071001	GSW-13ASH-071002	GSW-13ASL-071005	GSW-14AE-071008
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	B	B	B	B	B	B	B	B
			Flow (degrees):	174.6	--	292.9	291.3	--	292.9	293.0	287.8
			Flow Direction:	South	--	Northwest	West	--	Northwest	Northwest	West
			Velocity (mm/s):	26.3	--	143.5	74.0	--	125.3	51.5	117.8
			Tide:	SL	E	SH	SL	E	SH	SL	E
			Sample Date:	10/08/2007	10/01/2007	10/03/2007	10/05/2007	10/01/2007	10/02/2007	10/05/2007	10/08/2007
			Sample Time:	12:40	13:40	12:40	9:56	15:30	13:14	10:35	11:22
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	10 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	**4 J**	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	10 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U
Total Cyanide	14		ug/l	3 U	**4 J**	3 U	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	**35.7**	37.9 U	**40.8**	**42.8**	36.2 U	**36.5**	**40.3**	**38.3**
Iron	--	--	ug/l	**239**	**188 J**	**173**	**261**	**226 J**	**280**	**279**	**220**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**2.4**	**1.7**	**1.7**	**1.6**	**1.7**	**1.6**	**1.7**
Total organic carbon	--	--	mg/l	**1.8**	**2.5**	**1.6**	**1.6**	**1.7**	**1.5**	**1.5**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	5 U	**5**	5 U	5 U	5 U	**5**

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Other Analyte Notes
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SL - Time period surrounding low tide

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-14	GSW-14	GSW-15	GSW-15	GSW-15	GSW-16	GSW-16	GSW-16
			Sample ID:	GSW-14ASH-071005	GSW-14ASL-071002	GSW-15AE-071002	GSW-15ASH-071004	GSW-15ASL-071008	GSW-16AE-071008	GSW-16ASH-071004	GSW-16ASL-071008
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	B	B	B	B	B	A	A	A
			Flow (degrees):	93.3	99.4	293.1	102.1	116.8	194.8	273.4	99.6
			Flow Direction:	East	East	Northwest	East	Southeast	South	West	East
			Velocity (mm/s):	36.0	207.3	72.3	46.8	72.5	129.8	93.0	177.5
			Tide:	SH	SL	E	SH	SL	E	SH	SL
			Sample Date:	10/05/2007	10/02/2007	10/02/2007	10/04/2007	10/08/2007	10/08/2007	10/04/2007	10/08/2007
			Sample Time:	14:15	9:14	14:54	13:06	13:05	9:30	13:46	14:10
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	10 U	5 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	3 U	**7 J**	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	10 U	5 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	**7 J**	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	**41.5**	**31**	**37.7**	**31.4**	**39.7**	**39.6**	34.2 U	**39.9**
Iron	--	--	ug/l	**170**	**239**	**257**	**207**	**222**	**254**	**178**	**217**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.05 U	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.8**	**1.7**	**1.7**	**1.7**	**1.8**	**1.7**	**1.7**
Total organic carbon	--	--	mg/l	**1.5**	**1.6**	**1.5**	**2.2**	**1.8**	**1.5**	**1.7**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	5 U	5 U	**6**	**6**	5 U	5 U

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Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-17	GSW-17	GSW-17	GSW-18	GSW-18	GSW-18	GSW-19	GSW-19
			Sample ID:	GSW-17AE-071003	GSW-17ASH-071009	GSW-17ASL-071003	GSW-18AE-071001	GSW-18ASH-071005	GSW-18ASL-071008	GSW-19AE-071005	GSW-19ASH-071009
			Sample Depth (ft):	2	2	2	2	2	2	2	2
			Nearest ADCP:	A	A	A	A	A	A	A	A
			Flow (degrees):	116.1	270.6	71.7	--	177.6	112.1	192.0	190.2
			Flow Direction:	Southeast	West	East	--	South	East	South	South
			Velocity (mm/s):	55.0	30.0	144.5	--	156.8	255.0	160.0	18.0
			Tide:	E	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/03/2007	10/09/2007	10/03/2007	10/01/2007	10/05/2007	10/08/2007	10/05/2007	10/09/2007
			Sample Time:	15:15	17:28	10:04	16:17	14:45	14:40	9:18	16:55
Cyanide (dissolved)											
Amenable Cyanide	14		ug/l	3 U	3 U	**3 J**	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	**3 J**	3 U	3 U	3 U	3 U	3 U
Cyanide (total)											
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other											
Iron (dissolved)	--	--	ug/l	**33.2**	**41.1**	**33.7**	32.7 U	**38.3**	**36.7**	**41.8**	**36.8**
Iron	--	--	ug/l	**217**	**255**	**262**	**192 J**	**184**	**169**	**270**	**209**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.9**	**1.9**	**1.7**	**2.6**	**1.6**	**1.8**	**1.7**	**1.8**
Total organic carbon	--	--	mg/l	**1.7**	**1.8**	**1.6**	**2.7**	**1.5**	**1.7**	**1.6**	**1.7**
Total suspended solids	--	--	mg/l	5 U	**6**	5 U	5 U	5 U	**5**	**6**	5 U

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Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.3
Cyanide Investigation Shallow Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-19	GSW-20	GSW-20	GSW-20
			Sample ID:	GSW-19ASL-071005	GSW-20AE-071002	GSW-20ASH-071003	GSW-20ASL-071004
			Sample Depth (ft):	2	2	2	2
			Nearest ADCP:	A	A	A	A
			Flow (degrees):	106.1	267.1	264.5	99.7
			Flow Direction:	East	West	West	East
			Velocity (mm/s):	205.0	240.3	104.0	199.5
			Tide:	SL	E	SH	SL
			Sample Date:	10/05/2007	10/02/2007	10/03/2007	10/04/2007
			Sample Time:	11:19	15:45	14:22	11:12
Cyanide (dissolved)							
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Cyanide (total)							
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Other							
Iron (dissolved)	--	--	ug/l	**40.3**	**39.8**	**31.8**	36.8 U
Iron	--	--	ug/l	**247**	**244**	**220**	**212**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.7**	**2.6**	**1.8**
Total organic carbon	--	--	mg/l	**1.6**	**1.5**	**1.7**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	5 U	5 U

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Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-01	GSW-01	GSW-01	GSW-02	GSW-02	GSW-02	GSW-03
			Sample ID:	GSW-01BE-071005	GSW-01BSH-071001	GSW-01BSL-071003	GSW-02BE-071004	GSW-02BSH-071009	GSW-02BSL-071002	GSW-03BE-071005
			Sample Depth (ft):	23	25	24	23	25	24	15
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	279.0	--	278.5	278.5	288.8	284.1	278.0
			Flow Direction:	West	--	West	West	West	West	West
			Velocity (mm/s):	142.5	--	157.8	170.3	37.5	27.5	149.8
			Tide:	E	SH	SL	E	SH	SL	E
			Sample Date:	10/05/2007	10/01/2007	10/03/2007	10/04/2007	10/09/2007	10/02/2007	10/05/2007
			Sample Time:	7:35	10:20	7:50	7:45	18:00	7:51	8:13
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	**10 J**	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
Total Cyanide	14		ug/l	3 U	**10 J**	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**82.6**	32 U	**34.5**	**32.5**	**35.2**	**30**	**39.7**
Iron	--	--	ug/l	**254**	**209 J**	**338**	**282**	**270**	**267**	**224**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.6**	**2.4**	**1.8**	**1.7**	**1.9**	**2.3**	**1.6**
Total organic carbon	--	--	mg/l	**1.6**	**2.3**	**1.7**	**1.6**	**1.7**	**1.6**	**1.6**
Total suspended solids	--	--	mg/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U

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Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-03	GSW-03	GSW-04	GSW-04	GSW-04	GSW-05	GSW-05
			Sample ID:	GSW-03BSH-071001	GSW-03BSL-071003	GSW-04BE-071004	GSW-04BSH-071004	GSW-04BSL-071002	GSW-05BE-071008	GSW-05BSH-071005
			Sample Depth (ft):	16	16	23	25	25	26	27
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	--	276.8	278.4	280.9	100.6	275.9	276.2
			Flow Direction:	--	West	West	West	--	West	West
			Velocity (mm/s):	--	100.8	157.3	154.8	100.8	137.3	132.3
			Tide:	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/01/2007	10/03/2007	10/04/2007	10/04/2007	10/02/2007	10/08/2007	10/05/2007
			Sample Time:	11:11	8:30	8:31	14:35	8:30	8:40	15:20
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 UJ	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	32.9 U	**34.5**	**29.5**	**29.3**	**30.7**	**38.7**	**35.5**
Iron	--	--	ug/l	**197 J**	**283**	**322**	**193**	**299**	**255**	**234**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.6**	**1.7**	**1.7**	**1.7**	**1.6**	**1.7**	**1.7**
Total organic carbon	--	--	mg/l	**1.5**	**1.7**	**1.6**	**1.7**	**1.7**	**1.8**	**1.5**
Total suspended solids	--	--	mg/l	**6**	**6**	**6**	5 U	5 U	5 U	**6**

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Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-05	GSW-06	GSW-06	GSW-06	GSW-07	GSW-07	GSW-07
			Sample ID:	GSW-05BSL-071004	GSW-06BE-071008	GSW-06BSH-071002	GSW-06BSL-071004	GSW-07BE-071005	GSW-07BSH-071001	GSW-07BSL-071003
			Sample Depth (ft):	25	13	13	16	22	23	27
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	279.8	279.9	101.7	273.7	279.5	--	279.4
			Flow Direction:	West	West	East	West	West	--	West
			Velocity (mm/s):	121.8	167.3	71.3	51.8	165.5	--	41.0
			Tide:	SL	E	SH	SL	E	SH	SL
			Sample Date:	10/04/2007	10/08/2007	10/02/2007	10/04/2007	10/05/2007	10/01/2007	10/03/2007
			Sample Time:	9:26	9:05	10:43	10:02	8:53	12:04	9:15
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	10 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	10 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**33.1**	**38.1**	**32.8**	**37.8**	**38.3**	32.1 U	**35.2**
Iron	--	--	ug/l	**307**	**252**	**241**	**358**	**246**	**206 J**	**251**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.8**	**1.7**	**1.6**	**1.7**	**1.7**	**1.8**
Total organic carbon	--	--	mg/l	**2**	**1.7**	**1.6**	**1.6**	**1.7**	**1.8**	**1.7**
Total suspended solids	--	--	mg/l	**6**	5 U	5 U	**6**	**5**	5 U	**6**

Note:

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Bold results indicate detected concentrations.

Shaded results are detected concentrations above one or more JSCS Screening Level Value.

Grayed results are non detect results where the method detection limit is above one or more JSCS Screening Level Value.

Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-08	GSW-08	GSW-08	GSW-09	GSW-09	GSW-09	GSW-10
			Sample ID:	GSW-08BE-071008	GSW-08BSH-071002	GSW-08BSL-071004	GSW-09BE-071001	GSW-09BSH-071003	GSW-09BSL-071008	GSW-10BE-071008
			Sample Depth (ft):	22	24	23	15	17	13	23
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	277.3	276.5	91.9	--	264.8	95.5	284.0
			Flow Direction:	West	West	East	--	West	East	West
			Velocity (mm/s):	191.0	88.8	25.0	--	20.8	101.3	173.8
			Tide:	E	SH	SL	E	SH	SL	E
			Sample Date:	10/08/2007	10/02/2007	10/04/2007	10/01/2007	10/03/2007	10/08/2007	10/08/2007
			Sample Time:	10:07	11:24	10:45	13:05	12:04	13:45	10:55
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 UJ	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	10 U	5 U	5 U	5 U	5 U	10 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	**10**	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	**10 J**	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	10 U	5 U	5 U	5 U	5 U	10 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	**20**	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**37.2**	**34.5**	**32.6**	33.7 U	**31.7**	**38.2**	**39.8**
Iron	--	--	ug/l	**262**	**275**	**311**	**236 J**	**234**	**268**	**262**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.9**	**1.7**	**2.2**	**1.6**	**1.7**	**1.8**
Total organic carbon	--	--	mg/l	**1.8**	**1.5**	**1.6**	**2.2**	**1.7**	**1.7**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	**5**	**6**	**5**	**7**	5 U

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Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-10	GSW-10	GSW-11	GSW-11	GSW-11	GSW-12	GSW-12
			Sample ID:	GSW-10BSH-071002	GSW-10BSL-071005	GSW-11BE-071002	GSW-11BSH-071003	GSW-11BSL-071008	GSW-12BE-071001	GSW-12BSH-071003
			Sample Depth (ft):	24	23	18	17	15	23	23
			Nearest ADCP:	C	C	B	B	B	B	B
			Flow (degrees):	277.0	98.0	297.7	291.1	174.6	--	292.9
			Flow Direction:	--	East	Northwest	West	South	--	Northwest
			Velocity (mm/s):	228.0	63.0	87.3	170.3	26.3	--	143.5
			Tide:	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/02/2007	10/05/2007	10/02/2007	10/03/2007	10/08/2007	10/01/2007	10/03/2007
			Sample Time:	12:24	12:27	14:09	13:37	12:45	14:00	12:50
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	**10**	3 U	3 U	**20 J**	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	**10**	3 U	3 U	**20**	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**31.6**	**40.7**	**37.9**	**32.8**	**41.1**	31.1 U	**38.5**
Iron	--	--	ug/l	**223**	**283**	**311**	**225**	**268**	**221 J**	**236**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.005 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.8**	**1.7**	**1.8**	**1.7**	**1.7**	**2.1**	**1.7**
Total organic carbon	--	--	mg/l	**1.5**	**1.6**	**1.7**	**1.6**	**1.7**	**2.1**	**1.6**
Total suspended solids	--	--	mg/l	5 U	**6**	**5**	**5**	**5**	**5**	5 U

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Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-12	GSW-13	GSW-13	GSW-13	GSW-14	GSW-14	GSW-14
			Sample ID:	GSW-12BSL-071005	GSW-13BE-071001	GSW-13BSH-071002	GSW-13BSL-071005	GSW-14BE-071008	GSW-14BSH-071005	GSW-14BSL-071002
			Sample Depth (ft):	22	17	17	13	23	24	24
			Nearest ADCP:	B	B	B	B	B	B	B
			Flow (degrees):	291.3	--	292.9	293.0	287.8	93.3	99.4
			Flow Direction:	West	--	Northwest	Northwest	West	East	East
			Velocity (mm/s):	74.0	--	125.3	51.5	117.8	36.0	207.3
			Tide:	SL	E	SH	SL	E	SH	SL
			Sample Date:	10/05/2007	10/01/2007	10/02/2007	10/05/2007	10/08/2007	10/05/2007	10/02/2007
			Sample Time:	10:05	15:36	13:23	10:43	11:30	14:21	9:22
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**40.9**	33.3 U	**33.4**	**38.2**	**39.3**	**37.8**	**32.2**
Iron	--	--	ug/l	**316**	**203 J**	**312**	**258**	**255**	**199**	**234**
Sulfide	--	--	mg/l	0.05 U	0.005 U	**0.05 U**	0.05 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.6**	**1.6**	**1.6**	**1.7**	**1.8**	**1.7**	**1.7**
Total organic carbon	--	--	mg/l	**1.5**	**1.7**	**1.6**	**1.5**	**1.8**	**1.6**	**1.5**
Total suspended solids	--	--	mg/l	5 U	**6**	5 U	**6**	**6**	5 U	5 U

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Cyanide Notes
U - ND; concentration shown is MDL
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Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
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Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-15	GSW-15	GSW-15	GSW-16	GSW-16	GSW-16	GSW-17
			Sample ID:	GSW-15BE-071002	GSW-15BSH-071004	GSW-15BSL-071008	GSW-16BE-071008	GSW-16BSH-071004	GSW-16BSL-071008	GSW-17BE-071003
			Sample Depth (ft):	18	17	15	23	24	23	18
			Nearest ADCP:	B	B	B	A	A	A	A
			Flow (degrees):	293.1	102.1	116.8	194.8	273.4	99.6	116.1
			Flow Direction:	Northwest	East	Southeast	South	West	East	Southeast
			Velocity (mm/s):	72.3	46.8	72.5	129.8	93.0	177.5	55.0
			Tide:	E	SH	SL	E	SH	SL	E
			Sample Date:	10/02/2007	10/04/2007	10/08/2007	10/08/2007	10/04/2007	10/08/2007	10/03/2007
			Sample Time:	15:05	13:14	13:12	9:35	13:55	14:15	15:22
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	10 U	10 U	5 U	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	**90**	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	10 U	10 U	5 U	10 U	5 U
Total Cyanide	14		ug/l	**90**	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**30.9**	**41.1**	**45.3**	**39.2**	33 U	**45.9**	**35.2**
Iron	--	--	ug/l	**333**	**274**	**295**	**260**	**209**	**269**	**262**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.7**	**1.8**	**1.7**	**1.6**	**1.7**
Total organic carbon	--	--	mg/l	**1.6**	**1.7**	**1.8**	**1.7**	**1.7**	**1.7**	**1.6**
Total suspended solids	--	--	mg/l	**5**	**6**	**6**	5 U	5 U	**5**	**6**

Note:

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Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-17	GSW-17	GSW-18	GSW-18	GSW-18	GSW-19	GSW-19
			Sample ID:	GSW-17BSH-071009	GSW-17BSL-071003	GSW-18BE-071001	GSW-18BSH-071005	GSW-18BSL-071008	GSW-19BE-071005	GSW-19BSH-071009
			Sample Depth (ft):	17	17	23	24	23	23	25
			Nearest ADCP:	A	A	A	A	A	A	A
			Flow (degrees):	270.6	71.7	--	177.6	112.1	192.0	190.2
			Flow Direction:	West	East	--	South	East	South	South
			Velocity (mm/s):	30.0	144.5	--	156.8	255.0	160.0	18.0
			Tide:	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/09/2007	10/03/2007	10/01/2007	10/05/2007	10/08/2007	10/05/2007	10/09/2007
			Sample Time:	17:34	10:13	16:30	14:50	14:50	9:30	17:03
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**40.1**	**33.8**	33 U	**44.2**	**36.9**	**41.8**	**38.2**
Iron	--	--	ug/l	**263**	**274**	**225 J**	**225**	**204**	**317**	**277**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.9**	**1.7**	**1.5**	**1.7**	**1.7**	**1.6**	**1.8**
Total organic carbon	--	--	mg/l	**1.7**	**1.6**	**1.6**	**1.5**	**1.7**	**1.5**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	**5**	5 U	5 U	**5**	5 U

Note:

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Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.4
Cyanide Investigation Mid-Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-19	GSW-20	GSW-20	GSW-20
			Sample ID:	GSW-19BSL-071005	GSW-20BE-071002	GSW-20BSH-071003	GSW-20BSL-071004
			Sample Depth (ft):	22	23	23	23
			Nearest ADCP:	A	A	A	A
			Flow (degrees):	106.1	267.1	264.5	99.7
			Flow Direction:	East	West	West	East
			Velocity (mm/s):	205.0	240.3	104.0	199.5
			Tide:	SL	E	SH	SL
			Sample Date:	10/05/2007	10/02/2007	10/03/2007	10/04/2007
			Sample Time:	11:26	15:55	14:33	11:20
Cyanide (dissolved)							
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Cyanide (total)							
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U
Other							
Iron (dissolved)	--	--	ug/l	**37.3**	**35.4**	**33.2**	37.5 U
Iron	--	--	ug/l	**289**	**245**	**220**	**288**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.5**	**1.8**	**1.7**
Total organic carbon	--	--	mg/l	**1.6**	**1.5**	**1.6**	**1.8**
Total suspended solids	--	--	mg/l	**6**	5 U	5 U	**5**

Note:

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Bold results indicate detected concentrations.

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Grayed results are non detect results where the method detection limit is above one or more JSCS Screening Level Value.

Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result

River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.5
Cyanide Investigation Near Bottom Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-01	GSW-01	GSW-01	GSW-02	GSW-02	GSW-02	GSW-03
			Sample ID:	GSW-01CE-071005	GSW-01CSH-071001	GSW-01CSL-071003	GSW-02CE-071004	GSW-02CSH-071009	GSW-02CSL-071002	GSW-03CE-071005
			Sample Depth (ft):	46	49	47	45	49	47	29
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	279.0	--	278.5	278.5	288.8	284.1	278.0
			Flow Direction:	West	--	West	West	West	West	West
			Velocity (mm/s):	142.5	--	157.8	170.3	37.5	27.5	149.8
			Tide:	E	SH	SL	E	SH	SL	E
			Sample Date:	10/05/2007	10/01/2007	10/03/2007	10/04/2007	10/09/2007	10/02/2007	10/05/2007
			Sample Time:	7:48	10:40	8:05	8:00	18:15	8:05	8:20
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	**3 J**	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
Total Cyanide	14		ug/l	3 U	**3 J**	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**36**	37.9 U	**30.8**	**35.6**	**35.8**	**31.5**	**39.8**
Iron	--	--	ug/l	**266**	**286 J**	**323**	**334**	**343**	**240**	**240**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.5**	**1.6**	**1.7**	**1.9**	**1.7**	**1.5**
Total organic carbon	--	--	mg/l	**1.6**	**1.5**	**1.7**	**1.7**	**1.8**	**1.7**	**1.6**
Total suspended solids	--	--	mg/l	**5**	**8**	5 U	**5**	**6**	5 U	**6**

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Shallow - Top 2' of river
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E- Time period during which the tide is falling
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Table 3.5
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Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-03	GSW-03	GSW-04	GSW-04	GSW-04	GSW-05	GSW-05
			Sample ID:	GSW-03CSH-071001	GSW-03CSL-071003	GSW-04CE-071004	GSW-04CSH-071004	GSW-04CSL-071002	GSW-05CE-071008	GSW-05CSH-071005
			Sample Depth (ft):	31	31	44	48	49	52	54
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	--	276.8	278.4	280.9	100.6	275.9	276.2
			Flow Direction:	--	West	West	West	--	West	West
			Velocity (mm/s):	--	100.8	157.3	154.8	100.8	137.3	132.3
			Tide:	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/01/2007	10/03/2007	10/04/2007	10/04/2007	10/02/2007	10/08/2007	10/05/2007
			Sample Time:	11:25	8:50	8:41	14:45	8:44	8:50	15:30
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 UJ	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	32.7 U	**33.5**	**33.2**	**29.4**	**36.9**	**37.1**	**47.1**
Iron	--	--	ug/l	**210 J**	**287**	**304**	**300**	**294**	**292**	**264**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.6**	**1.8**	**1.7**	**1.7**	**1.7**	**1.7**	**1.6**
Total organic carbon	--	--	mg/l	**1.6**	**1.6**	**1.6**	**1.6**	**1.5**	**1.7**	**1.5**
Total suspended solids	--	--	mg/l	**5**	**6**	**7**	5 U	**5**	5 U	**6**

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Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-05	GSW-06	GSW-06	GSW-06	GSW-07	GSW-07	GSW-07
			Sample ID:	GSW-05CSL-071004	GSW-06CE-071008	GSW-06CSH-071002	GSW-06CSL-071004	GSW-07CE-071005	GSW-07CSH-071001	GSW-07CSL-071003
			Sample Depth (ft):	50	28	25	32	43	46	44
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	279.8	279.9	101.7	273.7	279.5	--	279.4
			Flow Direction:	West	West	East	West	West	--	West
			Velocity (mm/s):	121.8	167.3	71.3	51.8	165.5	--	41.0
			Tide:	SL	E	SH	SL	E	SH	SL
			Sample Date:	10/04/2007	10/08/2007	10/02/2007	10/04/2007	10/05/2007	10/01/2007	10/03/2007
			Sample Time:	9:40	9:12	10:53	10:12	9:00	12:20	9:29
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	10 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	10 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**34.2**	**38.3**	**32.7**	**41.7**	**38.1**	32.9 U	**38.7**
Iron	--	--	ug/l	**357**	**281**	**240**	**308**	**285**	**230 J**	**299**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.005 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.7**	**1.8**	**1.7**	**2.2**	**1.6**
Total organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.6**	**1.7**	**1.7**	**2.3**	**1.6**
Total suspended solids	--	--	mg/l	**5**	5 U	5 U	**8**	**6**	5 U	**7**

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Cyanide Investigation Near Bottom Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-08	GSW-08	GSW-08	GSW-09	GSW-09	GSW-09	GSW-10
			Sample ID:	GSW-08CE-071008	GSW-08CSH-071002	GSW-08CSL-071004	GSW-09CE-071001	GSW-09CSH-071003	GSW-09CSL-071008	GSW-10CE-071008
			Sample Depth (ft):	44	47	44	31	33	25	45
			Nearest ADCP:	C	C	C	C	C	C	C
			Flow (degrees):	277.3	276.5	91.9	--	264.8	95.5	284.0
			Flow Direction:	West	West	East	--	West	East	West
			Velocity (mm/s):	191.0	88.8	25.0	--	20.8	101.3	173.8
			Tide:	E	SH	SL	E	SH	SL	E
			Sample Date:	10/08/2007	10/02/2007	10/04/2007	10/01/2007	10/03/2007	10/08/2007	10/08/2007
			Sample Time:	10:15	11:40	10:55	13:11	12:13	13:52	11:05
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	**110 J**	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	10 U	5 U	5 U	5 U	5 U	10 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	**140**	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	10 J	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	10 U	5 U	5 U	5 U	5 U	10 U	10 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	**10**	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**40.7**	**31.3**	**33**	38.8 U	**32.9**	**37.5**	**39.4**
Iron	--	--	ug/l	**280**	**248**	**386**	**225 J**	**228**	**403**	**316**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.005 U	0.005 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.8**	**1.6**	**1.7**	**2.1**	**1.6**	**1.6**	**1.7**
Total organic carbon	--	--	mg/l	**1.7**	**1.6**	**1.7**	**2.1**	**1.7**	**1.6**	**1.7**
Total suspended solids	--	--	mg/l	5 U	5 U	**7**	**5**	5 U	**14**	**8**

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Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-10	GSW-10	GSW-11	GSW-11	GSW-11	GSW-12	GSW-12
			Sample ID:	GSW-10CSH-071002	GSW-10CSL-071005	GSW-11CE-071002	GSW-11CSH-071003	GSW-11CSL-071008	GSW-12CE-071001	GSW-12CSH-071003
			Sample Depth (ft):	48	46	33	33	30	46	45
			Nearest ADCP:	C	C	B	B	B	B	B
			Flow (degrees):	277.0	98.0	297.7	291.1	174.6	--	292.9
			Flow Direction:	--	East	Northwest	West	South	--	Northwest
			Velocity (mm/s):	228.0	63.0	87.3	170.3	26.3	--	143.5
			Tide:	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/02/2007	10/05/2007	10/02/2007	10/03/2007	10/08/2007	10/01/2007	10/03/2007
			Sample Time:	12:38	12:37	14:25	13:47	12:50	14:19	13:00
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**33.9**	**38.2**	**36.9**	**32.6**	**39.9**	31.3 U	**31.4**
Iron	--	--	ug/l	**259**	**337**	**315**	**256**	**335**	**297 J**	**287**
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.005 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.8**	**1.7**	**1.7**	**1.7**	**1.7**	**1.5**	**1.7**
Total organic carbon	--	--	mg/l	**1.5**	**1.5**	**1.5**	**1.6**	**1.8**	**1.5**	**1.6**
Total suspended solids	--	--	mg/l	5 U	**6**	**6**	5 U	**8**	**8**	**6**

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Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-12	GSW-13	GSW-13	GSW-13	GSW-14	GSW-14	GSW-14
			Sample ID:	GSW-12CSL-071005	GSW-13CE-071001	GSW-13CSH-071002	GSW-13CSL-071005	GSW-14CE-071008	GSW-14CSH-071005	GSW-14CSL-071002
			Sample Depth (ft):	44	33	34	26	45	48	48
			Nearest ADCP:	B	B	B	B	B	B	B
			Flow (degrees):	291.3	--	292.9	293.0	287.8	93.3	99.4
			Flow Direction:	West	--	Northwest	Northwest	West	East	East
			Velocity (mm/s):	74.0	--	125.3	51.5	117.8	36.0	207.3
			Tide:	SL	E	SH	SL	E	SH	SL
			Sample Date:	10/05/2007	10/01/2007	10/02/2007	10/05/2007	10/08/2007	10/05/2007	10/02/2007
			Sample Time:	10:15	15:45	13:38	10:55	11:40	14:30	9:34
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	**110**	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**40.2**	35 U	**35.9**	**42.1**	**38.4**	**41.7**	**29.7**
Iron	--	--	ug/l	**354**	**275 J**	**282**	**281**	**336**	**258**	**269**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.5**	**1.5**	**1.6**	**1.7**	**1.6**	**1.5**
Total organic carbon	--	--	mg/l	**1.6**	**1.5**	**1.5**	**1.5**	**1.7**	**1.5**	**1.4**
Total suspended solids	--	--	mg/l	**6**	**8**	**6**	**6**	5 U	**5**	5 U

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			Station:	GSW-15	GSW-15	GSW-15	GSW-16	GSW-16	GSW-16	GSW-17
			Sample ID:	GSW-15CE-071002	GSW-15CSH-071004	GSW-15CSL-071008	GSW-16CE-071008	GSW-16CSH-071004	GSW-16CSL-071008	GSW-17CE-071003
			Sample Depth (ft):	36	35	33	45	47	46	35
			Nearest ADCP:	B	B	B	A	A	A	A
			Flow (degrees):	293.1	102.1	116.8	194.8	273.4	99.6	116.1
			Flow Direction:	Northwest	East	Southeast	South	West	East	Southeast
			Velocity (mm/s):	72.3	46.8	72.5	129.8	93.0	177.5	55.0
			Tide:	E	SH	SL	E	SH	SL	E
			Sample Date:	10/02/2007	10/04/2007	10/08/2007	10/08/2007	10/04/2007	10/08/2007	10/03/2007
			Sample Time:	15:15	13:25	13:21	9:43	14:10	14:20	15:33
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	10 U	10 U	5 U	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	10 U	10 U	5 U	10 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**48.6**	36.9 U	**38.5**	**39.6**	35.1 U	**49.6**	**33.5**
Iron	--	--	ug/l	**307**	**274**	**294**	**411**	**378**	**304**	**311**
Sulfide	--	--	mg/l	0.05 U	0.005 U	0.05 U	0.05 U	0.005 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.5**	**1.8**	**1.7**	**1.7**	**1.7**	**1.7**	**2.2**
Total organic carbon	--	--	mg/l	**1.6**	**1.7**	**1.7**	**1.8**	**1.7**	**1.7**	**1.8**
Total suspended solids	--	--	mg/l	5 U	**6**	**7**	**6**	**7**	**8**	**7**

Note:
Data in table are final, validated results.
Bold results indicate detected concentrations.
Shaded results are detected concentrations above one or more JSCS Screening Level Value.
Grayed results are non detect results where the method detection limit is above one or more JSCS Screening Level Value.

Cyanide Notes
U - ND; concentration shown is MDL
J - Estimated result

Other Analyte Notes
U - ND; concentration shown is RL
J - Estimated result
River Flow - Average direction recorded for station during time of sampling at acoustic doppler current profiler (ADCP). Reported in directional degrees with 0 as north flowing.

Depth Category
Shallow - Top 2' of river
Mid - Approximately half way to river bottom
Near Bottom - Within 1' of mudlilne

Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.5
Cyanide Investigation Near Bottom Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-17	GSW-17	GSW-18	GSW-18	GSW-18	GSW-19	GSW-19
			Sample ID:	GSW-17CSH-071009	GSW-17CSL-071003	GSW-18CE-071001	GSW-18CSH-071005	GSW-18CSL-071008	GSW-19CE-071005	GSW-19CSH-071009
			Sample Depth (ft):	37	34	46	47	45	45	48
			Nearest ADCP:	A	A	A	A	A	A	A
			Flow (degrees):	270.6	71.7	--	177.6	112.1	192.0	190.2
			Flow Direction:	West	East	--	South	East	South	South
			Velocity (mm/s):	30.0	144.5	--	156.8	255.0	160.0	18.0
			Tide:	SH	SL	E	SH	SL	E	SH
			Sample Date:	10/09/2007	10/03/2007	10/01/2007	10/05/2007	10/08/2007	10/05/2007	10/09/2007
			Sample Time:	17:40	10:25	16:40	14:59	15:00	9:40	17:15
Cyanide (dissolved)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)										
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 UJ	5 U	10 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Other										
Iron (dissolved)	--	--	ug/l	**38.7**	**40.4**	33.4 U	**36.7**	**36.4**	**40.6**	**38.3**
Iron	--	--	ug/l	**299**	**265**	**327**	**284**	**384**	**387**	**317**
Sulfide	--	--	mg/l	0.005 U	0.05 U	0.005 U	0.05 U	0.05 U	0.05 U	0.005 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.6**	**1.6**	**1.7**	**1.7**	**1.9**
Total organic carbon	--	--	mg/l	**1.7**	**1.7**	**1.6**	**1.6**	**1.7**	**1.6**	**1.7**
Total suspended solids	--	--	mg/l	5 U	**5**	**9**	**6**	**8**	**6**	5 U

Note:
Data in table are final, validated results.
Bold results indicate detected concentrations.
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Cyanide Notes
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U - ND; concentration shown is RL
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Shallow - Top 2' of river
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Tide Category
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SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 3.5
Cyanide Investigation Near Bottom Depth
Surface Water Chemistry Data

	JSCS Lowest Human Health Value dissolved	JSCS Lowest Ecological Value dissolved	Study:	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide	2007 Cyanide
			Station:	GSW-19	GSW-20	GSW-20	GSW-20	QAQC	QAQC
			Sample ID:	GSW-19CSL-071005	GSW-20CE-071002	GSW-20CSH-071003	GSW-20CSL-071004	GSW-DB	GSW-RB
			Sample Depth (ft):	44	46	45	45		
			Nearest ADCP:	A	A	A	A		
			Flow (degrees):	106.1	267.1	264.5	99.7		
			Flow Direction:	East	West	West	East		
			Velocity (mm/s):	205.0	240.3	104.0	199.5		
			Tide:	SL	E	SH	SL		
			Sample Date:	10/05/2007	10/02/2007	10/03/2007	10/04/2007	10/03/2007	10/03/2007
			Sample Time:	11:36	16:07	14:45	11:35		
Cyanide (dissolved)									
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U		
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U
Cyanide (total)									
Amenable Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U
Free Cyanide		5.2	ug/l	5 U	5 U	5 U	5 U	5 U	5 U
Total Cyanide	14		ug/l	3 U	3 U	3 U	3 U	3 U	3 U
Other									
Iron (dissolved)	--	--	ug/l	**42.1**	**32.3**	**33.2**	37.6 U		
Iron	--	--	ug/l	**319**	**316**	**389**	**438**	20 U	20 U
Sulfide	--	--	mg/l	0.05 U	0.05 U	0.05 U	0.005 U	0.05 U	0.05 U
Dissolved organic carbon	--	--	mg/l	**1.7**	**1.6**	**1.7**	**1.7**		
Total organic carbon	--	--	mg/l	**1.6**	**1.5**	**1.6**	**1.9**	0.5 U	0.5 U
Total suspended solids	--	--	mg/l	**5**	5 U	**7**	**9**	5 U	5 U

Note:
Data in table are final, validated results.
Bold results indicate detected concentrations.
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Tide Category
E- Time period during which the tide is falling
SH - Time period surrounding high tide
SL - Time period surrounding low tide

Table 4.1
Seepage Meter Collection Information and Sediment Types

Station	Position		Deployment Period		Data Window		Bottom Type	Water Depth (ft)
	Lat	Long	Start	End	Start	End		
GS-B2	45.58111	122.76058	10/2/2007 15:00	10/5/2007 16:00	10/2/2007 21:00	10/5/2007 13:28	Silty clay	32
GS-B5	45.579953	122.757519	10/4/2007 16:50	10/6/2007 14:38	n/a	n/a	Sandy silt	27
GS-B7	45.57943	122.75607	10/2/2007 17:45	10/5/2007 14:30	10/2/2007 23:00	10/5/2007 14:15	Silty clay	32
GS-C5	45.580419	122.756923	10/4/2007 16:00	10/6/2007 14:16	10/4/2007 16:00	10/6/2007 14:15	Silty sand	46
GS-C7	45.579775	122.755748	10/3/2007 16:11	10/6/2007 10:55	10/3/2007 17:00	10/5/2007 12:07	Sandy silt	46
GS-D5	45.5801	122.75463	10/3/2007 12:38	10/6/2007 10:00	10/3/2007 19:00	10/6/2007 9:45	Sandy silt	46
GS-PC1A[a]	45.579966	122.758226	10/4/2007 16:00	10/6/2007 15:02	n/a	n/a	Silt	17
GS-PC1B[a]	45.579966	122.758226	10/4/2007 15:30	10/6/2007 15:06	10/4/2007 18:00	10/6/2007 14:45	Silt	17
GCSeep-2A	45.58075	-122.76065	NA	NA	8/8/2005 12:15	8/9/2005 8:15	Silt	3.3
GCSeep-3A	45.5805	-122.75997	NA	NA	8/8/2005 13:00	8/9/2005 12:30	Sand	1.0
GCSeep-4A	45.5802	-122.75892	NA	NA	8/8/2005 15:30	8/10/2005 13:00	Sand	1.8
GCSeep-4C	45.58032	-122.75885	NA	NA	8/8/2005 15:15	8/10/2005 13:00	Sand & Silt	6.9
GCSeep-4E	45.58045	-122.75863	NA	NA	8/9/2005 11:30	8/10/2005 12:45	Sand & Silt	40.3
GCSeep-7B	45.57943	-122.75665	NA	NA	8/10/2005 12:15	8/11/2005 12:15	Sand	6.3
GCSeep-7F	45.58007	-122.75632	NA	NA	8/11/2005 11:45	8/12/2005 11:45	Silt	47.0
SLSEEP-2A	45.57892	-122.75538	NA	NA	8/10/2005 16:00	8/12/2005 10:00	Sand & Silt	4.9
SLSEEP-2C	45.57908	-122.7552	NA	NA	8/26/2005 17:00	8/30/2005 12:45	Silt	35.3
SLSEEP-2E	45.57928	-122.75503	NA	NA	8/30/2005 14:45	8/31/2005 16:00	Silt	45.5
SLSEEP-3A	45.57872	-122.75485	NA	NA	8/22/2005 15:00	8/23/2005 18:00	Sand	5.0
SLSEEP-4A	45.57845	-122.75427	NA	NA	8/12/2005 11:30	8/16/2005 11:00	Sand & Silt	2.6
SLSEEP-4B	45.57853	-122.75423	NA	NA	8/12/2005 11:45	8/16/2005 11:00	Silt	7.6

Notes:

cm/d = centimeters/day

Stdev = standard deviation

n/a – not applicable

NA = Not available

Geographical coordinates are provided in latitude and longitude North American Datum 1983

a - The buoy type meter at monitoring station GS-PC1 contained two meters. The GS-PC1A meter did not record data due to sediment de-gassing interferences.

Table 4.2
Summary of Groundwater Discharge Statistics

Monitoring Station	Substrate	Specific Discharge (cm/d)			
		Mean	Min	Max	Stdev
NW Natural					
GS-B2	Silty Clay	0.05	-0.3	0.57	0.16
GS-B7	Silty Clay	-0.05	-0.57	0.44	0.2
GS-C5	Silty Sand	0.69	-0.65	2.57	0.82
GS-C7	Sandy Silt	1.38	-0.88	3	0.8
GS-D5	Sandy Silt	1.47	-0.38	4.59	0.99
GS-PC1B	Silt	1	-2.16	10.1	3.04
LWG GASCO Data					
GCSeep-2A	Silt	0.24	-2.44	2.44	1.04
GCSeep-3A	Sand	3.67	0.62	5.99	1.02
GCSeep-4A	Sand	-0.07	-1.2	2.15	0.55
GCSeep-4C	Sand and Silt	-2.13	-4.67	1.45	1.58
GCSeep-4E	Sand and Silt	1	-0.22	4.4	0.89
GCSeep-7B	Sand	5.67	1.16	8.72	1.8
GCSeep-7F	Silt	0.33	-1.23	3.12	0.81
LWG Siltronic Data					
SLSeep-2A	Sand and Silt	0.15	-28.48	18.52	7.26
SLSeep-2C	Silt	5.04	3.51	6.61	0.51
SLSeep-2E	Silt	3.48	-0.04	9.2	2.88
SLSeep-3A	Sand	0.29	-4.96	2.15	1.29
SLSeep-4A	Sand and Silt	10.49	2.52	29.84	5.27
SLSeep-4B	Silt	-1.68	-4.59	0.79	1.05

Notes:

cm/d = centimeters/day

Stdev = standard deviation

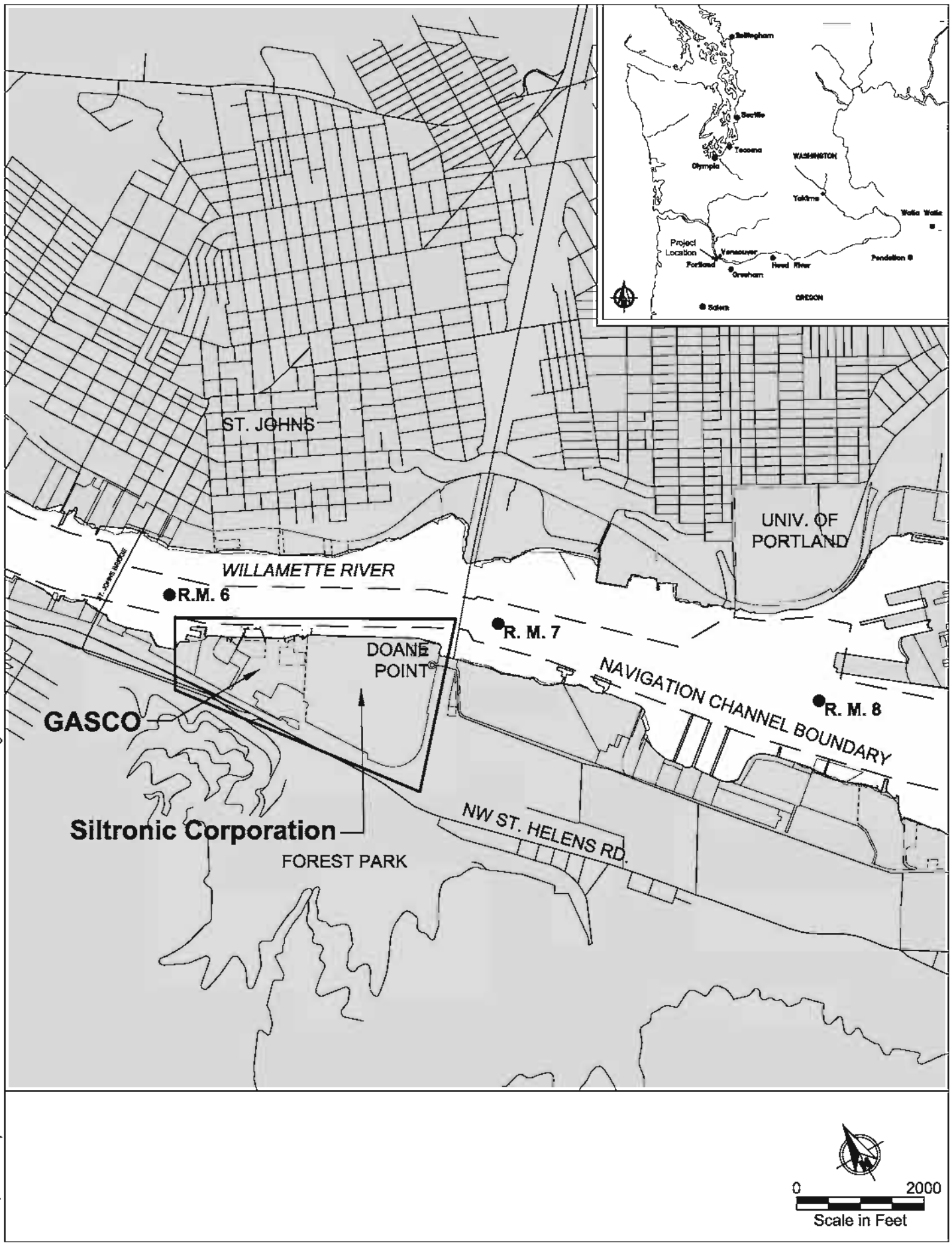
Table 4.3
Seepage Discharge Calculations

Sector	Seepage Monitoring Locations	Mean Specific Discharge Calculated point reading from seepage meter (cm/day)	Mean Specific Discharge Interpolated using linear kriging (cm/day)	Mean Specific Discharge Interpolated using exponential (cm/day)	Avg discharge of quadrant Interpolated using linear kriging (GPM)	Avg discharge of quadrant Interpolated using exponential kriging (GPM)
A1			-0.06	0.10	-0.45	0.74
A2	GCSEEP-2A	0.24	0.81	0.81	6.33	6.28
	GS-B2SM	0.05				
A3	GCSEEP-3A	3.67	2.25	2.25	17.54	17.48
A4	GCSEEP-4A	-0.07	-0.68	-0.68	-5.33	-5.30
	GCSEEP-4C	-2.13				
A5	GS-PC1SM	1.03	1.35	1.31	10.48	10.22
A6			3.33	3.14	25.91	24.40
A7	GCSEEP-7B	5.67	5.25	5.22	40.86	40.62
A8	GS-B7SM	-0.05	1.43	1.40	11.11	10.90
A9	SLSEEP-2A	0.15	1.19	1.19	9.25	9.26
	SLSEEP-2C	5.04				
	SLSEEP3A	0.29				
A10	SLSEEP-4A	10.49	2.54	2.56	19.78	19.93
	SLSEEP-4B	-1.68				
B1			-0.34	-0.06	-2.63	-0.44
B2			0.22	0.36	1.68	2.81
B3			0.64	0.76	4.95	5.91
B4	GCSEEP-4E	1.00	0.65	0.73	5.03	5.70
B5			0.93	0.98	7.22	7.61
B6	GS-C5SM	0.69	1.34	1.30	10.39	10.13
B7	GCSEEP-7F	0.33	1.09	1.10	8.49	8.55
B8	GS-C7SM	1.38	1.76	1.76	13.72	13.69
B9	SLSEEP-2E	3.48	2.12	2.25	16.52	17.49
B10			-0.34	0.08	-2.68	0.59
C1			-0.52	-0.09	-4.02	-0.70
C2			-0.23	0.11	-1.77	0.89
C3			0.04	0.33	0.34	2.57
C4			0.20	0.45	1.59	3.52
C5			0.29	0.49	2.23	3.82
C6			0.22	0.38	1.75	2.97
C7			0.37	0.50	2.86	3.92
C8			1.25	1.29	9.70	10.02
C9	GS-D5SM	1.47	1.26	1.42	9.77	11.06
C10			0.56	1.01	4.39	7.89
		Total discharge of study area (all 30 sectors) in GPM			**225.02**	**252.54**

Notes:

Area of sector based on 45,760 square feet (42,512,431 square centimeters). Discharge of quadrant = discharge * area, converted to gallons per minute using 1.83×10^{-7} conversion factor.

FIGURES



Jan 31, 2008 3:43pm cdavidson K:\Jobs\000029-GASCO\00002902\00002902-118.dwg FIG 1.1

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.1
Vicinity Map
NW Natural Gasco Site
Portland, Oregon

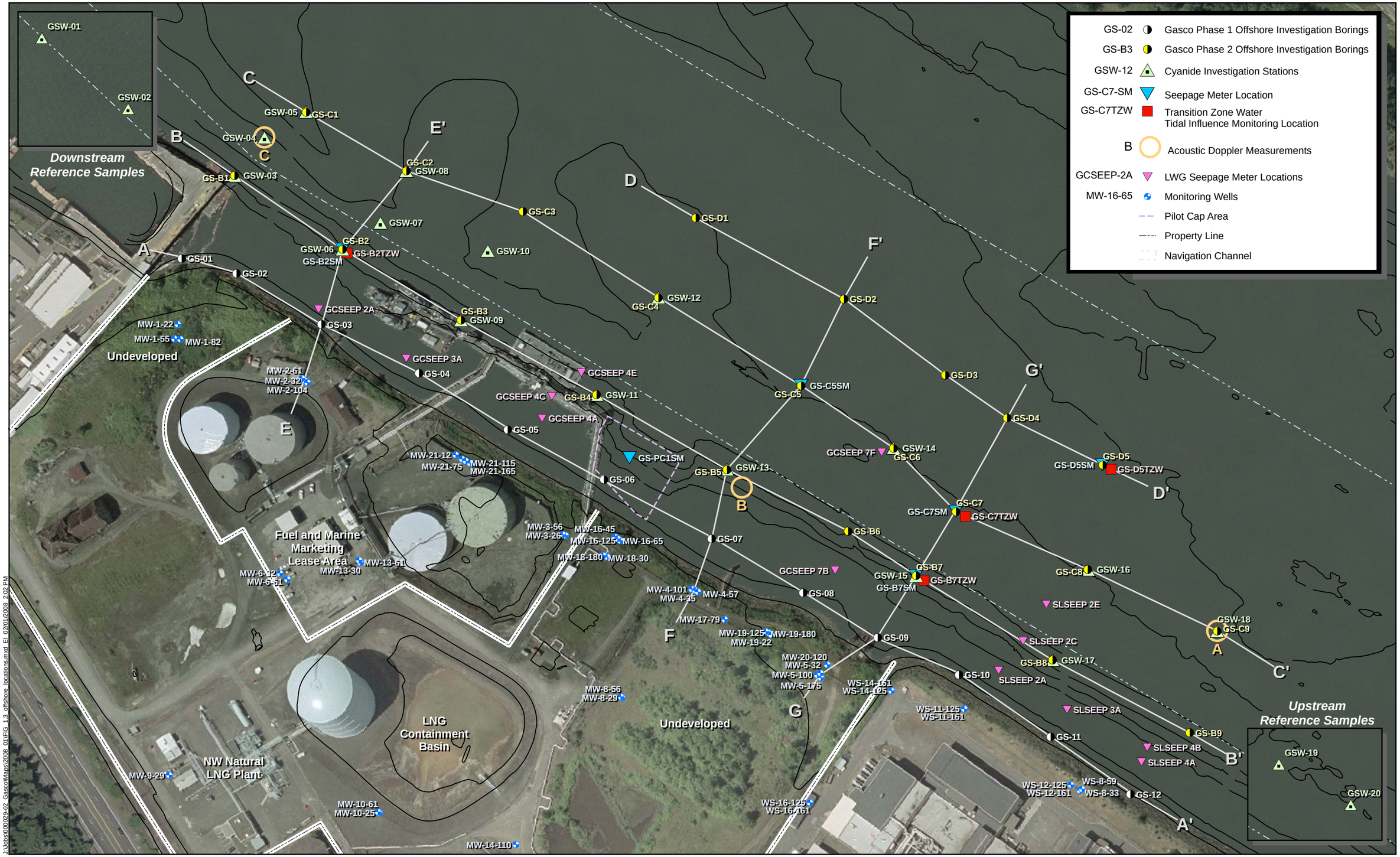
J:\Jobs\000029-02_Gasco\Maps\2008_01\FIG_1.2_location_map.mxd EI 02/01/2008 2:24 PM

ANCHOR ENVIRONMENTAL, L.L.C.

0 200
Scale in Feet
1 inch equals 200 feet

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 1.2
Location Map
NW Natural - Gasco Site
Portland, Oregon

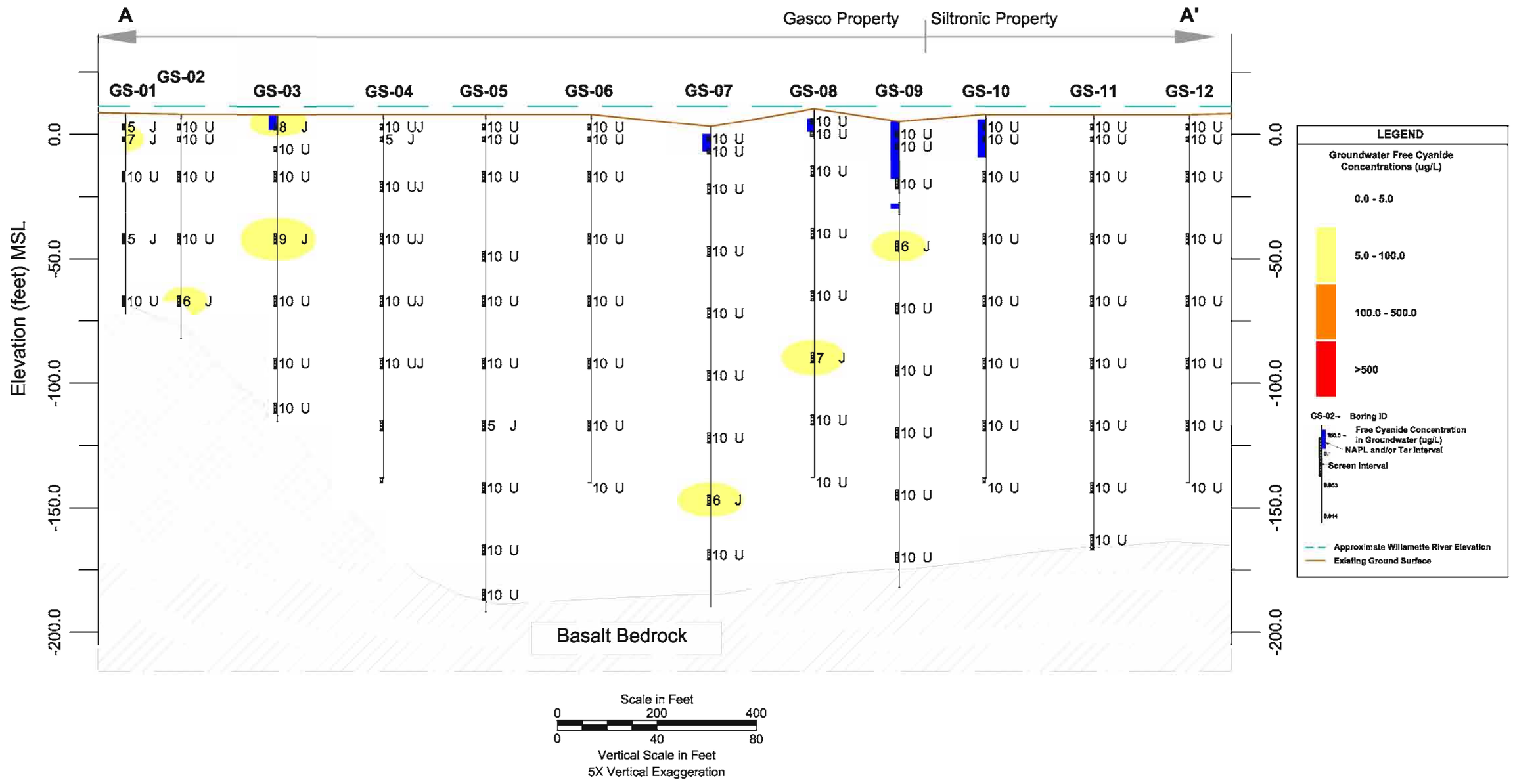


ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 1.3
Offshore Sampling Locations
NW Natural - Gasco Site
Portland, Oregon



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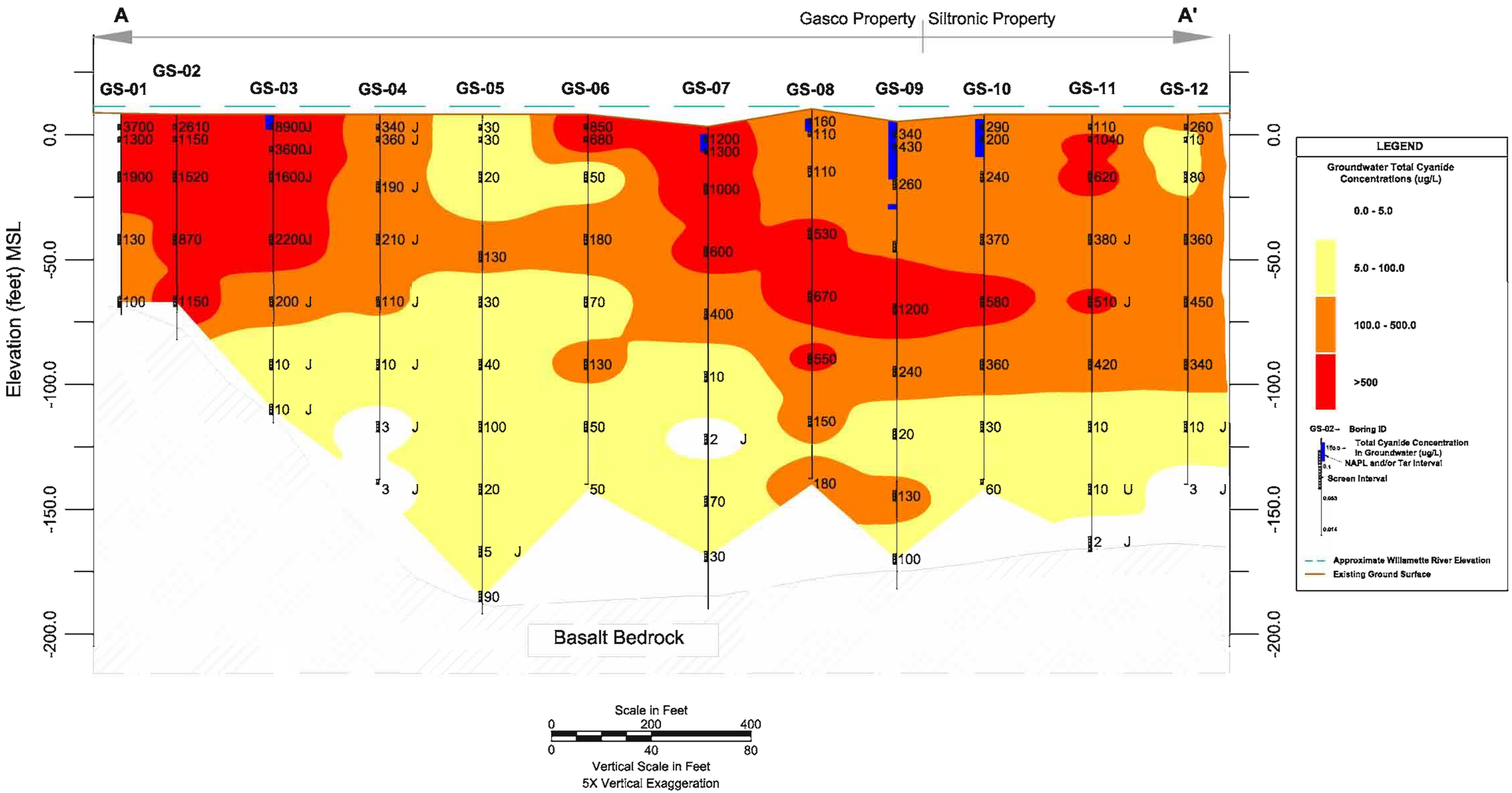
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.4a
Subsurface Profile A-A'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



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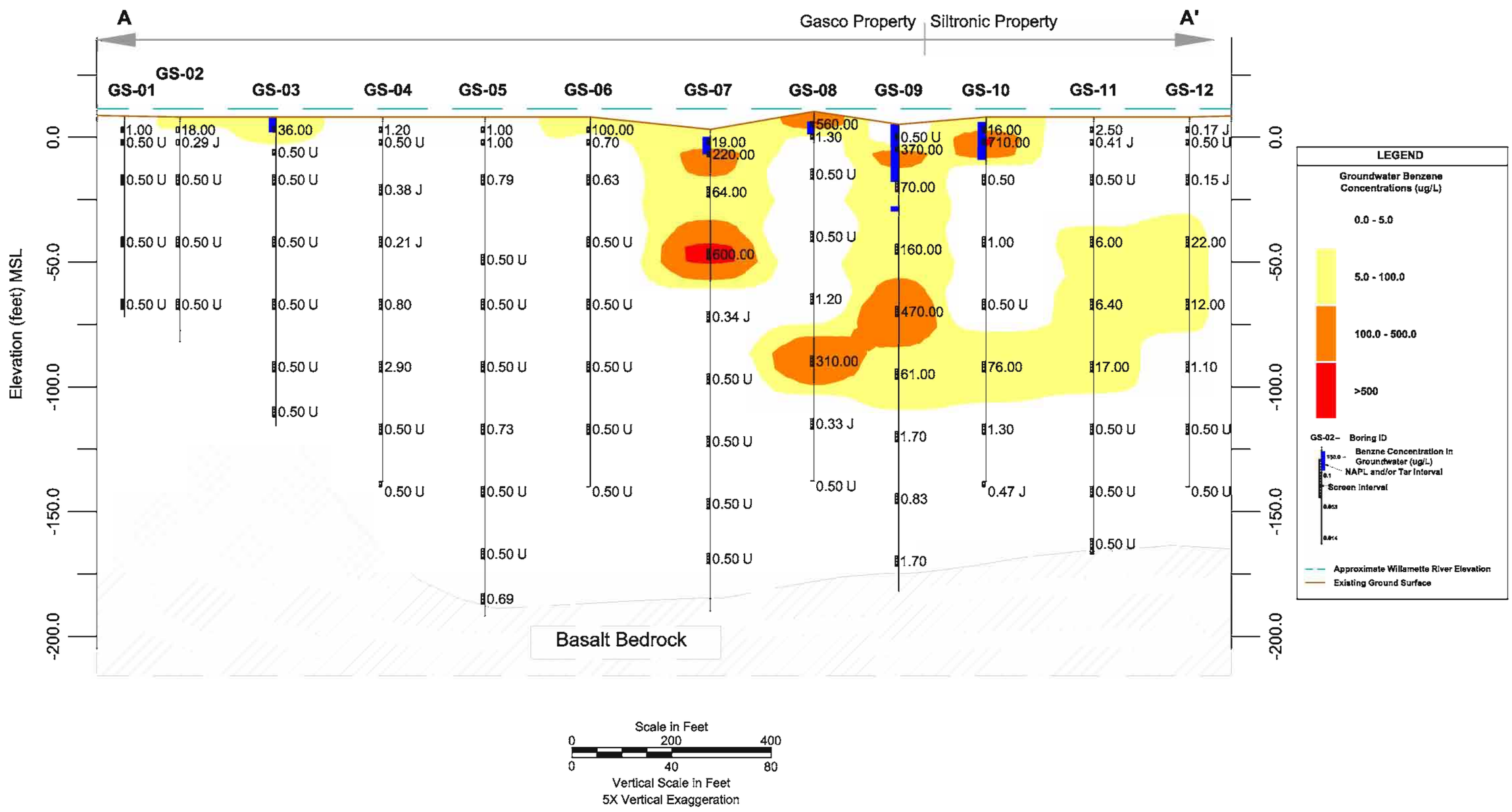
ANCHOR ENVIRONMENTAL, L.L.C.

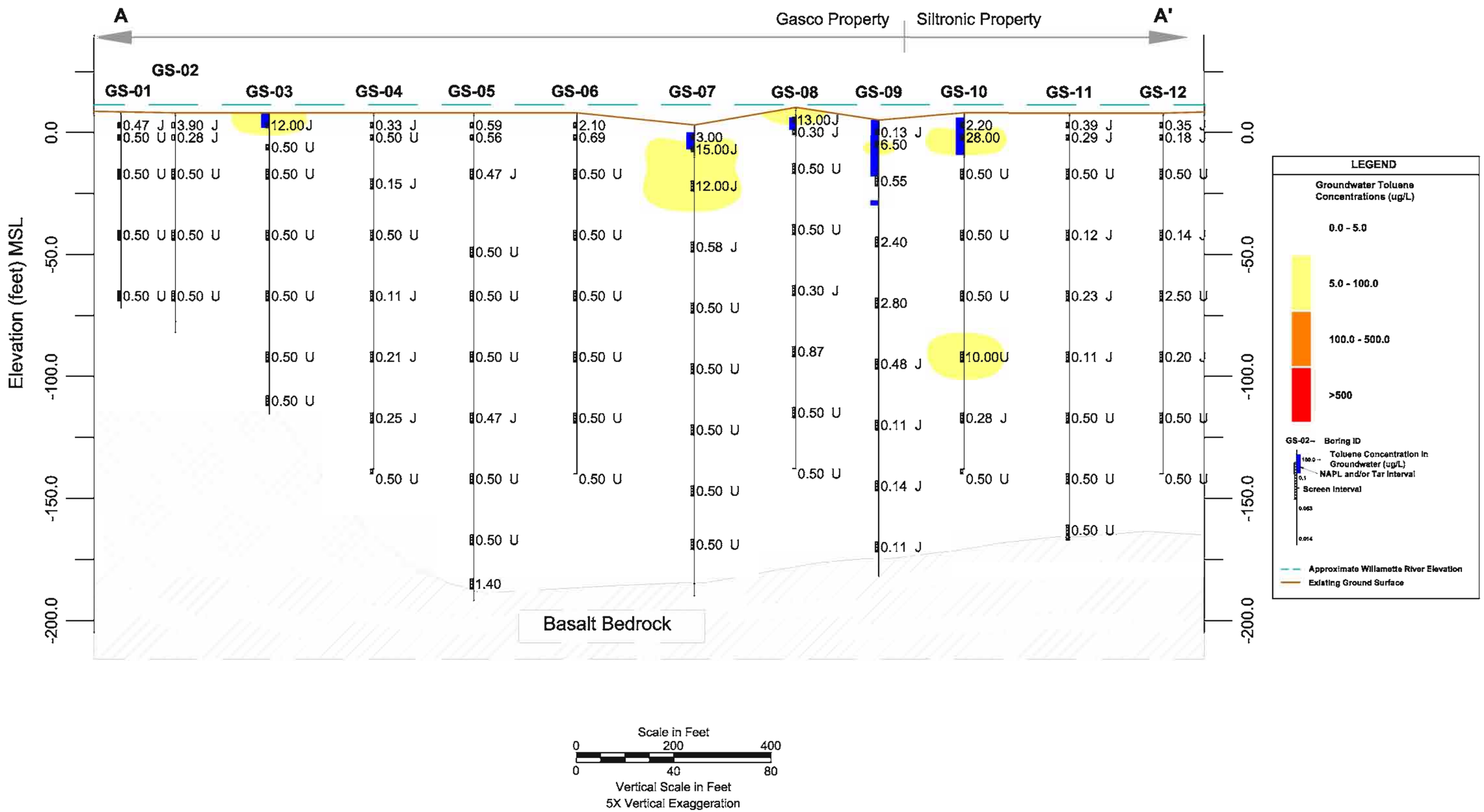
Figure 1.4b
Subsurface Profile A-A'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:52pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg A

ANCHOR ENVIRONMENTAL, L.L.C.

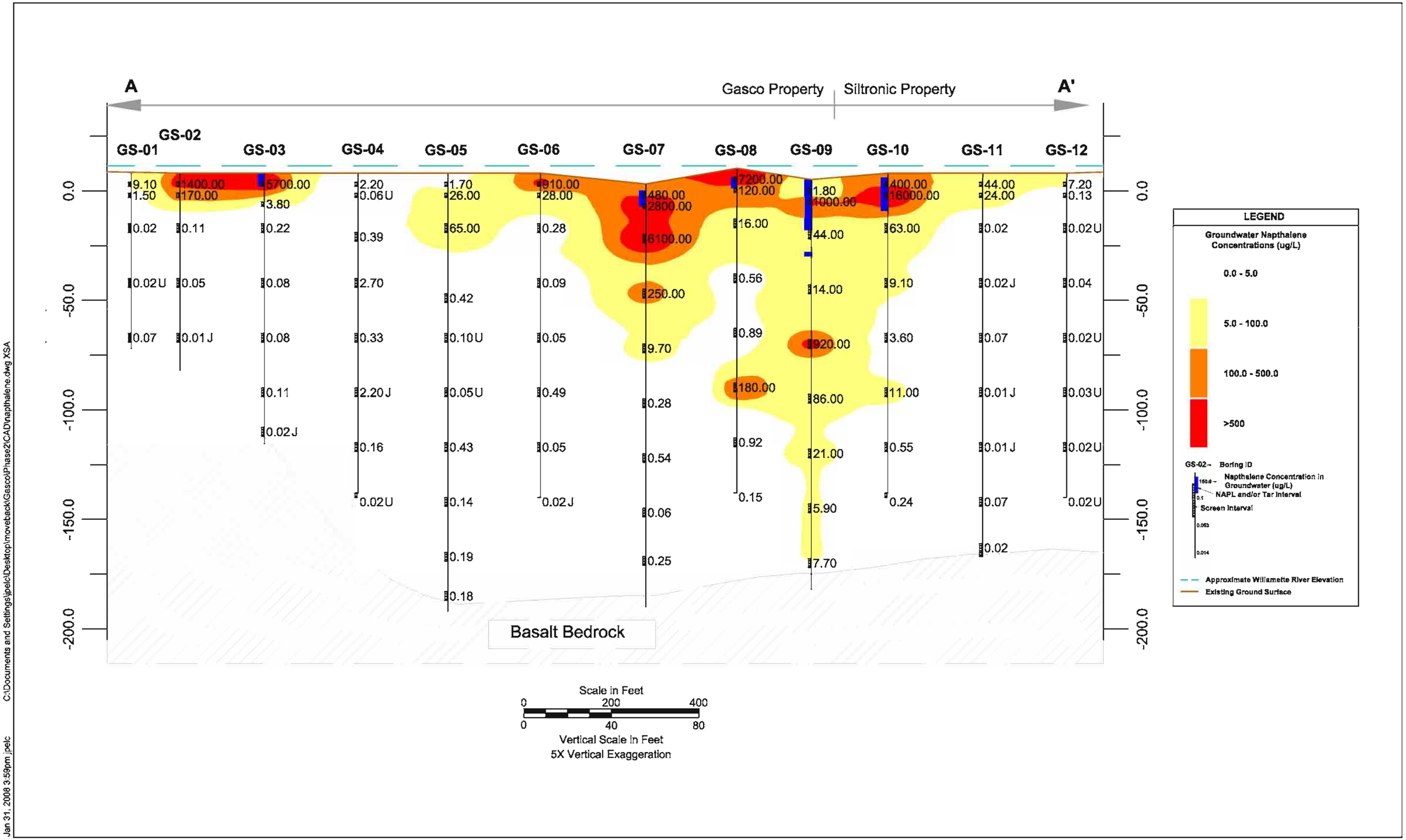
Figure 1.4c
Subsurface Profile A-A'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:55pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSA

ANCHOR ENVIRONMENTAL, L.L.C.

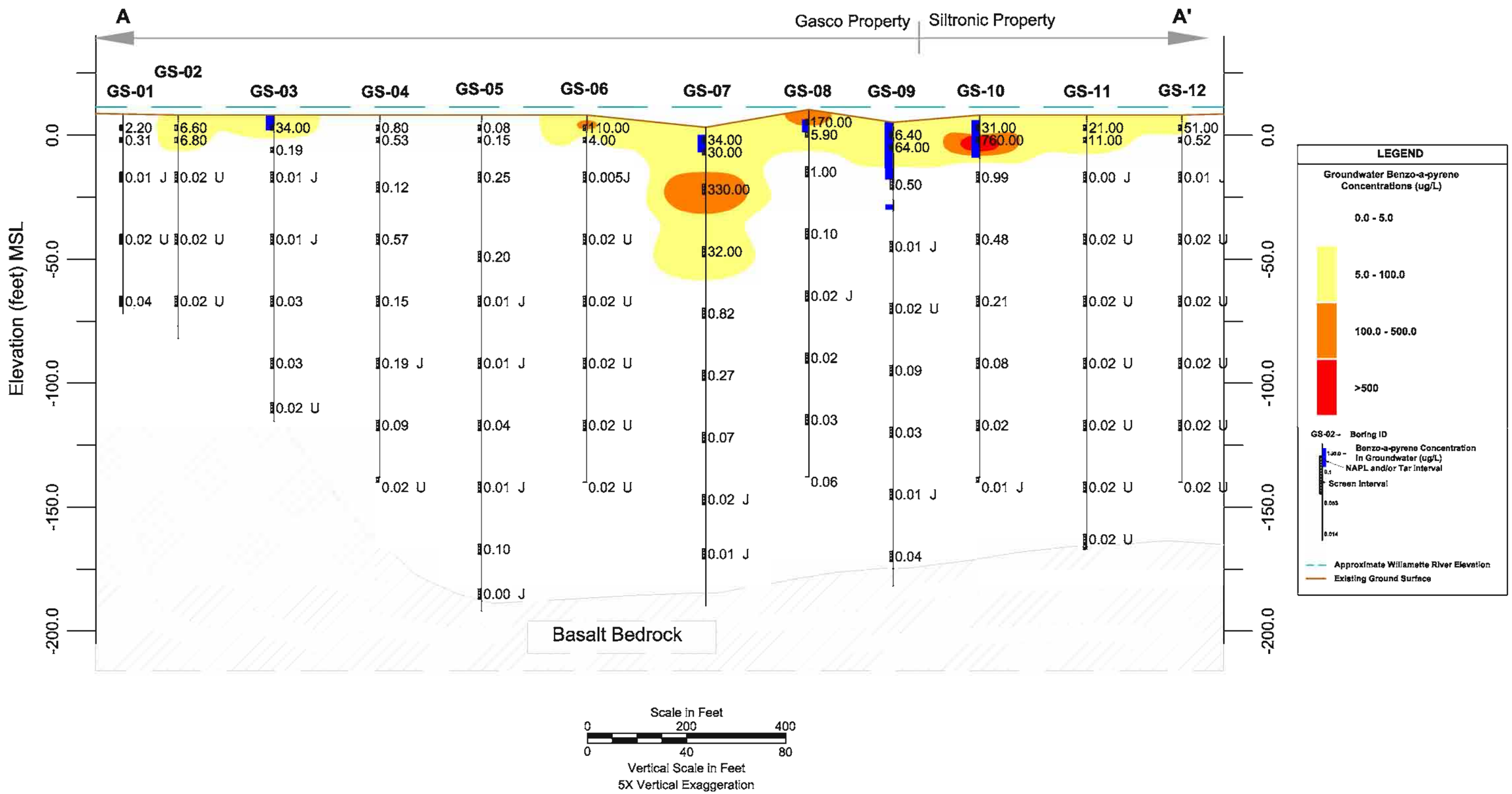
Figure 1.4d
Subsurface Profile A-A'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:59pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XSA

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.4e
Subsurface Profile A-A'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



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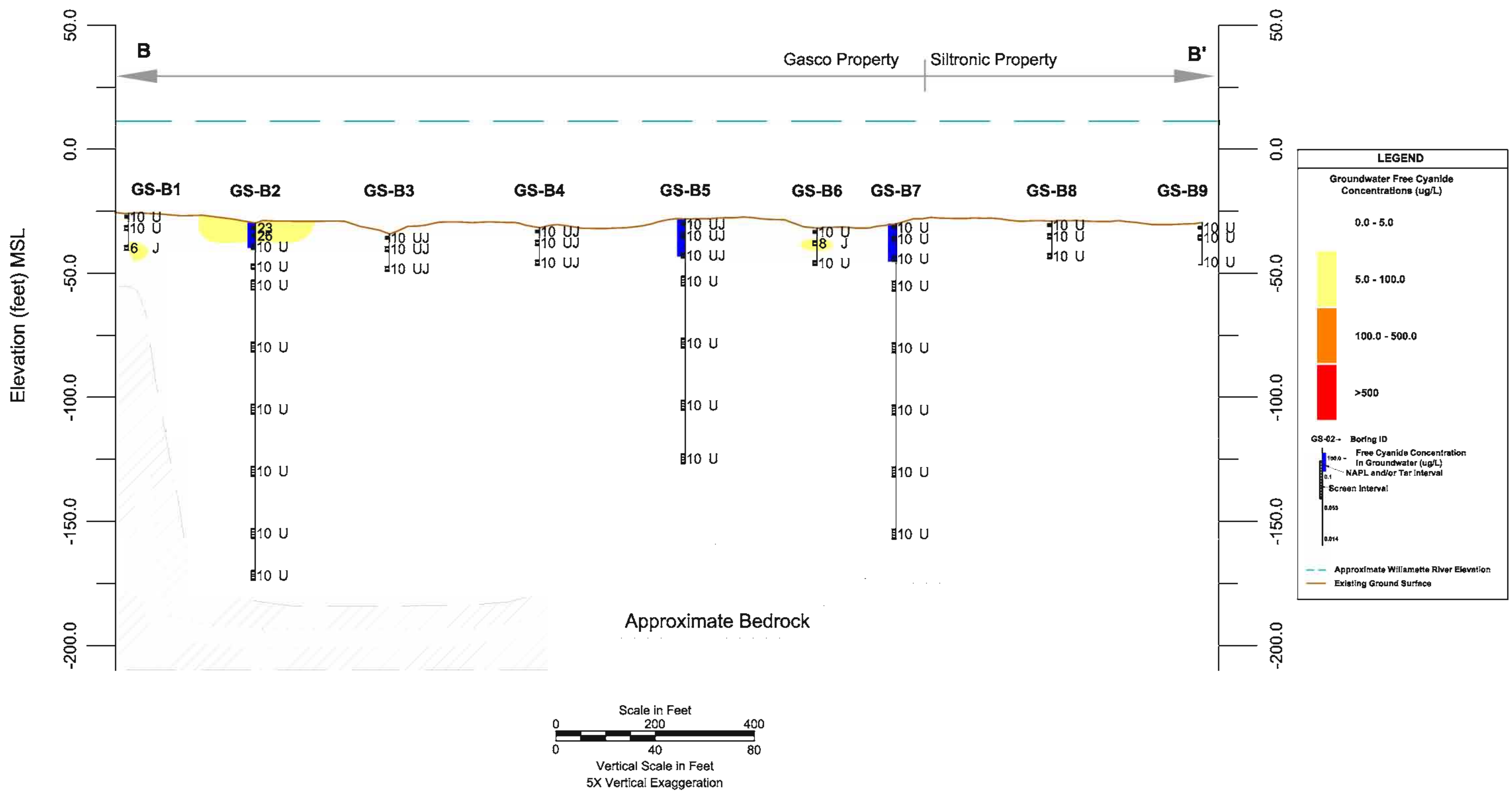
ANCHOR ENVIRONMENTAL, L.L.C.

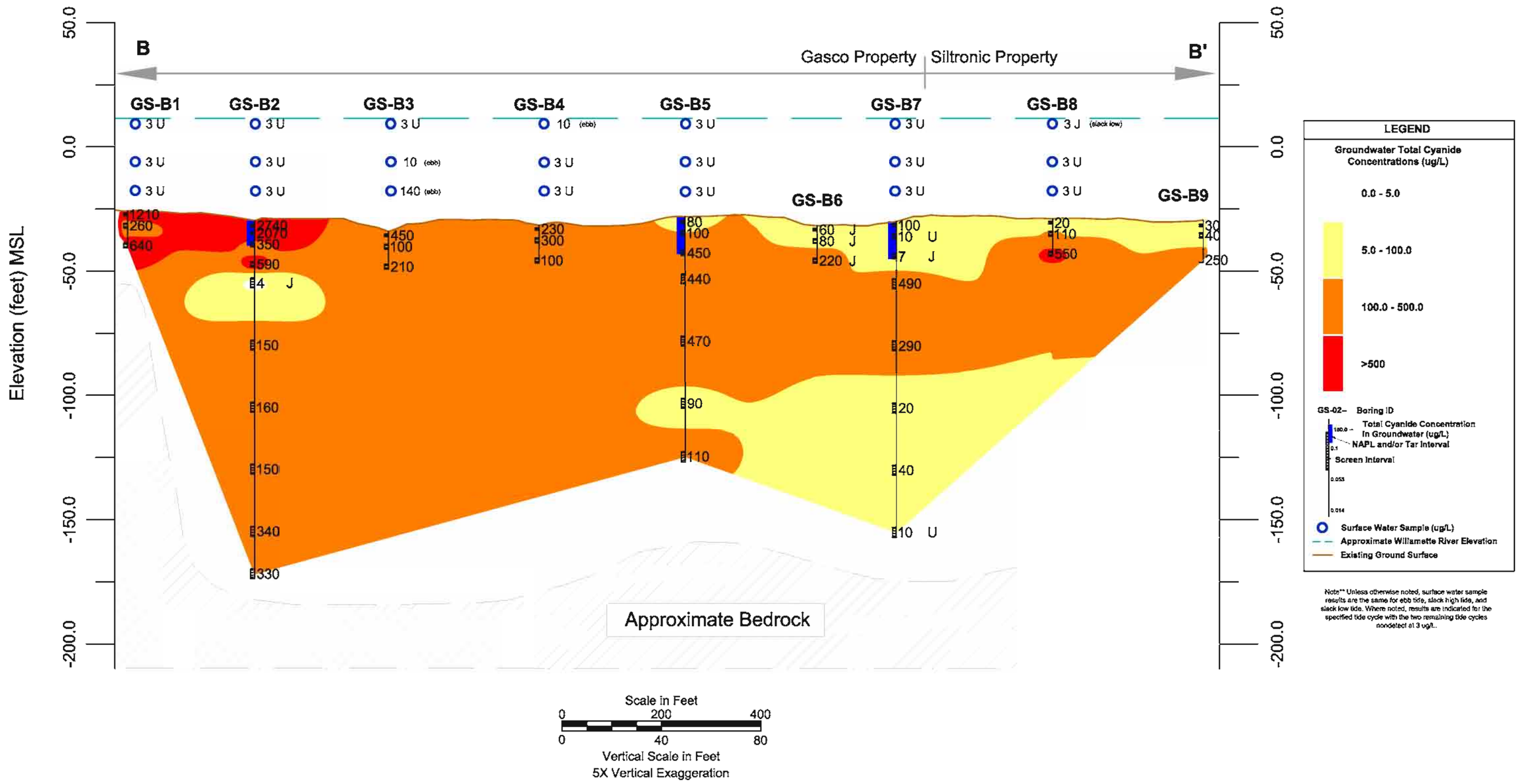
Figure 1.4f
Subsurface Profile A-A'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 24, 2008 2:47pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg XSB

ANCHOR ENVIRONMENTAL, L.L.C.

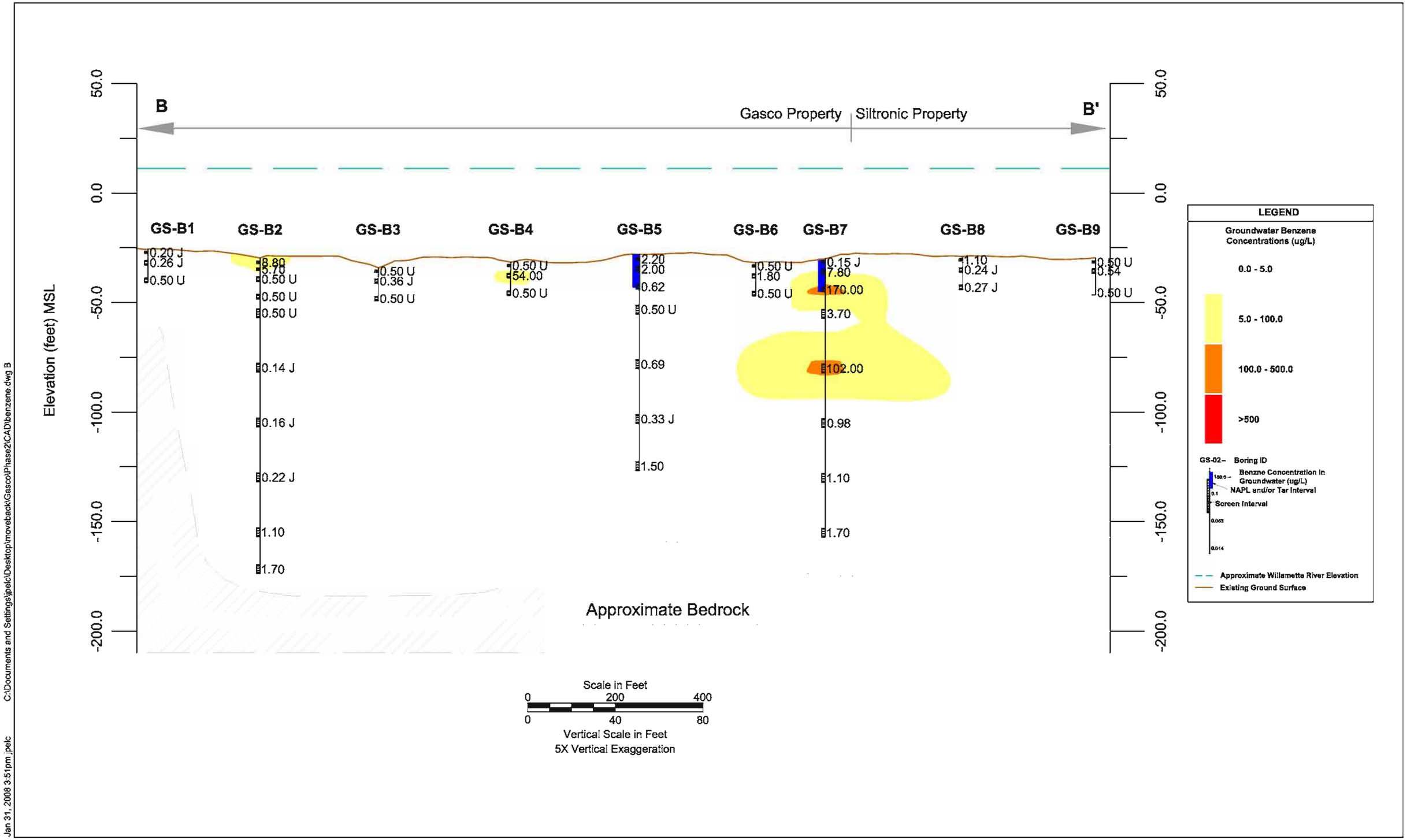
Figure 1.5a
Subsurface Profile B-B'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:47pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XSB

ANCHOR ENVIRONMENTAL, L.L.C.

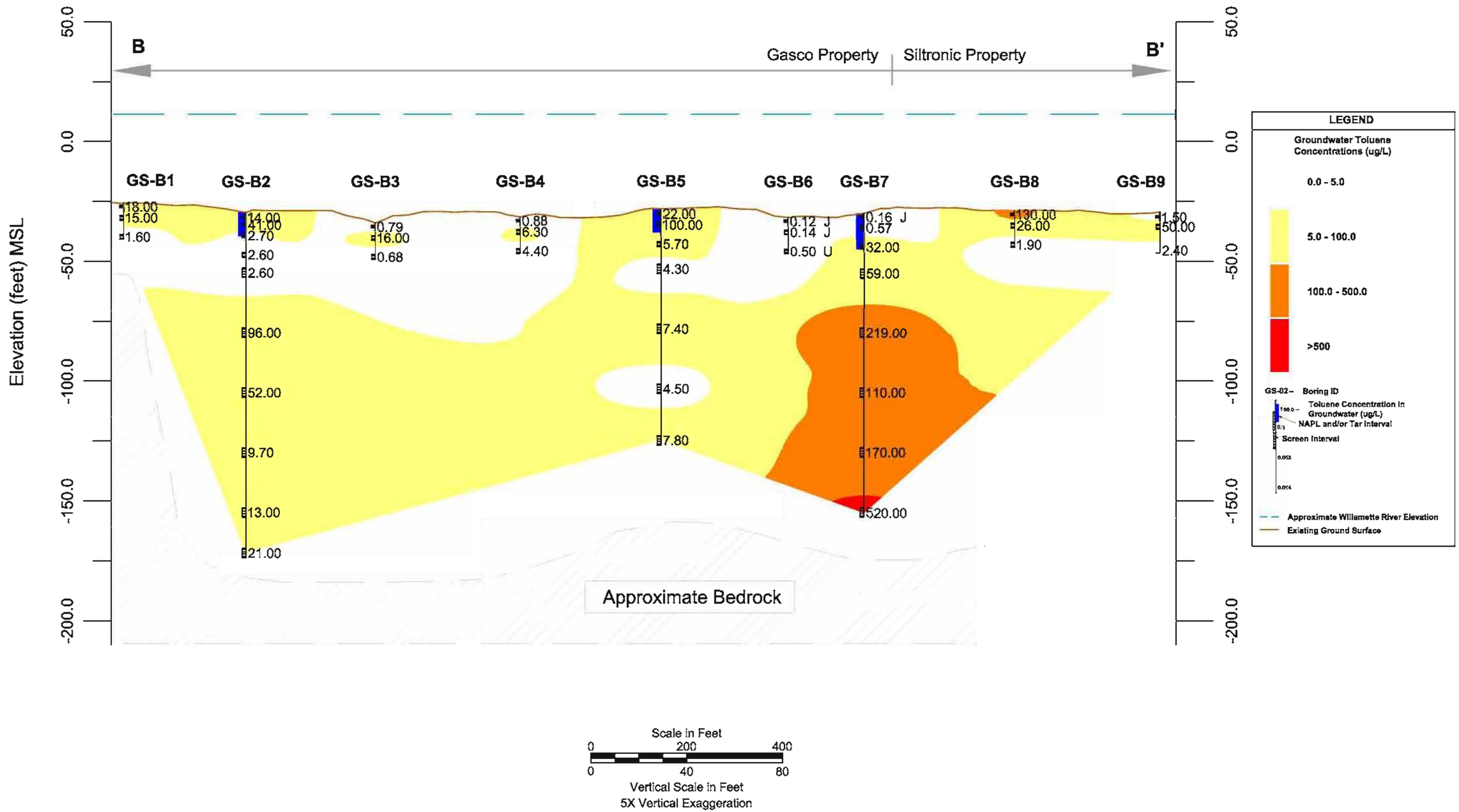
Figure 1.5b
Subsurface Profile B-B'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:51pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg B

ANCHOR ENVIRONMENTAL, L.L.C.

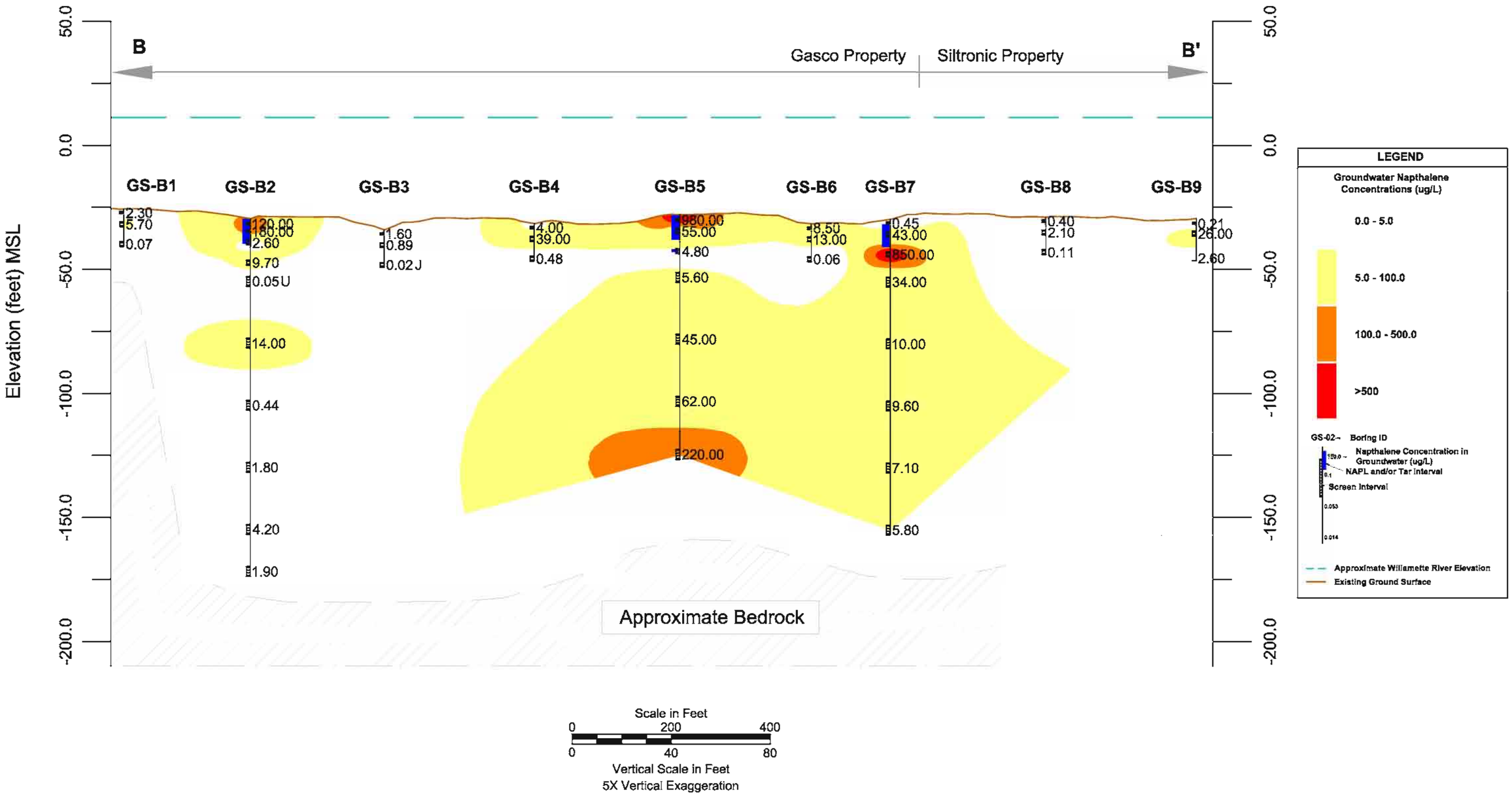
Figure 1.5c
Subsurface Profile B-B'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:55pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSB

ANCHOR ENVIRONMENTAL, L.L.C.

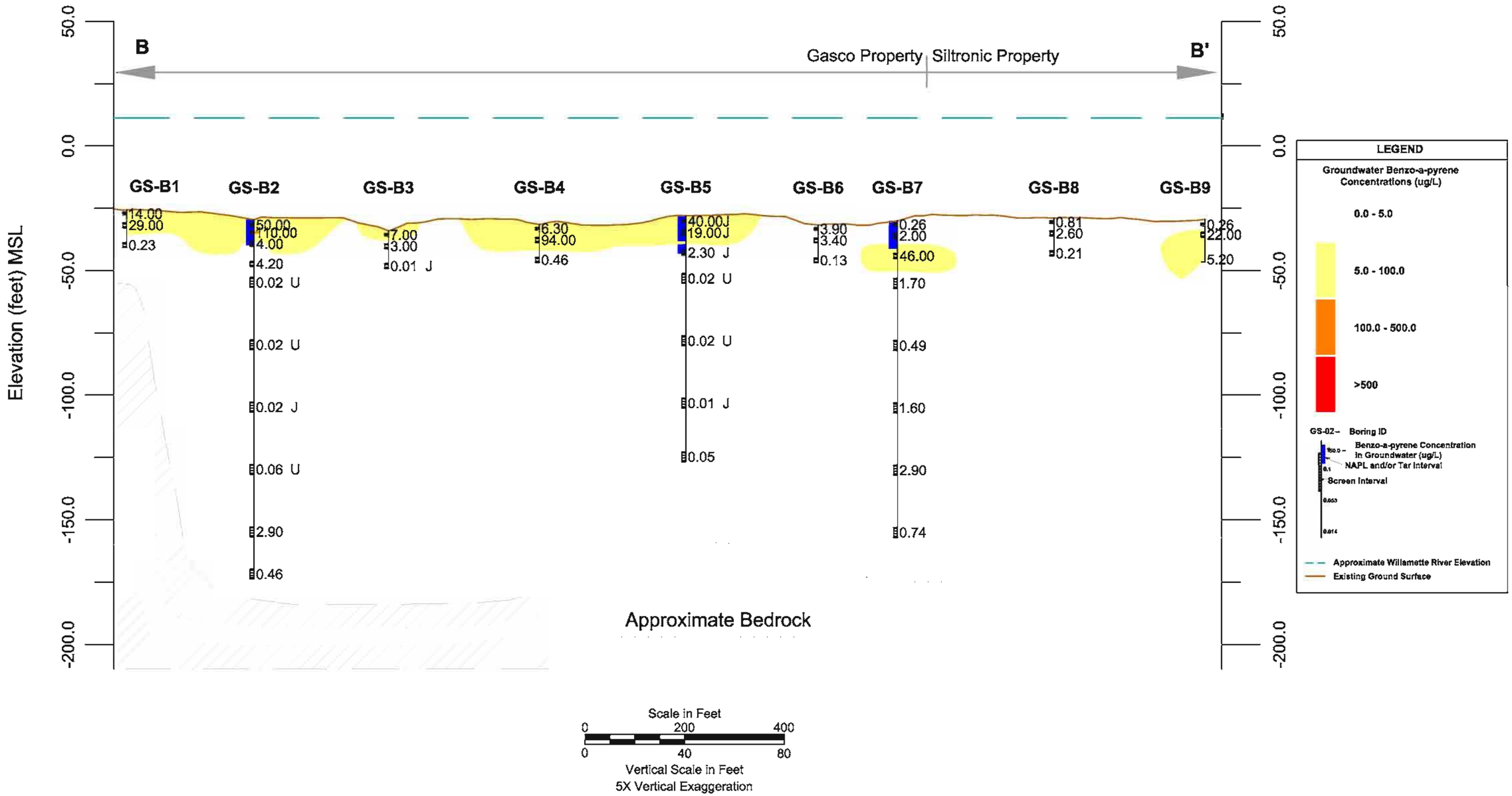
Figure 1.5d
Subsurface Profile B-B'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:58pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XSB

ANCHOR ENVIRONMENTAL, L.L.C.

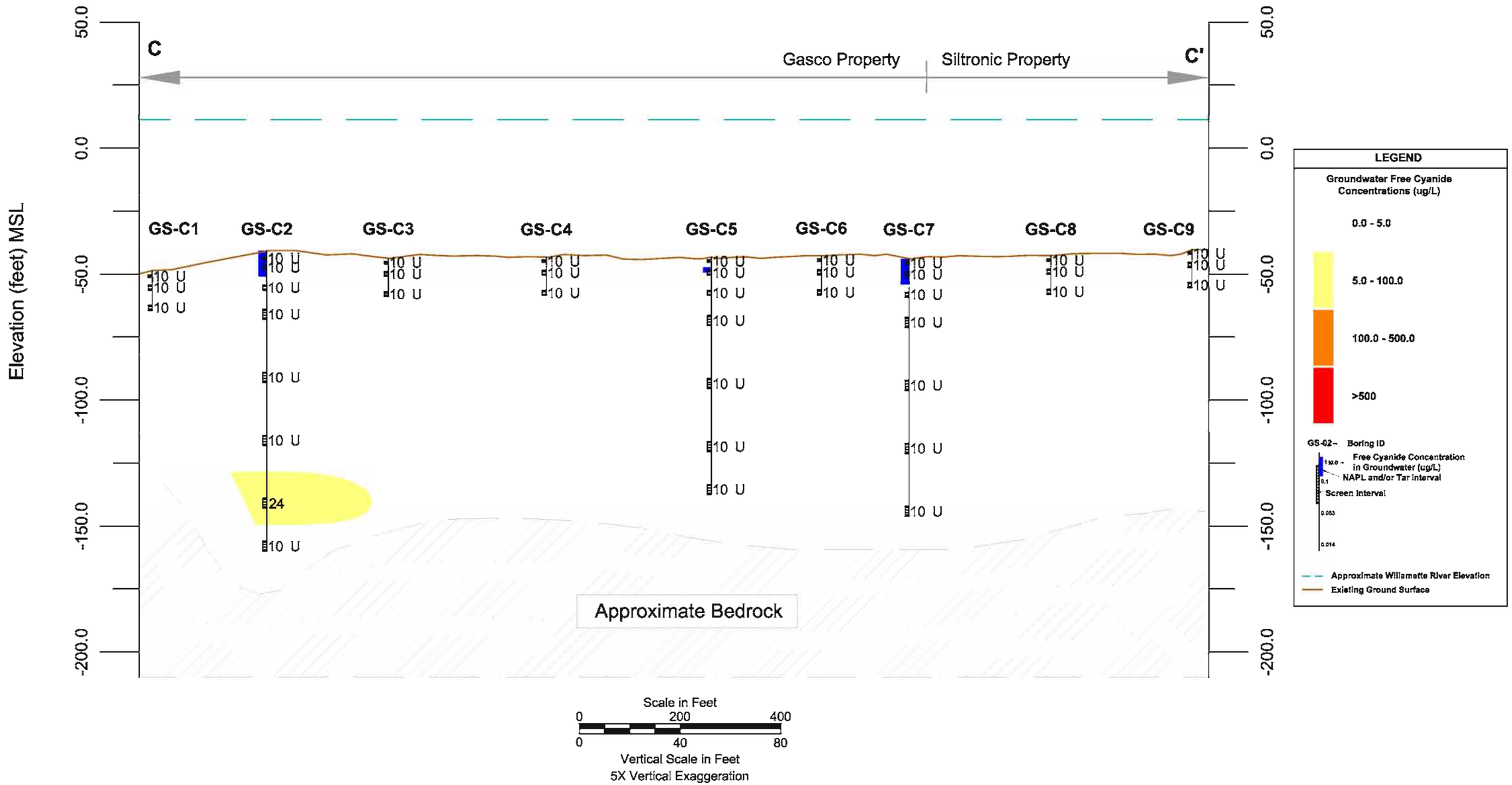
Figure 1.5e
Subsurface Profile B-B'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 24, 2008 2:58pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XSB

ANCHOR ENVIRONMENTAL, L.L.C.

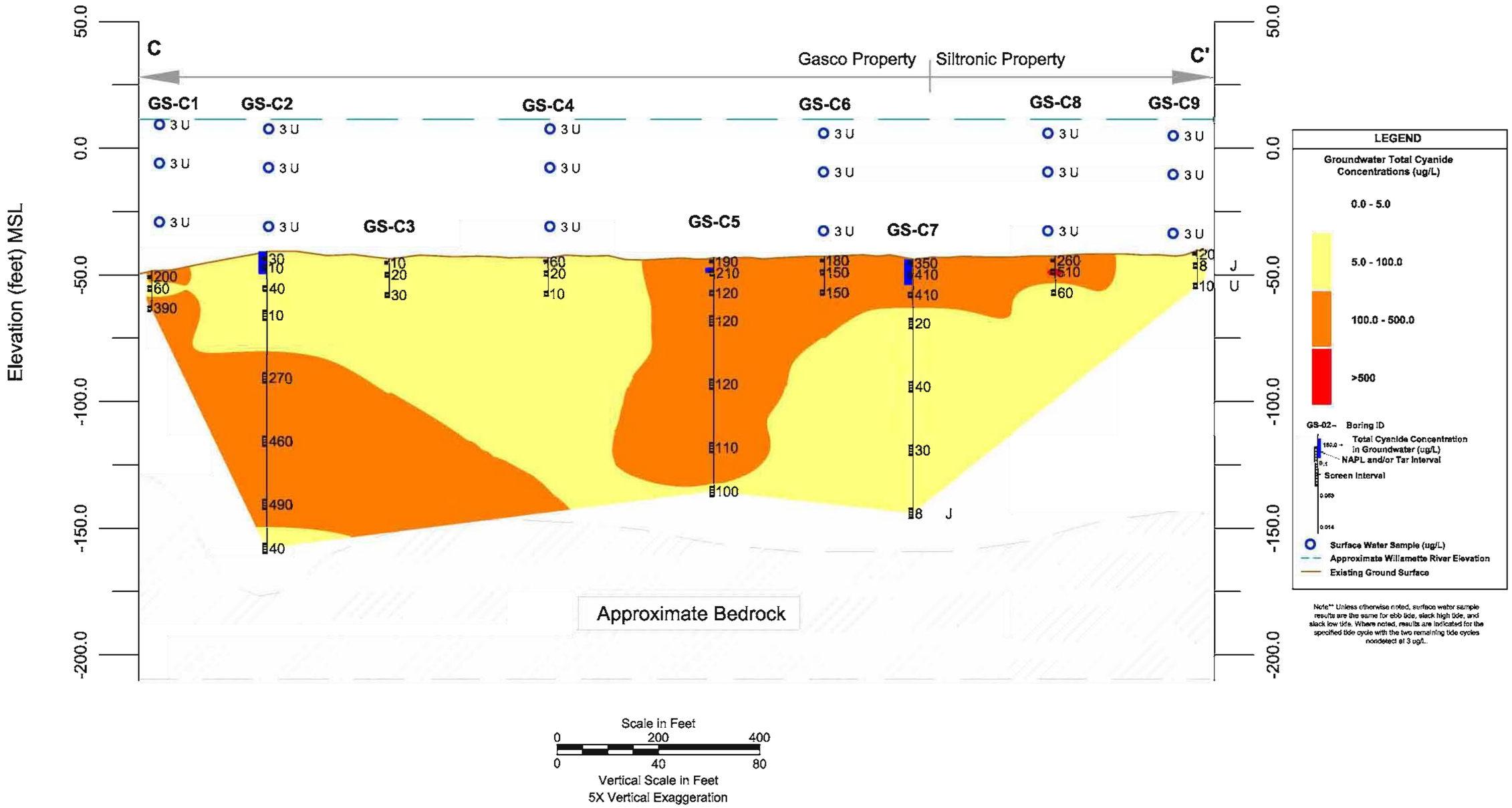
Figure 1.5f
Subsurface Profile B-B'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 24, 2008 2:49pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg XSC

ANCHOR ENVIRONMENTAL, L.L.C.

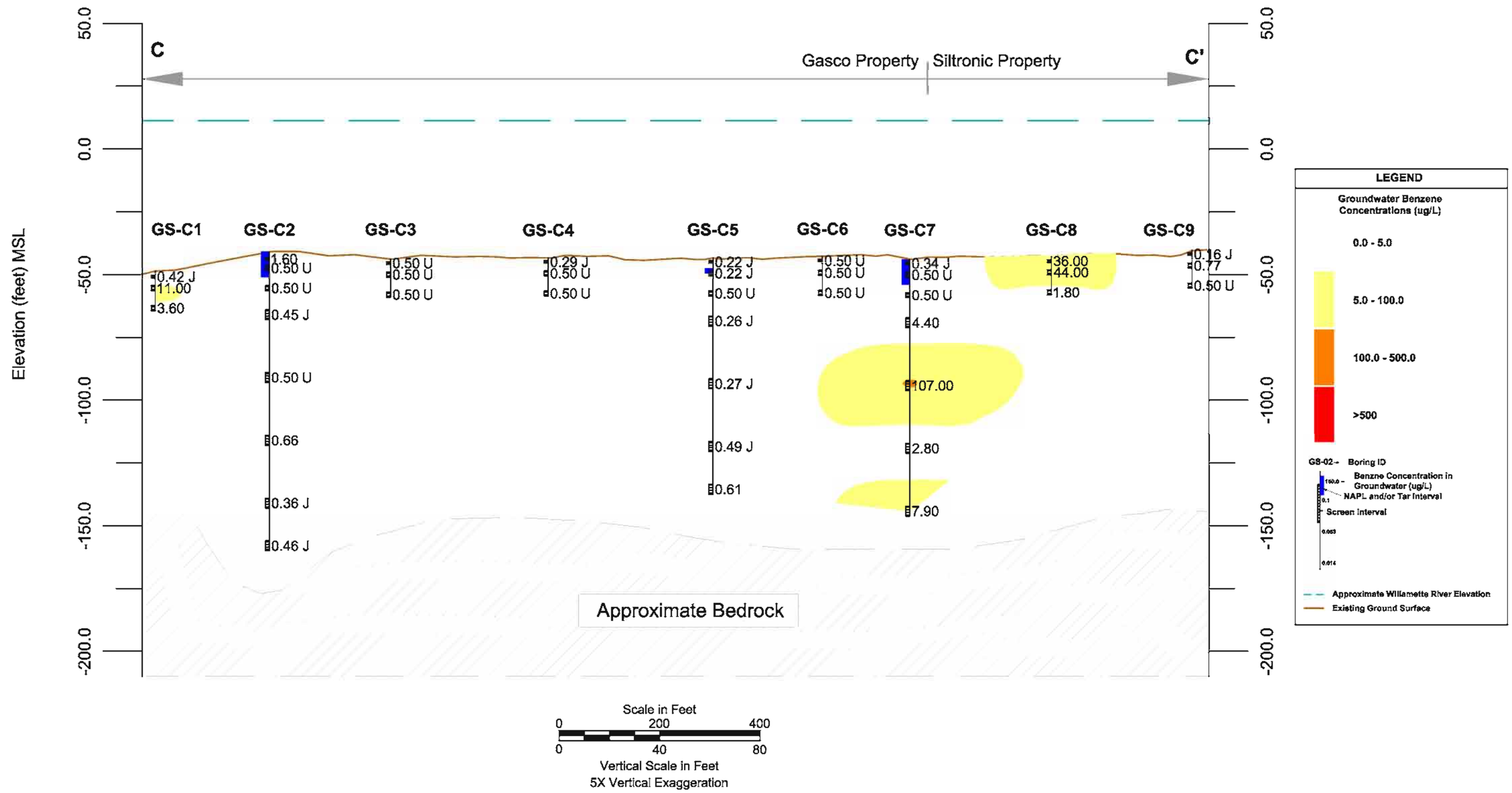
Figure 1.6a
Subsurface Profile C-C'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:47pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XSC

ANCHOR ENVIRONMENTAL, L.L.C.

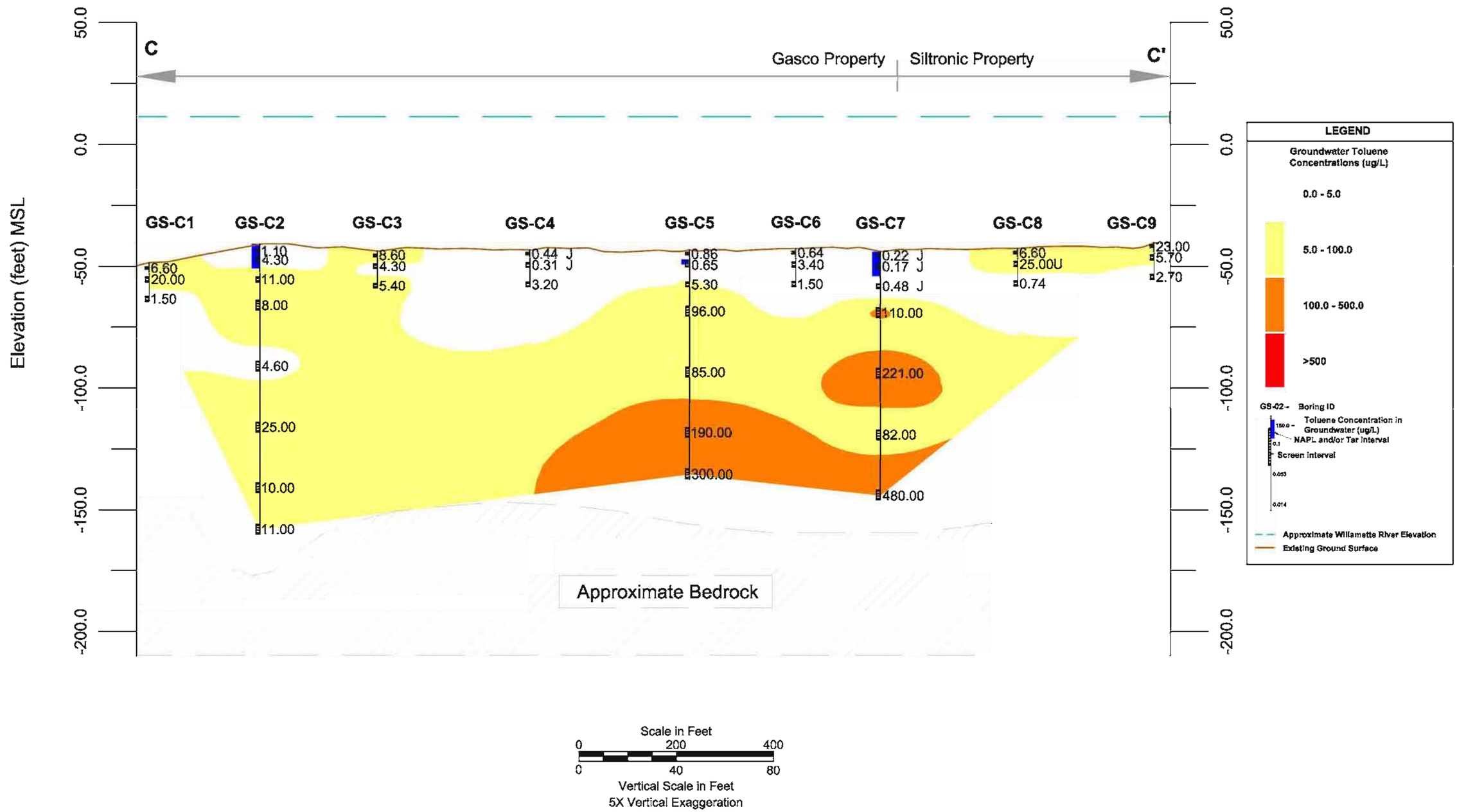
Figure 1.6b
Subsurface Profile C-C'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:51pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg C

ANCHOR ENVIRONMENTAL, L.L.C.

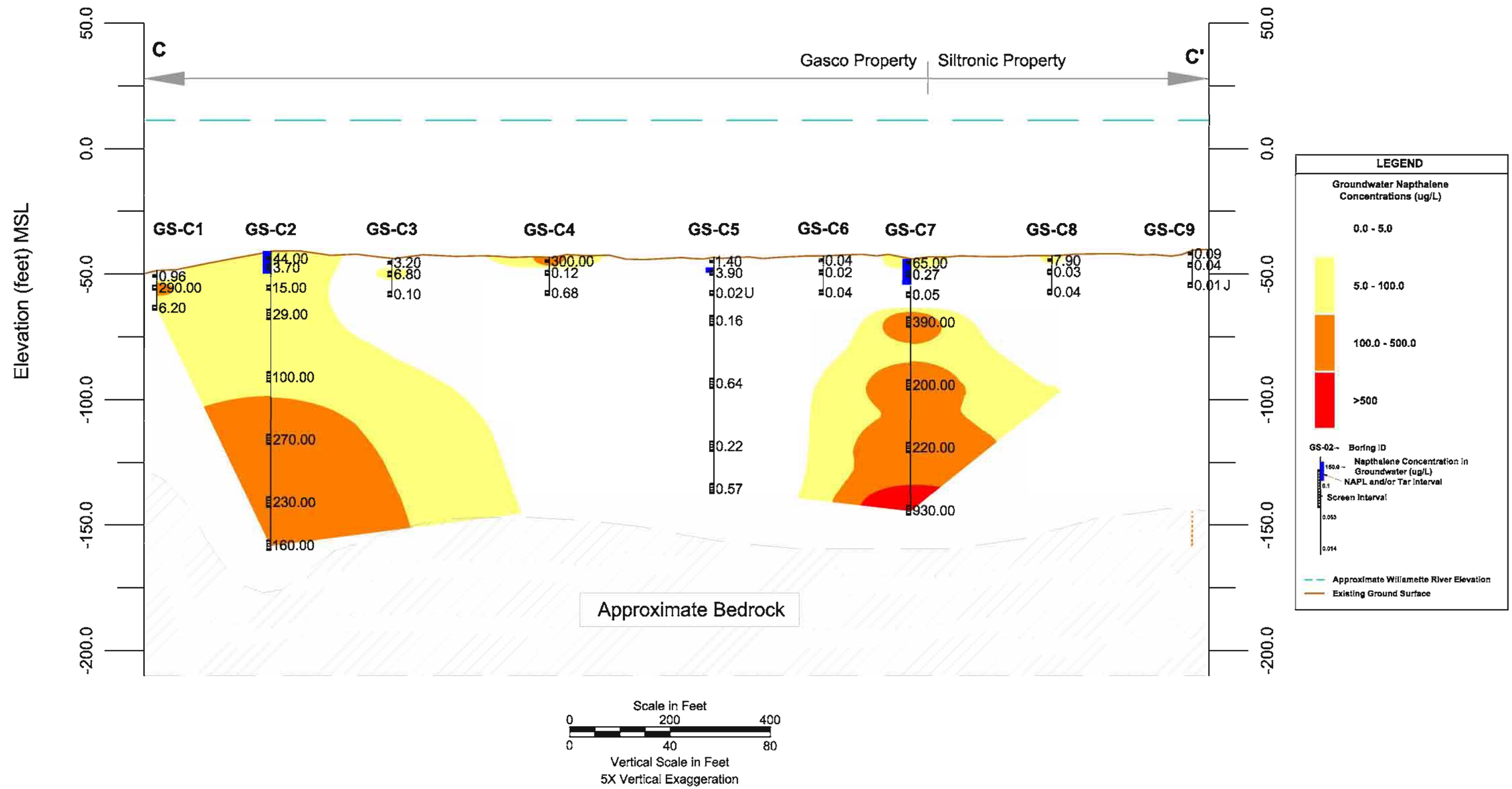
Figure 1.6c
Subsurface Profile C-C'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:54pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSC

ANCHOR ENVIRONMENTAL, L.L.C.

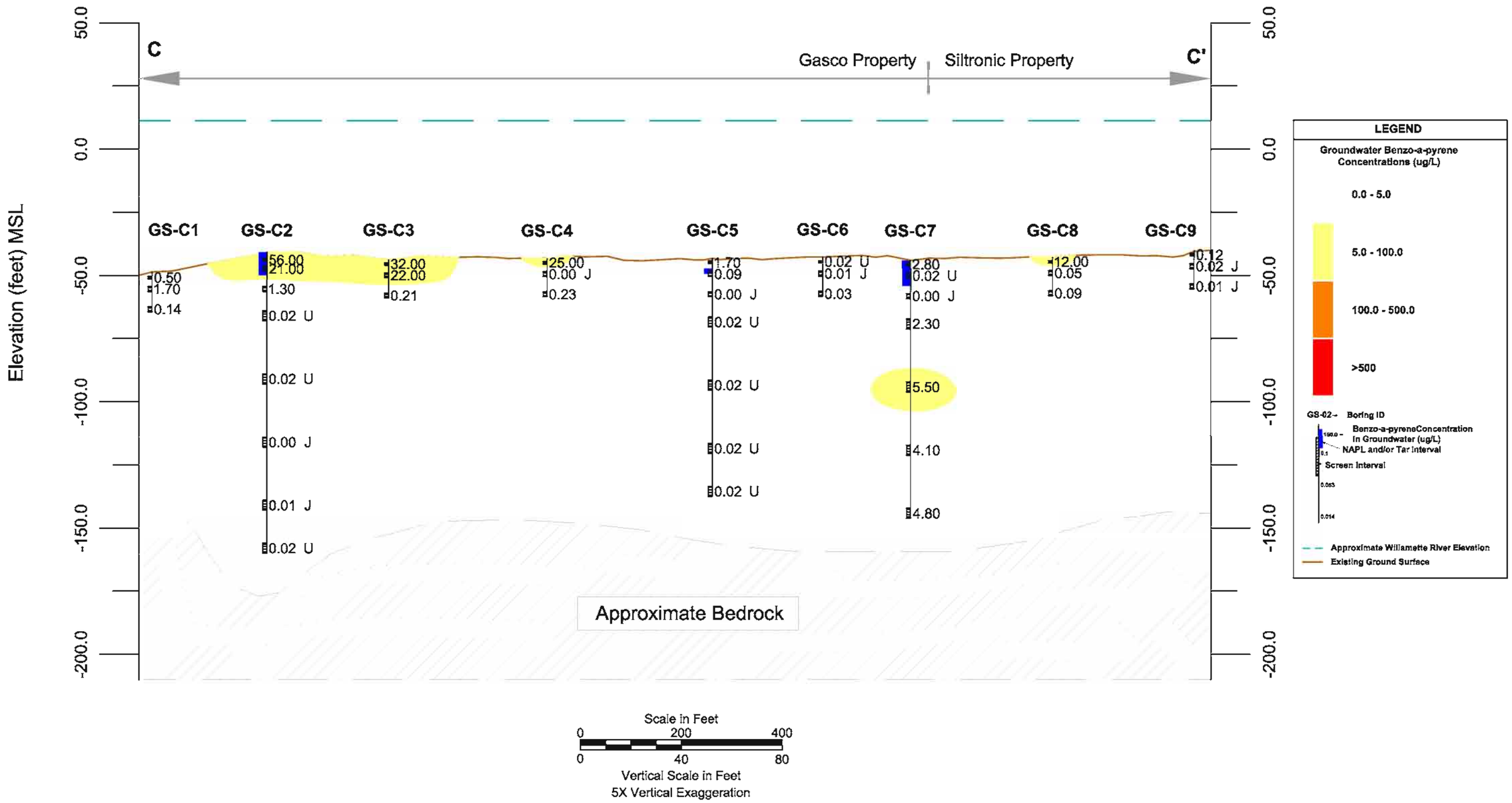
Figure 1.6d
Subsurface Profile C-C'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:58pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CA\Dnapthalene.dwg XSC

ANCHOR ENVIRONMENTAL, L.L.C.

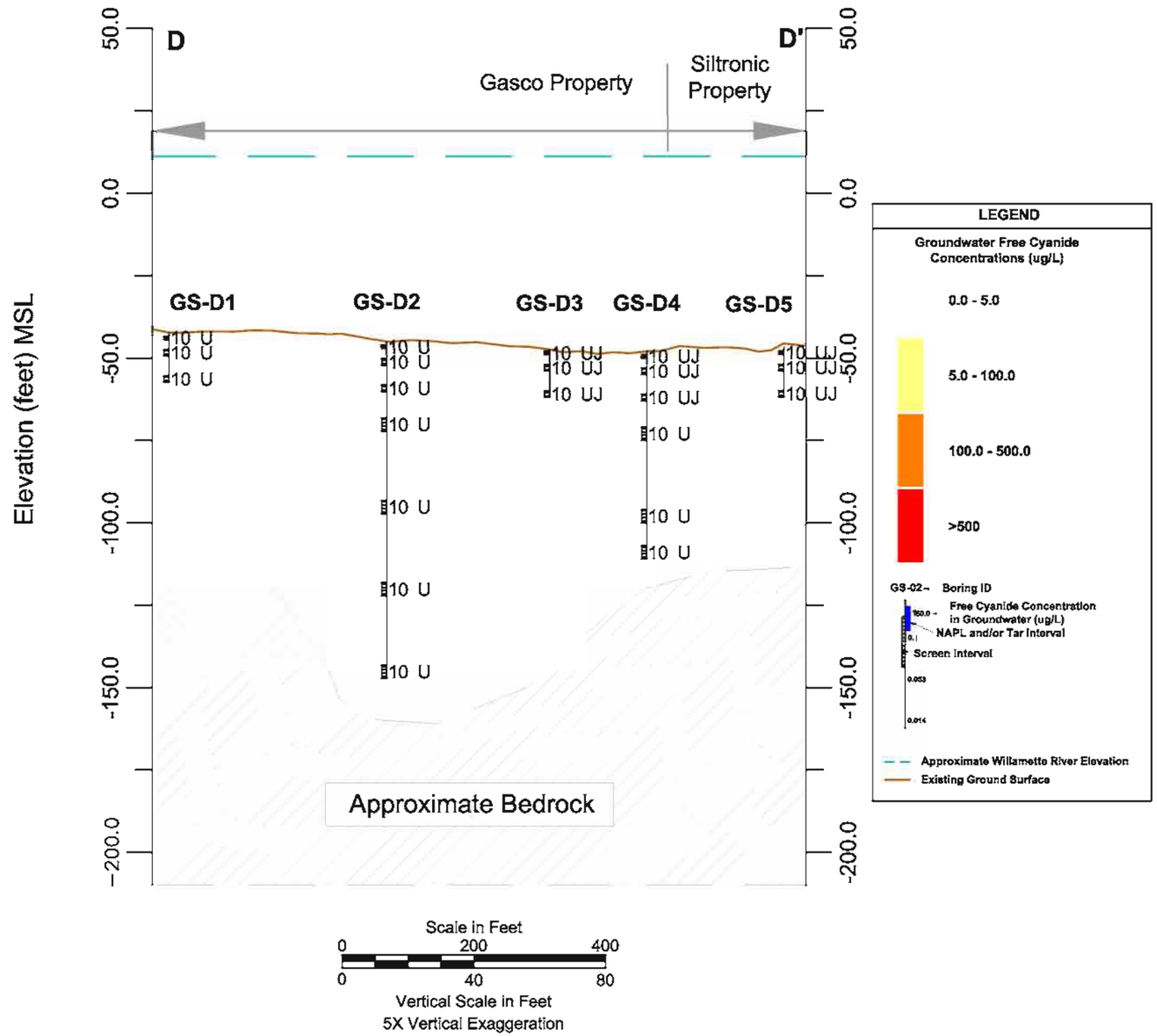
Figure 1.6e
Subsurface Profile C-C'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 24, 2008 2:58pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XSC

ANCHOR ENVIRONMENTAL, L.L.C.

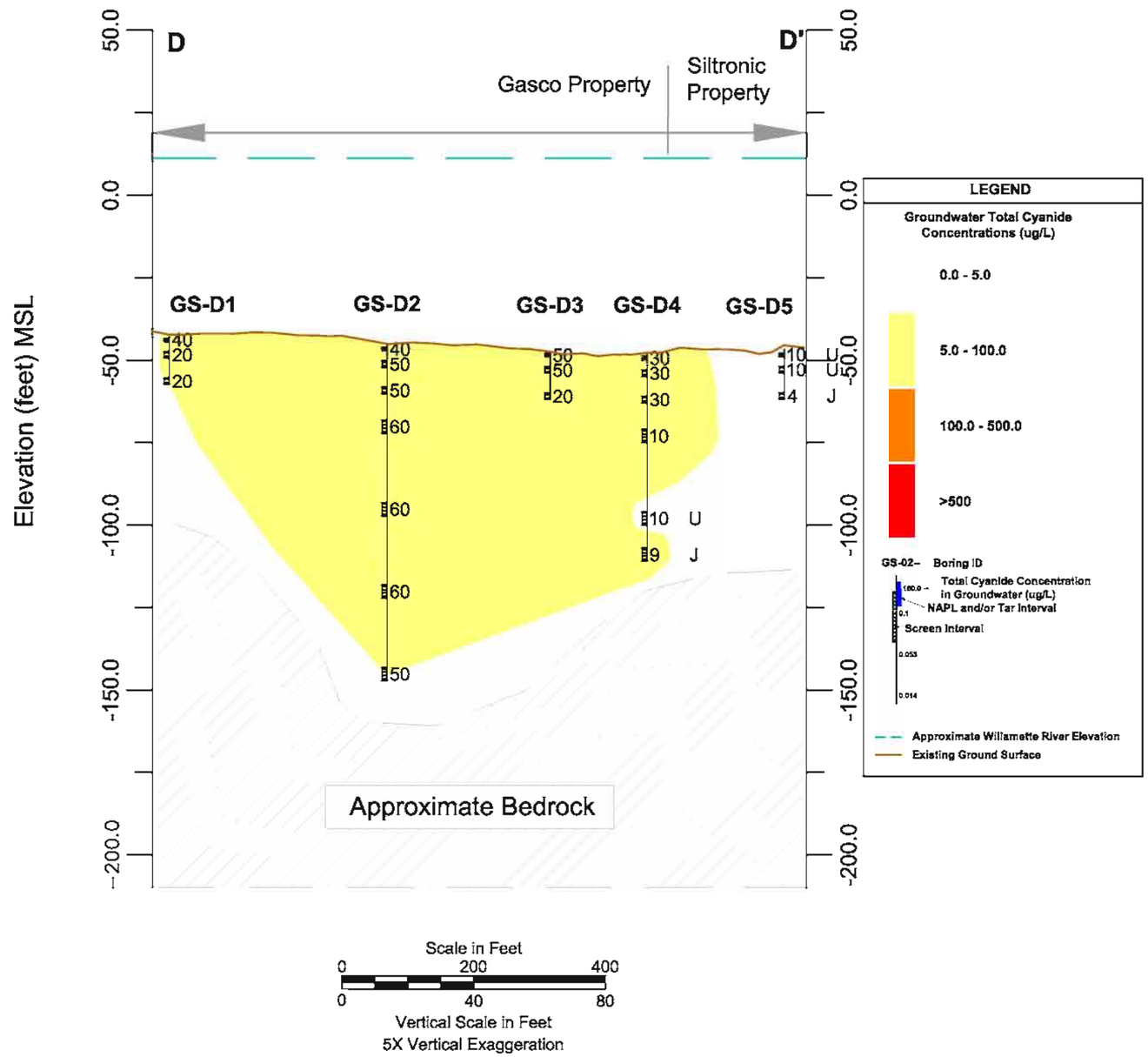
Figure 1.6f
Subsurface Profile C-C'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 24, 2008 2:50pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg XSD

ANCHOR ENVIRONMENTAL, L.L.C.

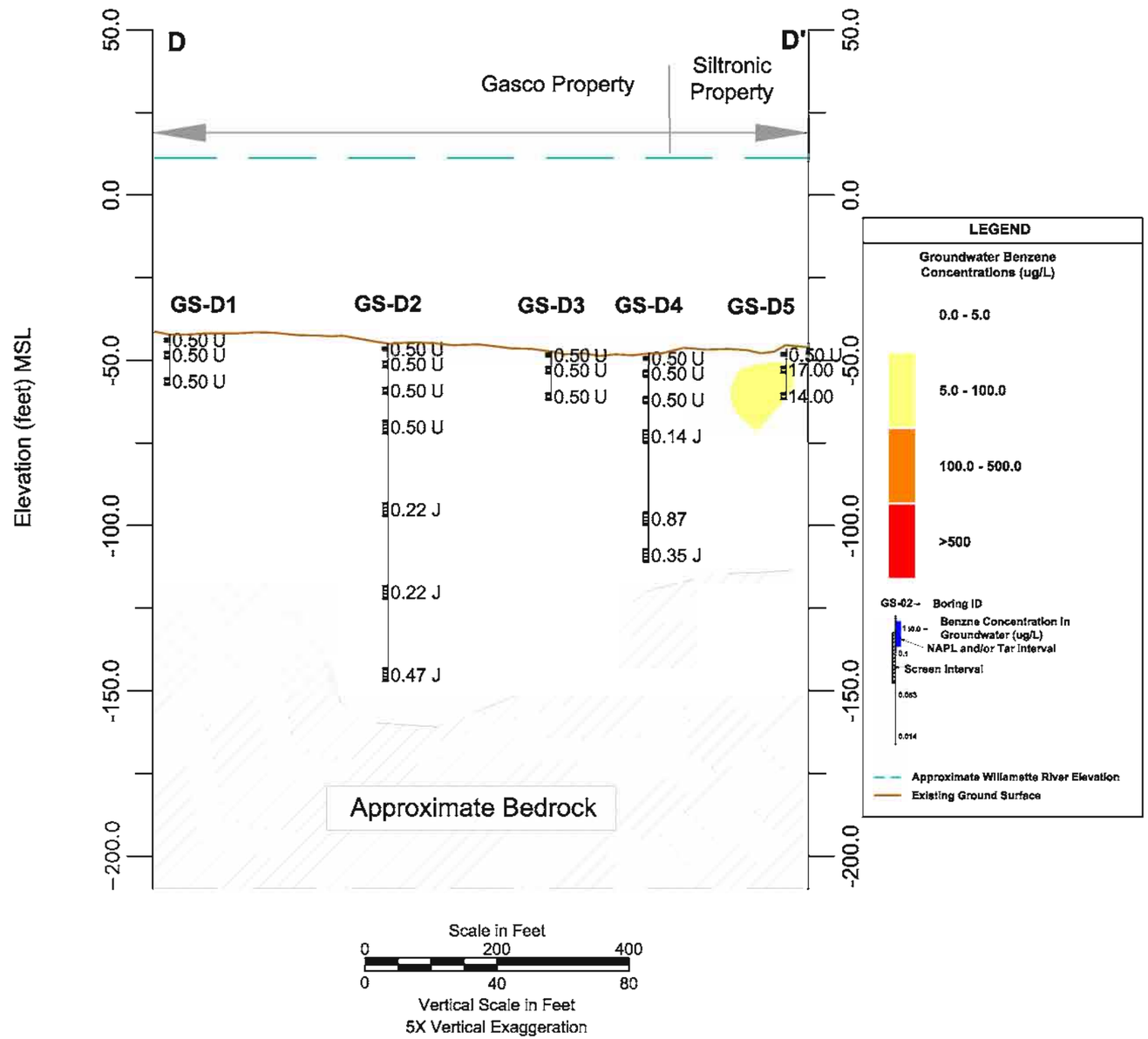
Figure 1.7a
Subsurface Profile D-D'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:46pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XSD

ANCHOR ENVIRONMENTAL, L.L.C.

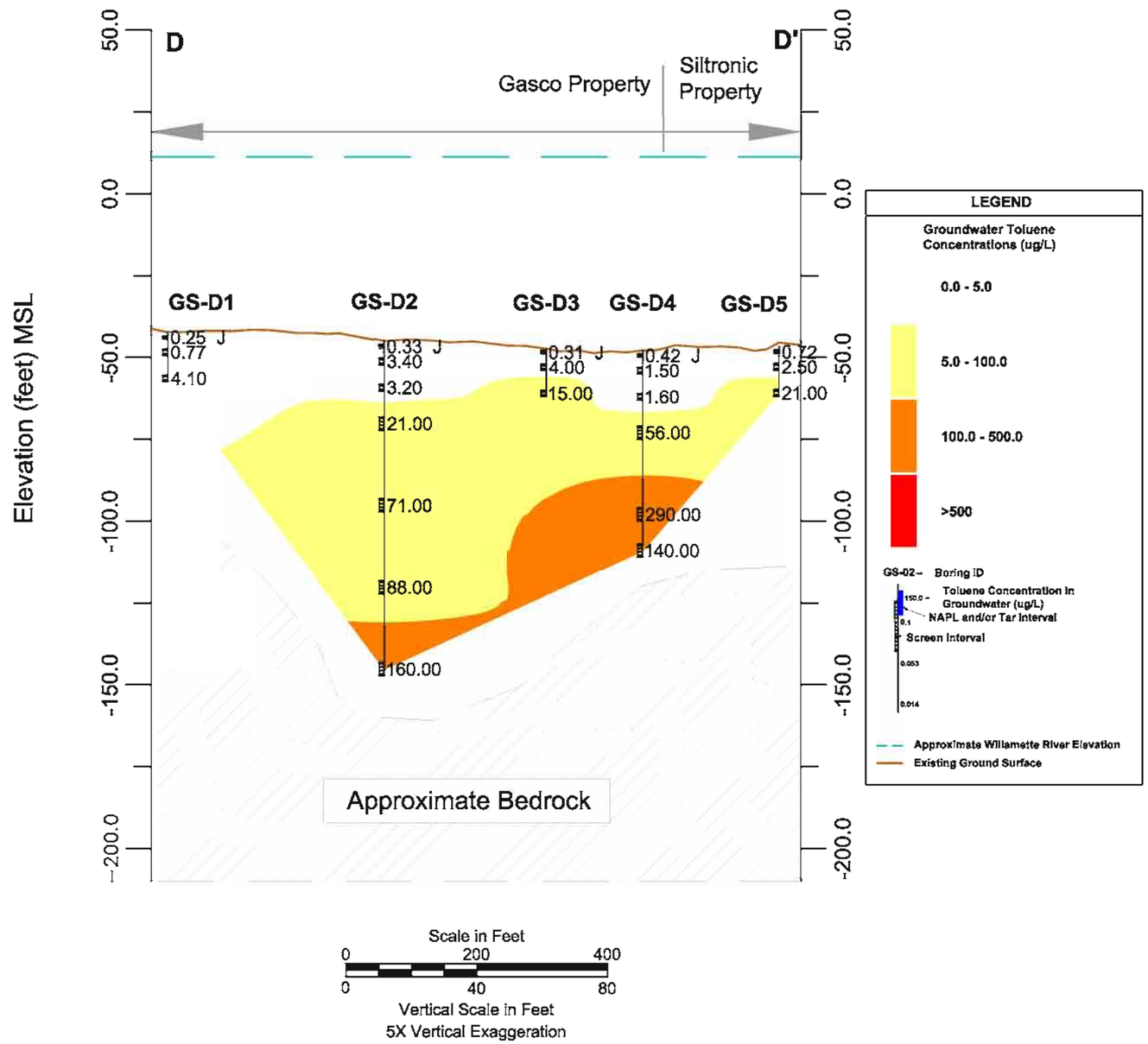
Figure 1.7b
Subsurface Profile D-D'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:50pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg D

ANCHOR ENVIRONMENTAL, L.L.C.

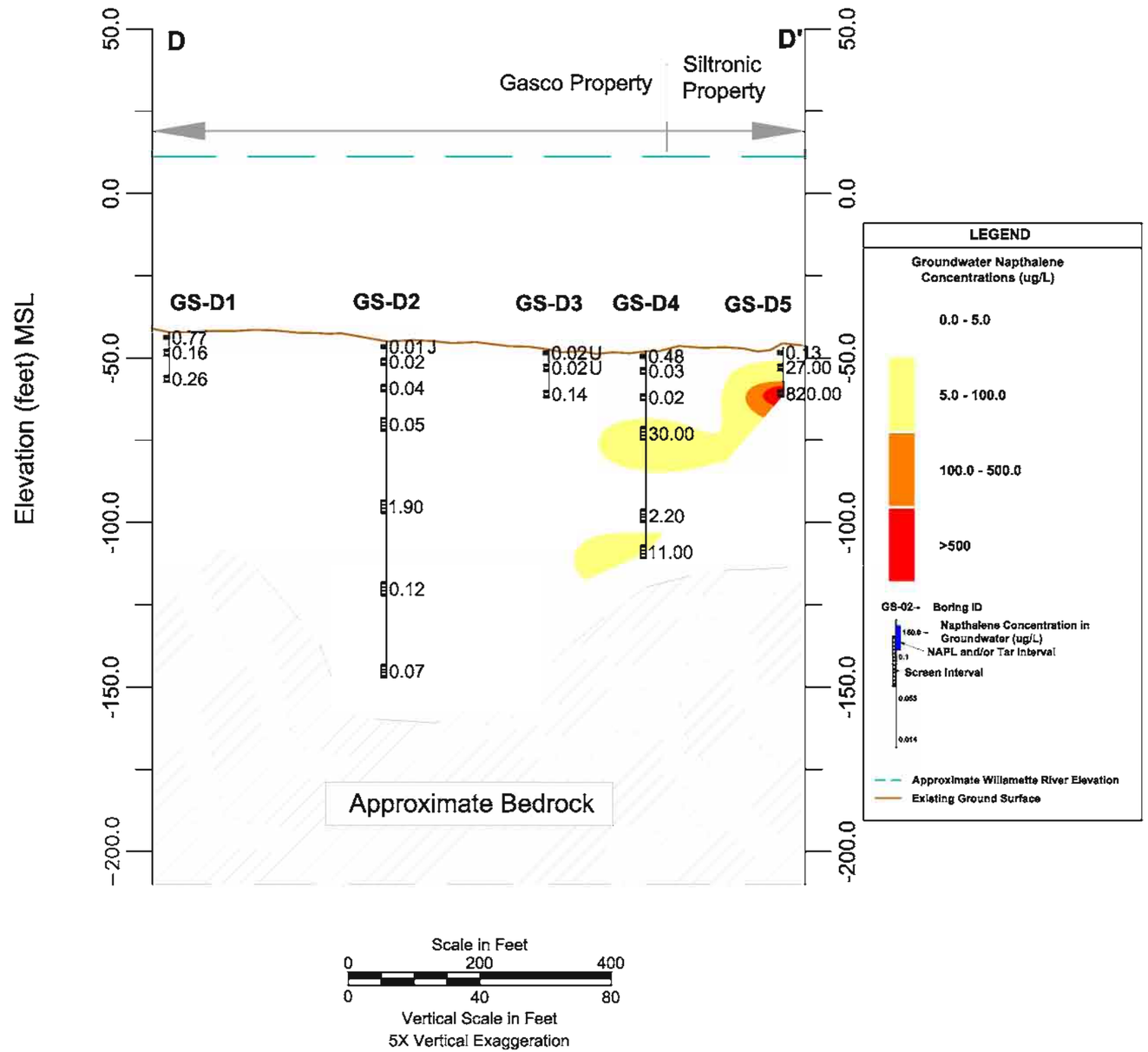
Figure 1.7c
Subsurface Profile D-D'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:54pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSD

ANCHOR ENVIRONMENTAL, L.L.C.

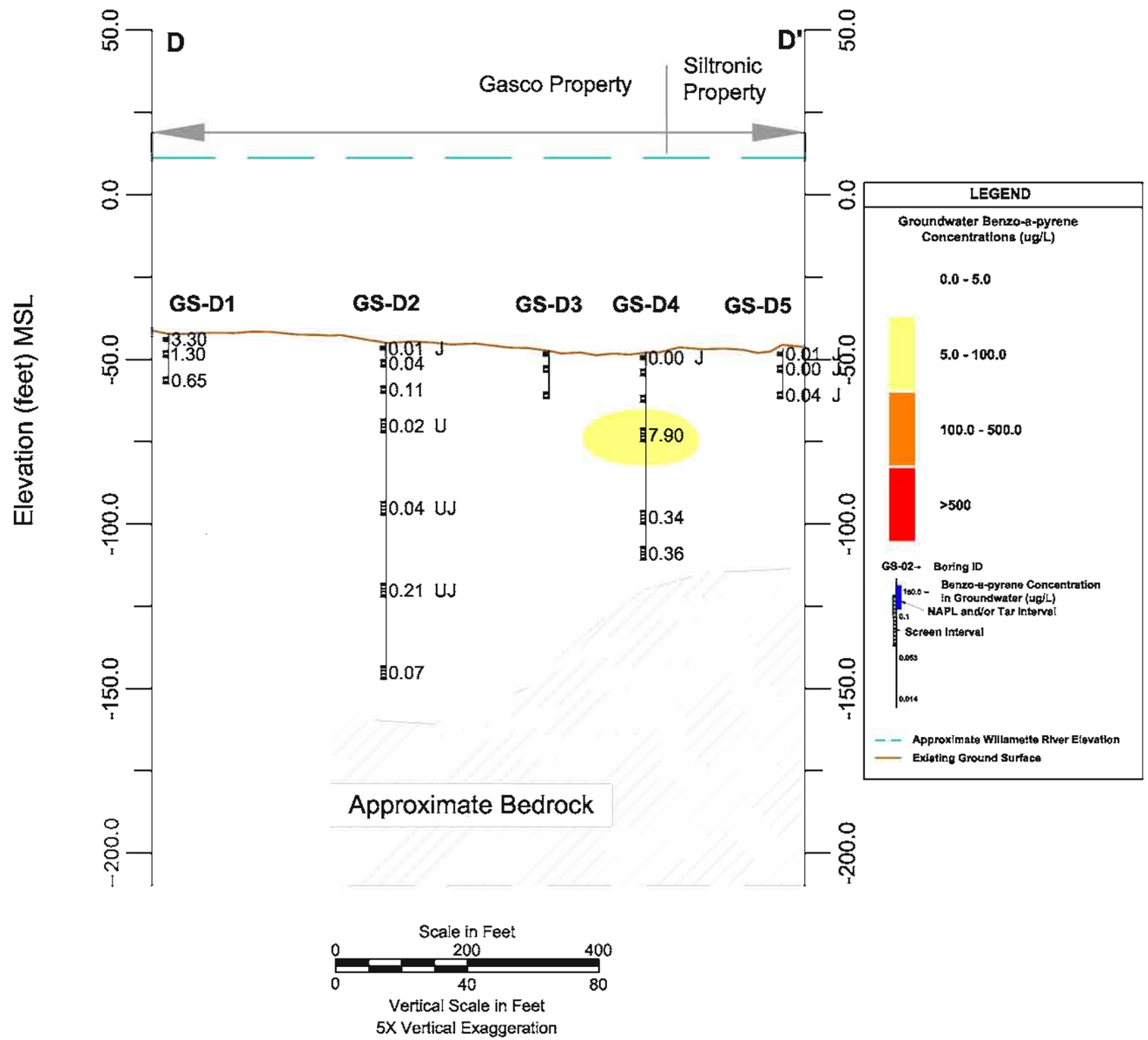
Figure 1.7d
Subsurface Profile D-D'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:58pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XSD

ANCHOR ENVIRONMENTAL, L.L.C.

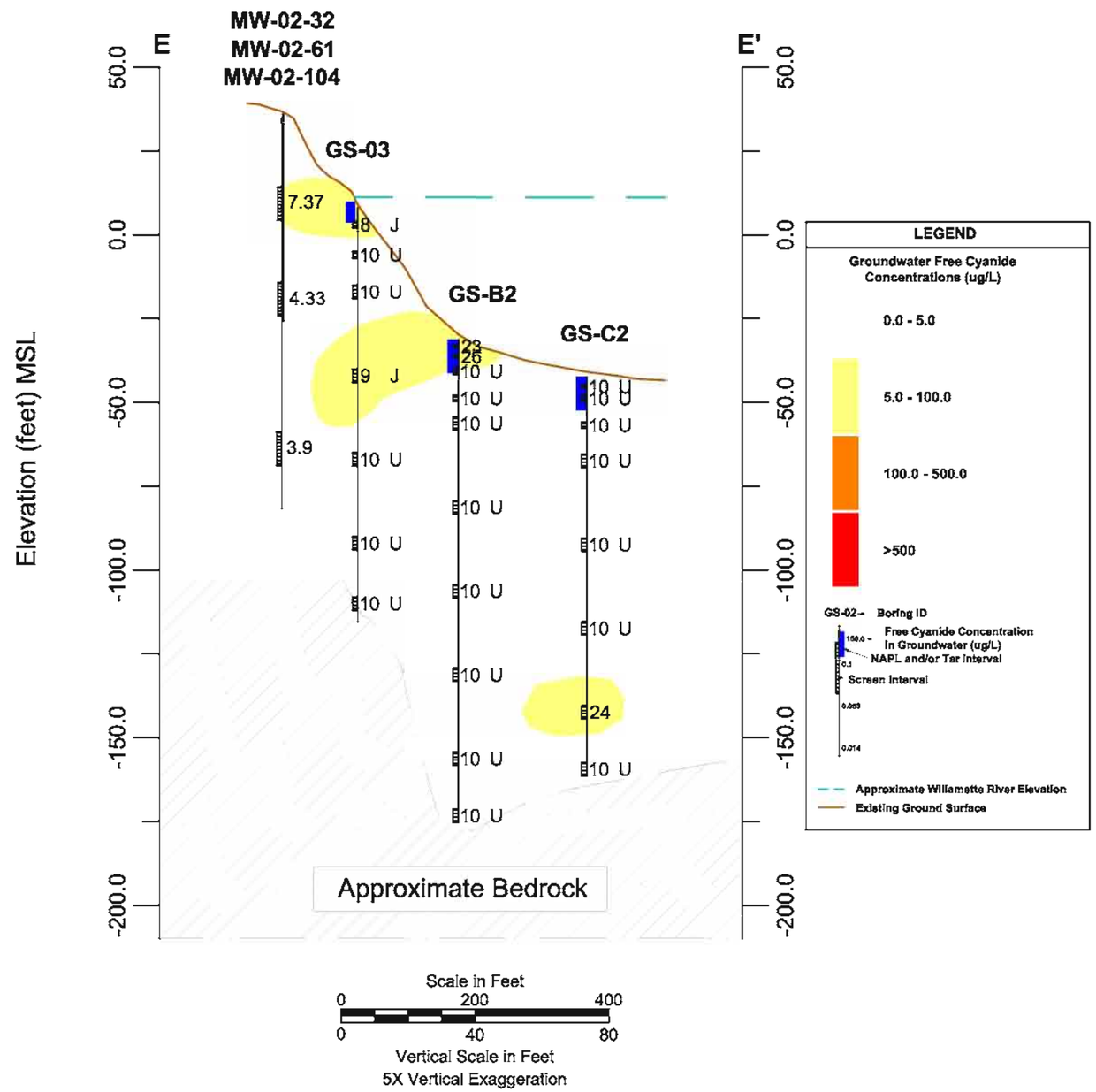
Figure 1.7e
Subsurface Profile D-D'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 24, 2008 2:59pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XSD

ANCHOR ENVIRONMENTAL, L.L.C.

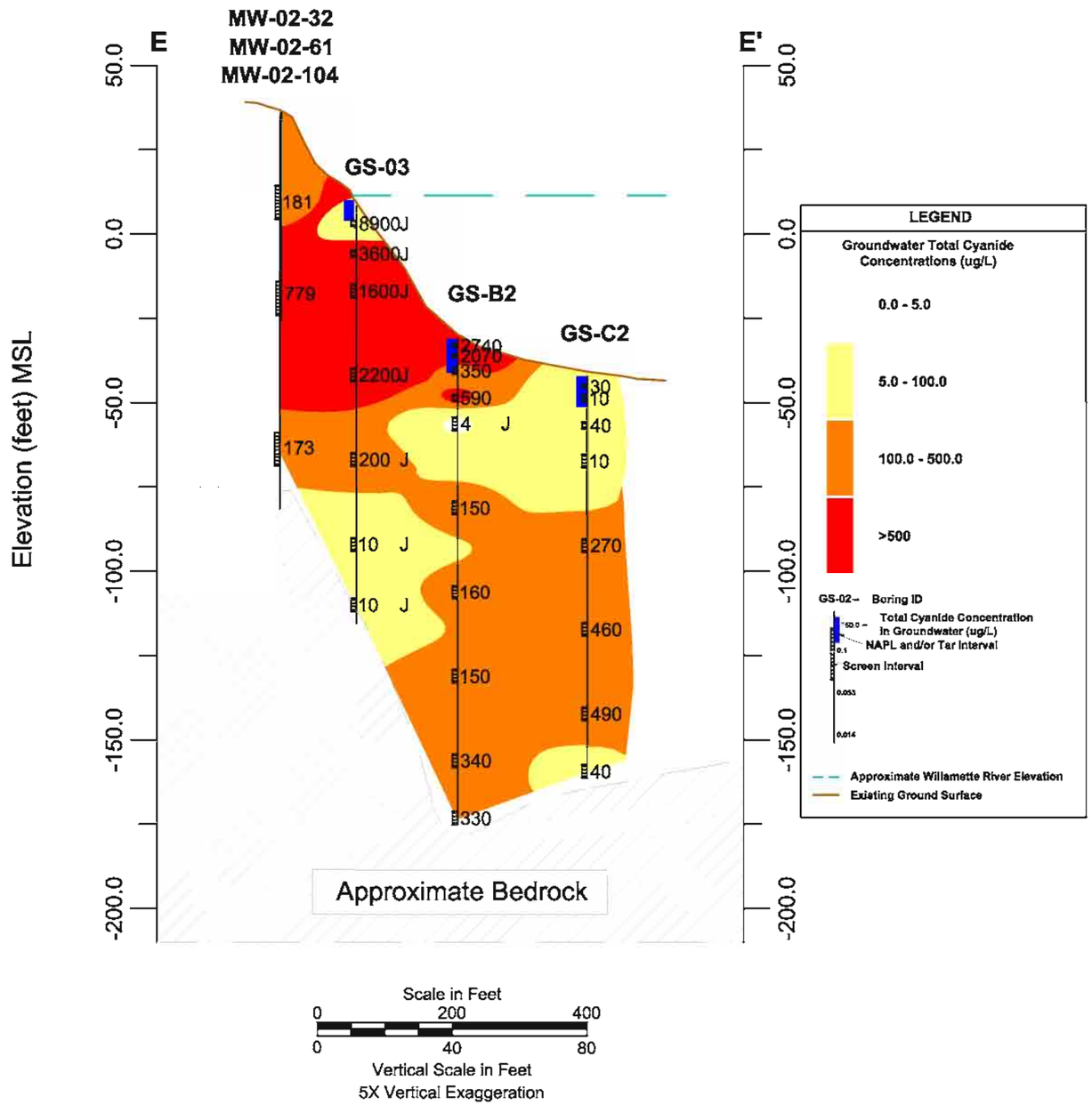
Figure 1.7f
Subsurface Profile D-D'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 28, 2008 9:00pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg XSE

ANCHOR ENVIRONMENTAL, L.L.C.

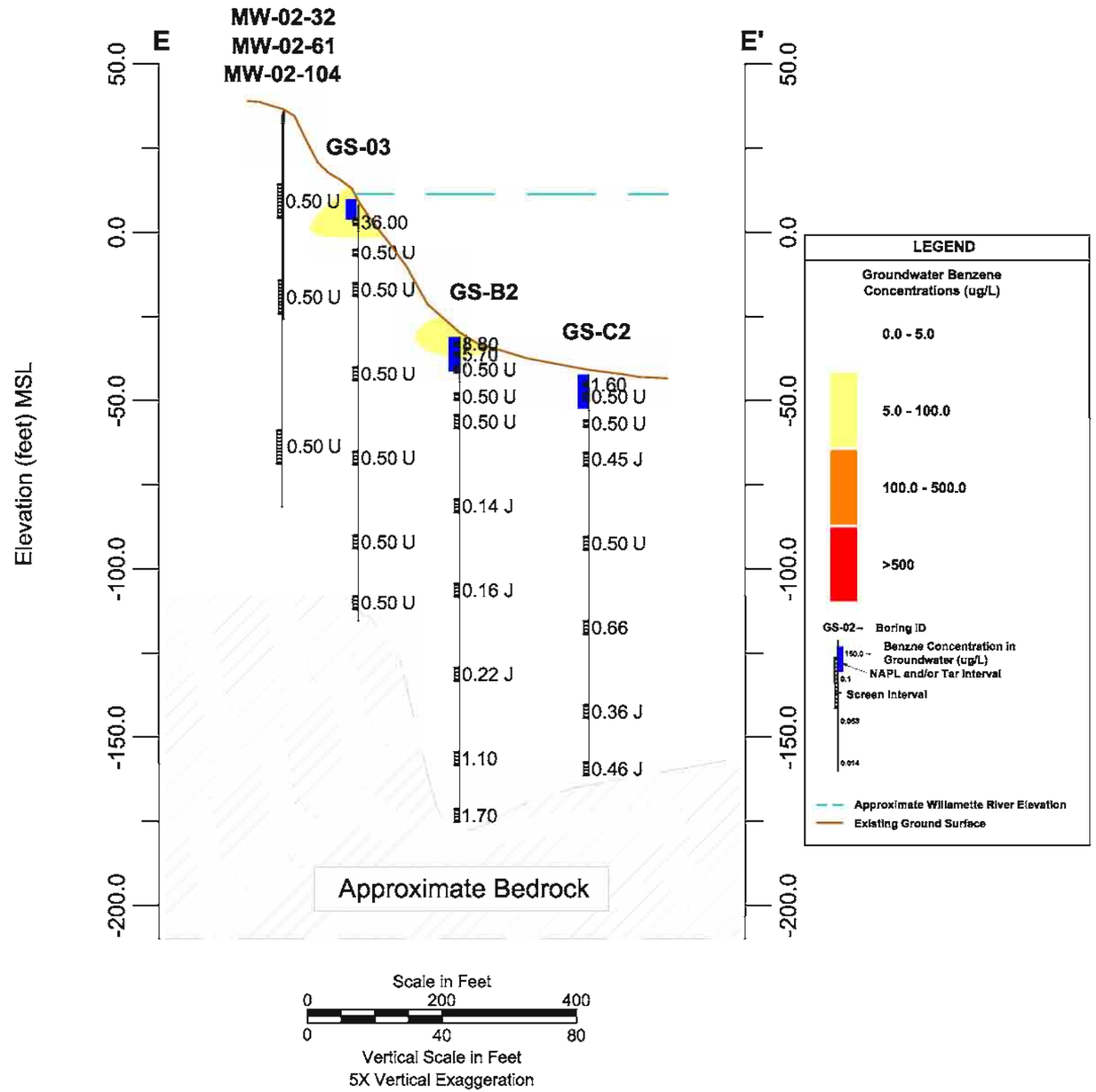
Figure 1.8a
Subsurface Profile E-E'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:46pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XSE

ANCHOR ENVIRONMENTAL, L.L.C.

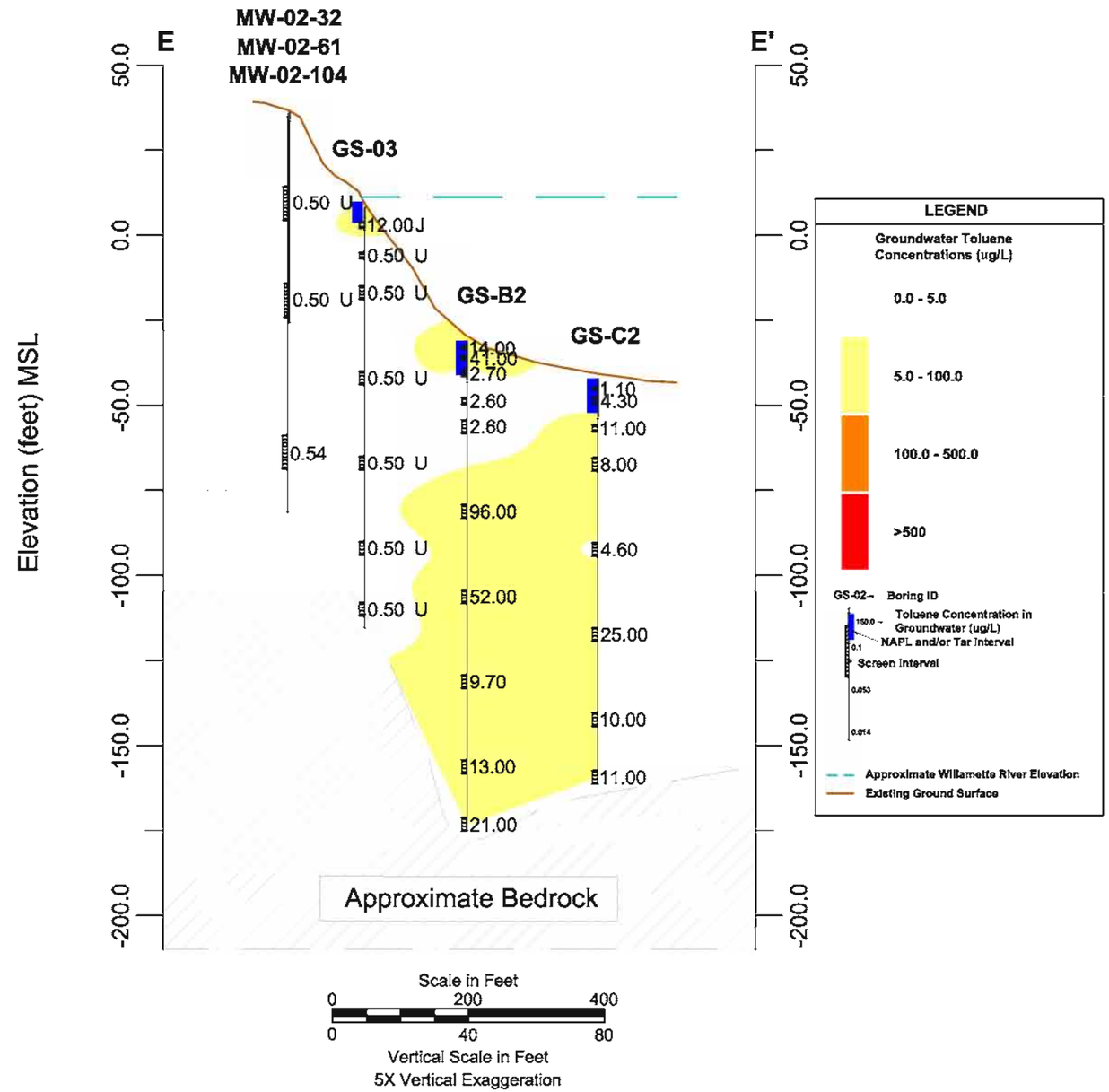
Figure 1.8b
Subsurface Profile E-E'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:50pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg E

ANCHOR ENVIRONMENTAL, L.L.C.

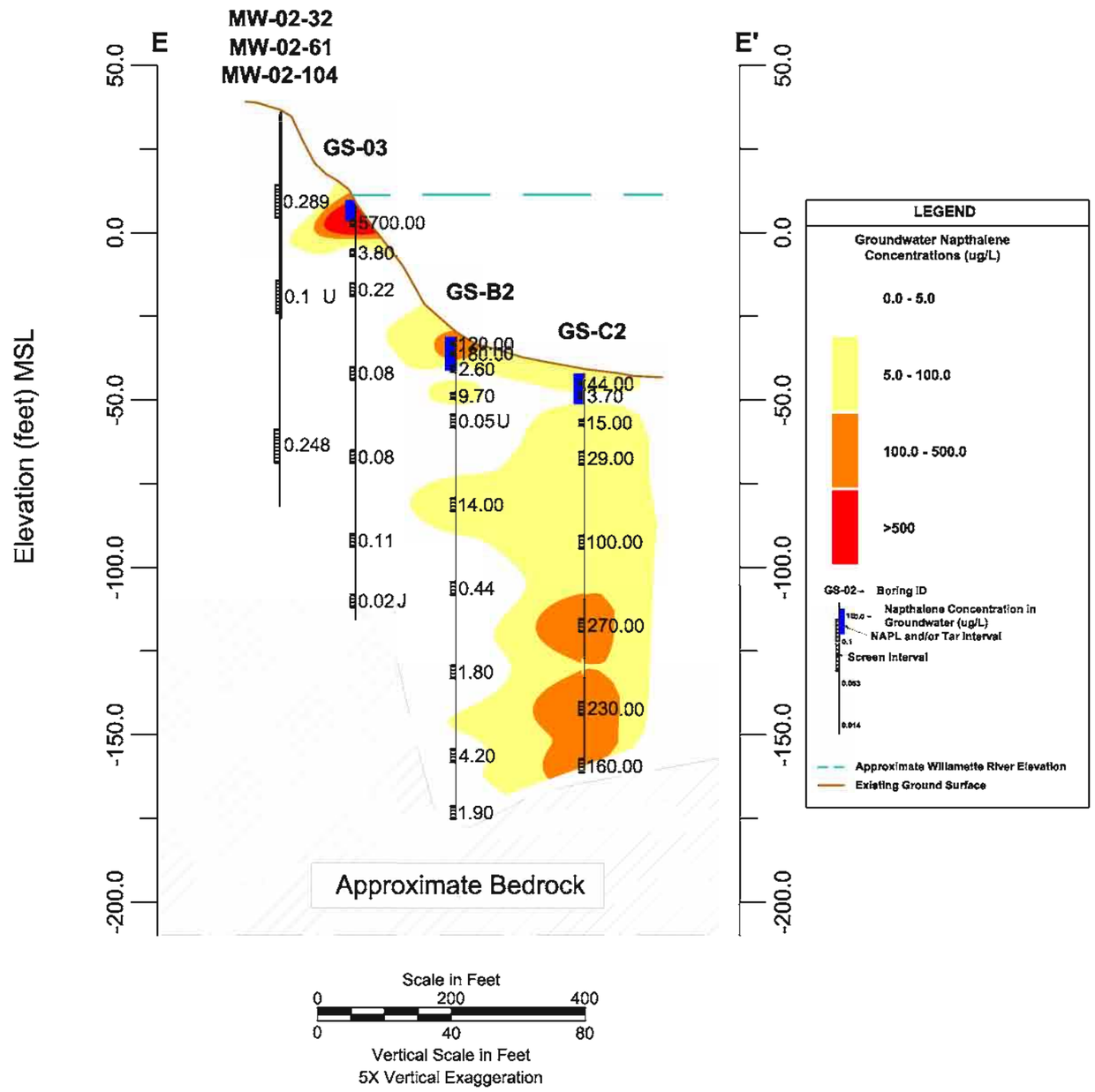
Figure 1.8 c
Subsurface Profile E-E'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:54pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSE

ANCHOR ENVIRONMENTAL, L.L.C.

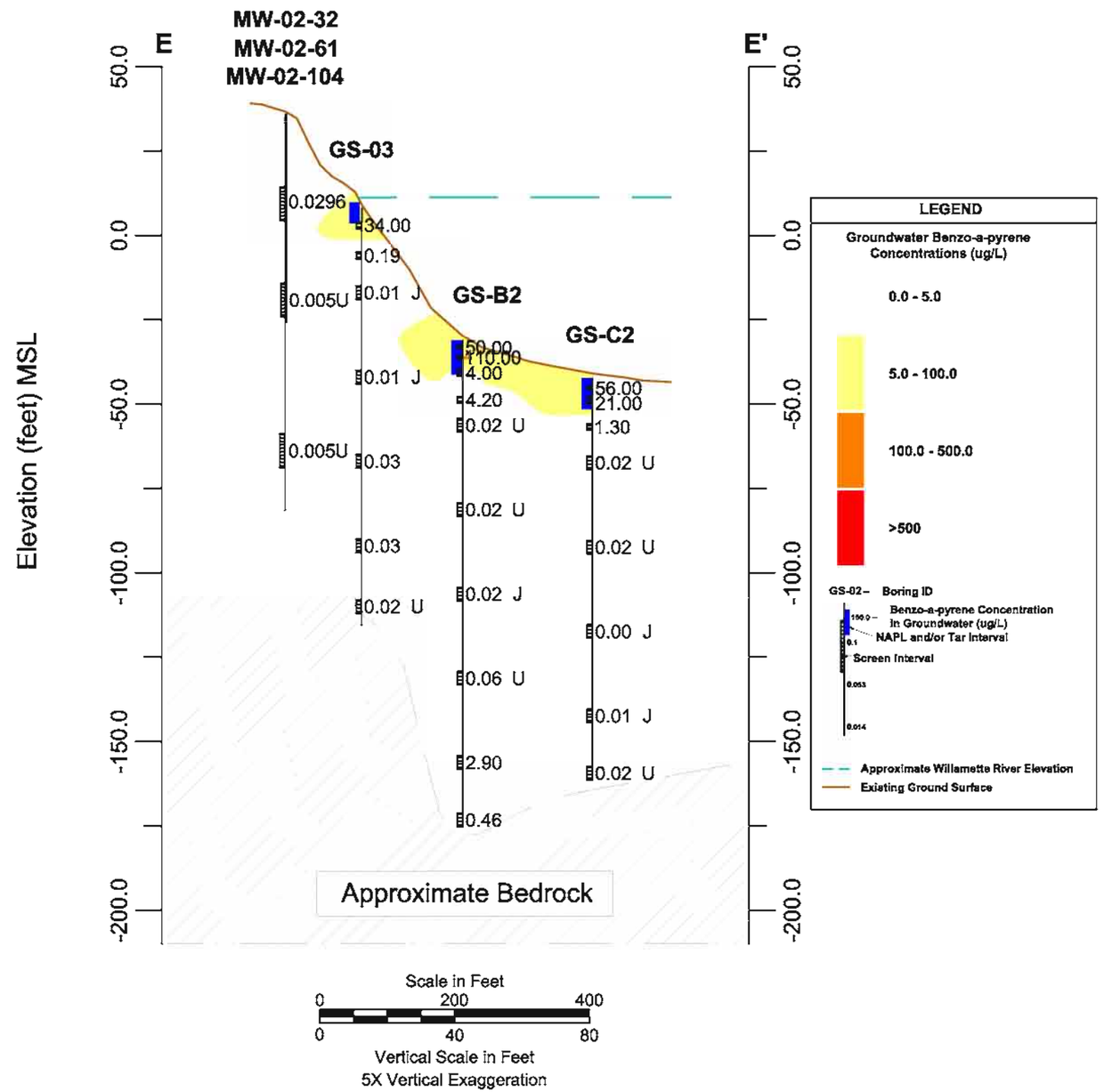
Figure 1.8d
Subsurface Profile E-E'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:57pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XSE

ANCHOR ENVIRONMENTAL, L.L.C.

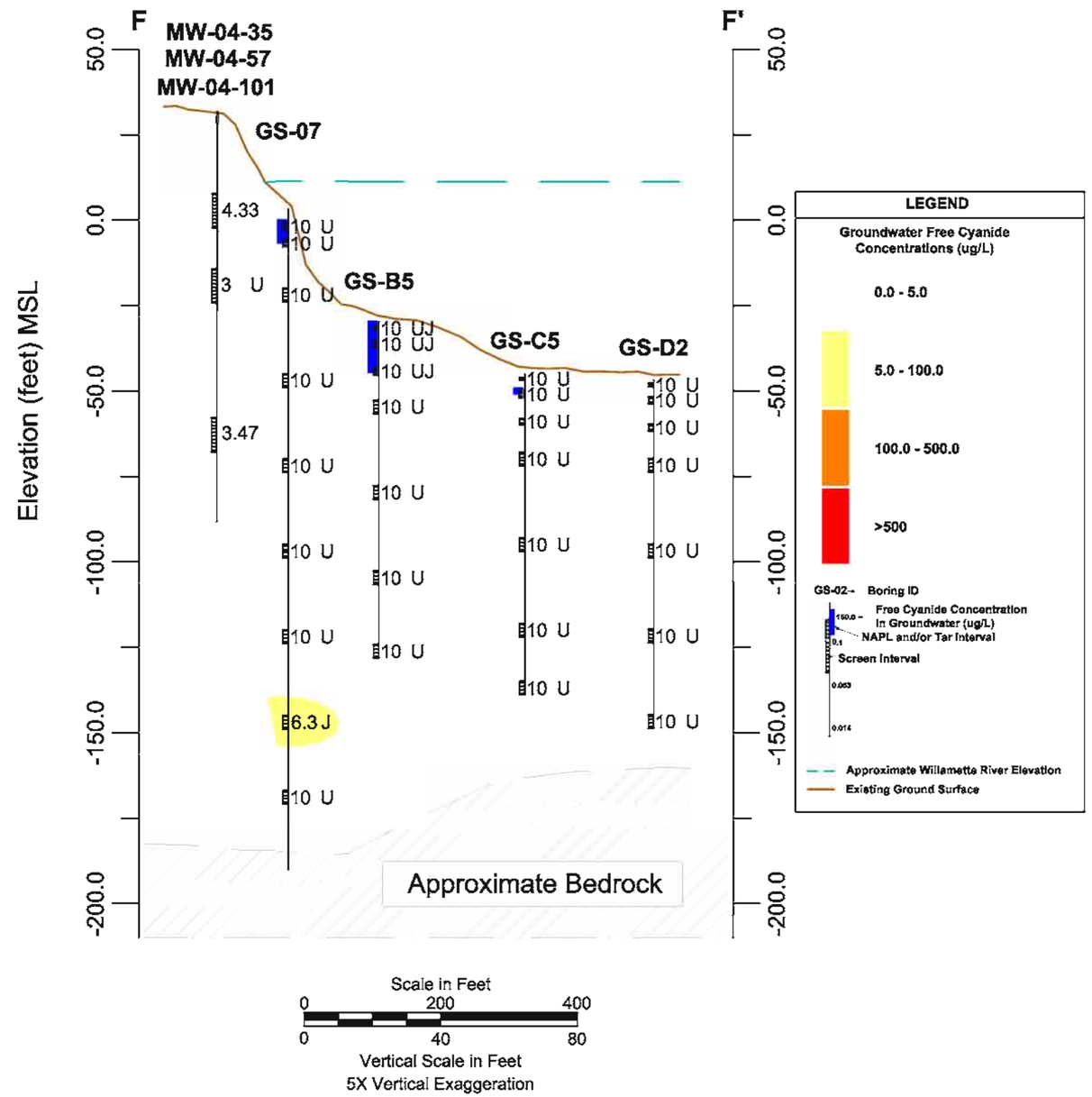
Figure 1.8e
Subsurface Profile E-E'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 28, 2008 8:57pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XSE

ANCHOR ENVIRONMENTAL, L.L.C.

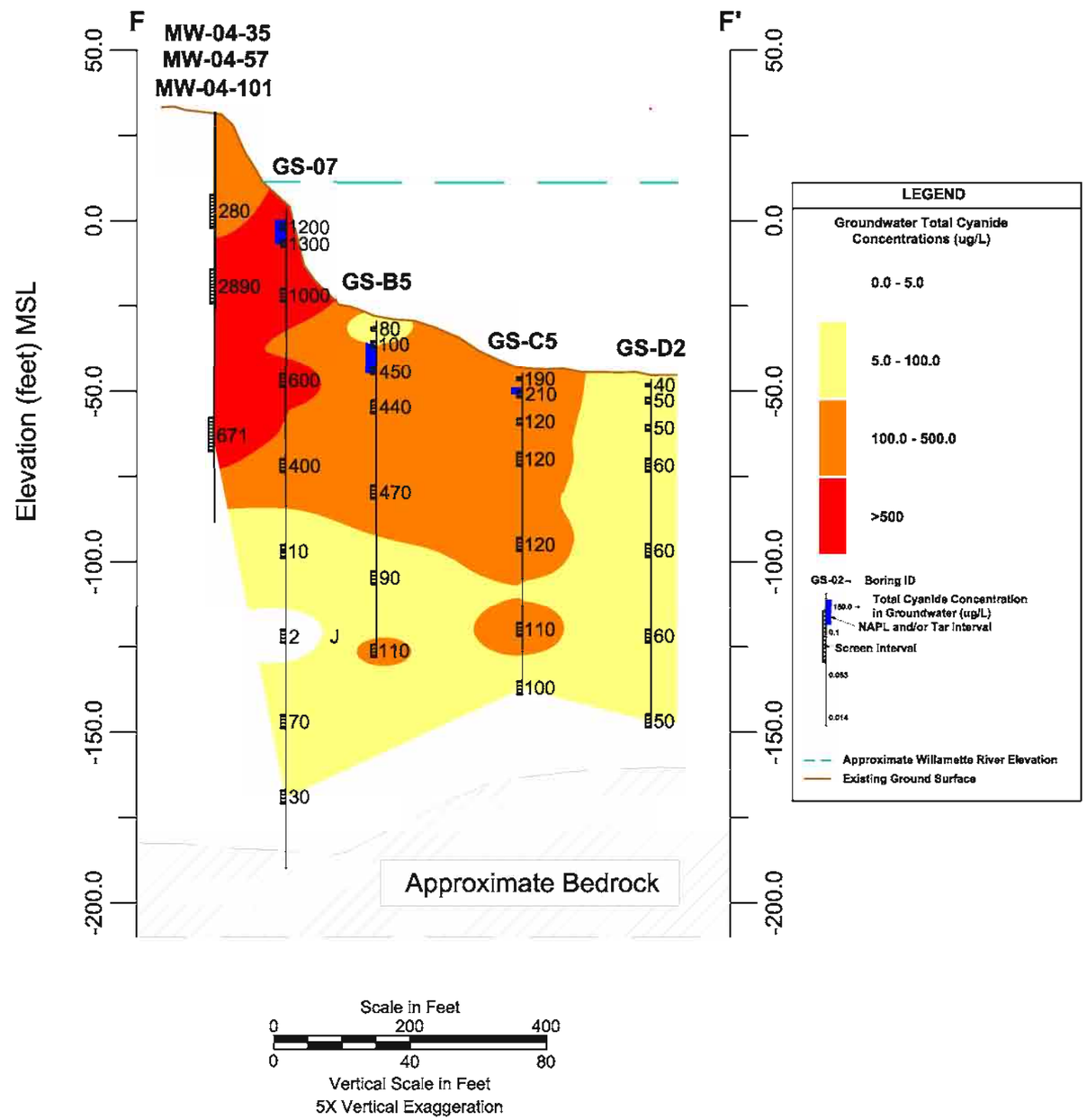
Figure 1.8f
Subsurface Profile E-E'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 28, 2008 9:01pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg XSF

ANCHOR ENVIRONMENTAL, L.L.C.

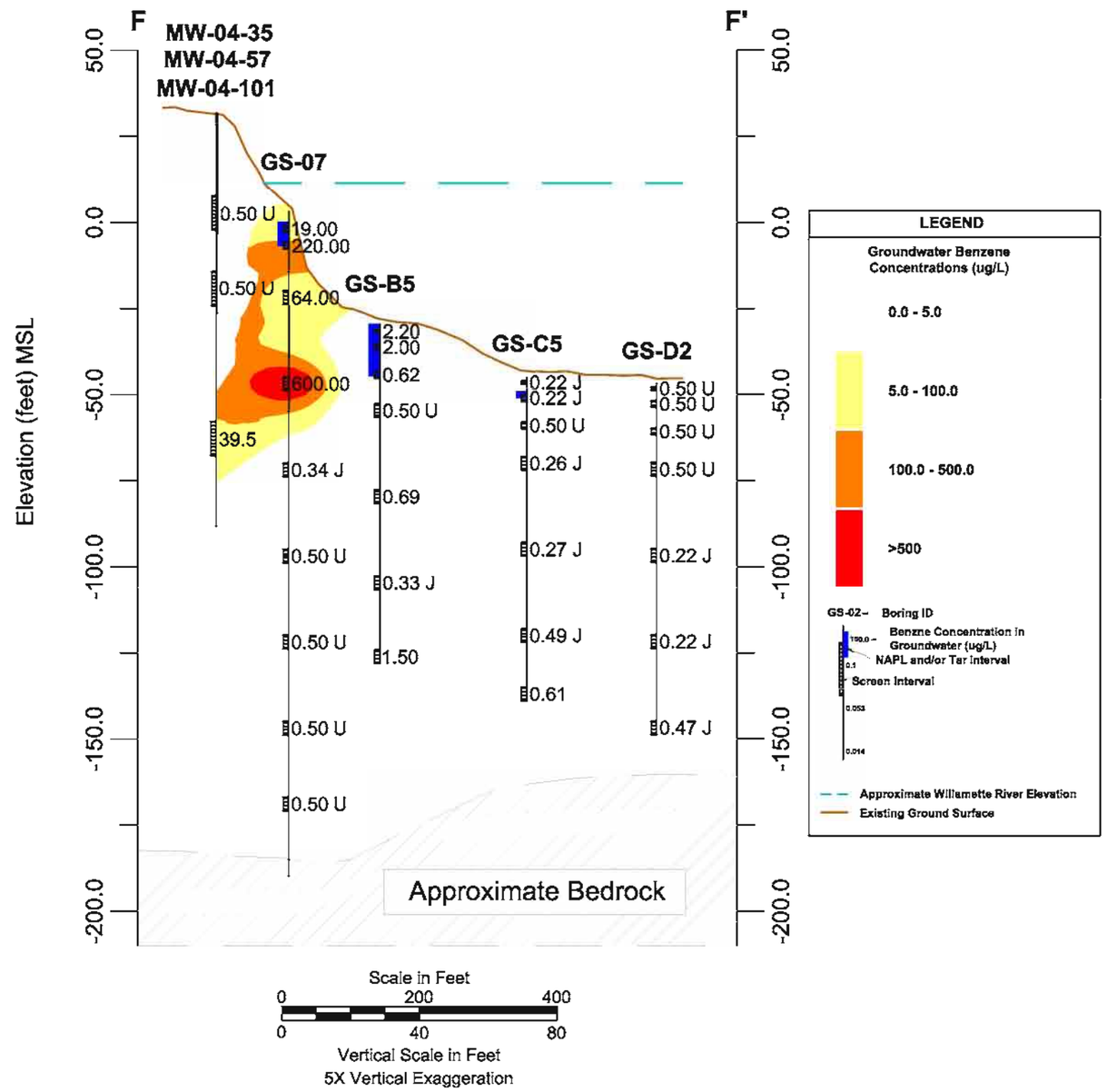
Figure 1.9a
Subsurface Profile F-F'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:45pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XSF

ANCHOR ENVIRONMENTAL, L.L.C.

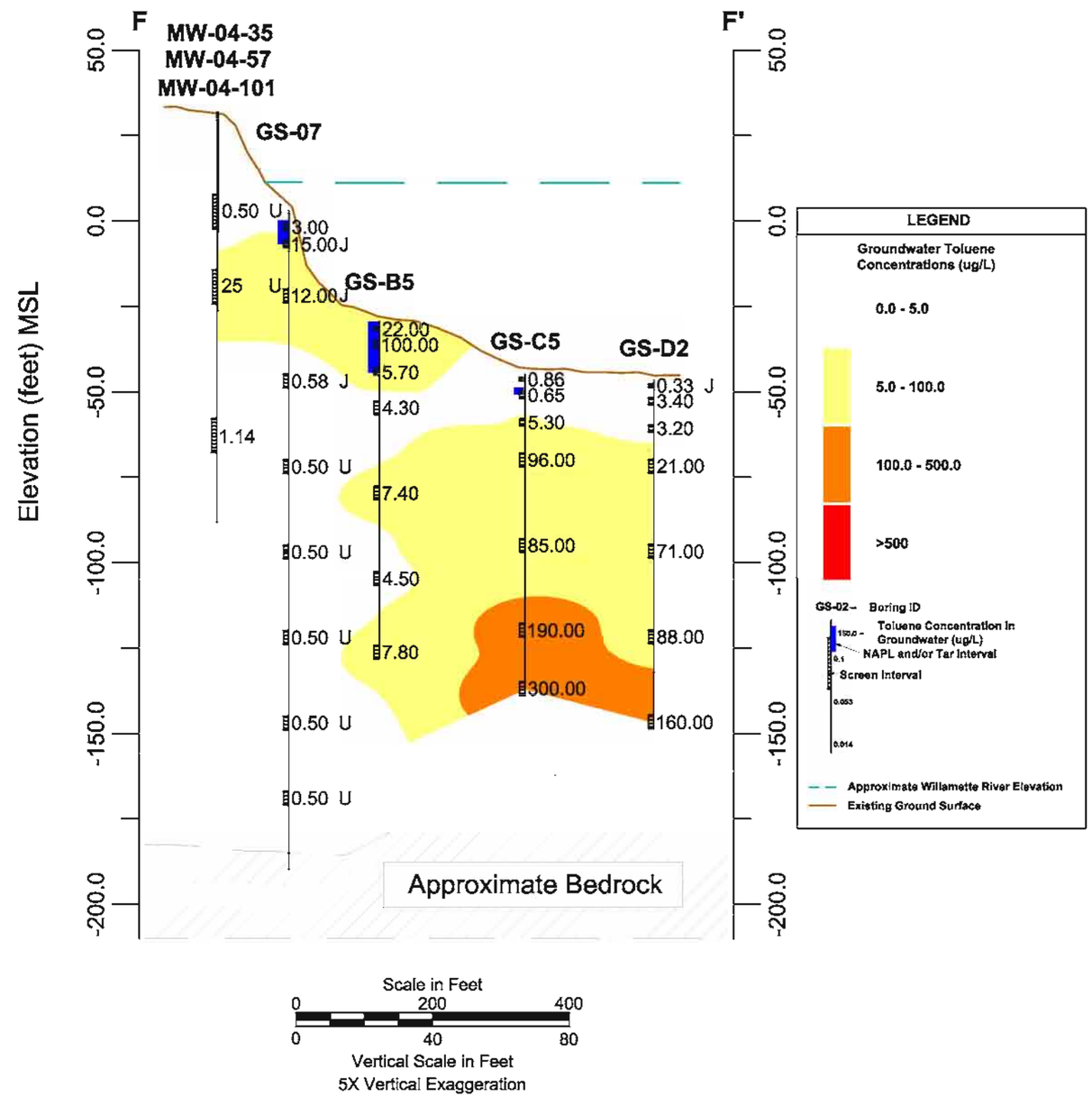
Figure 1.9b
Subsurface Profile F-F'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:49pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg F

ANCHOR ENVIRONMENTAL, L.L.C.

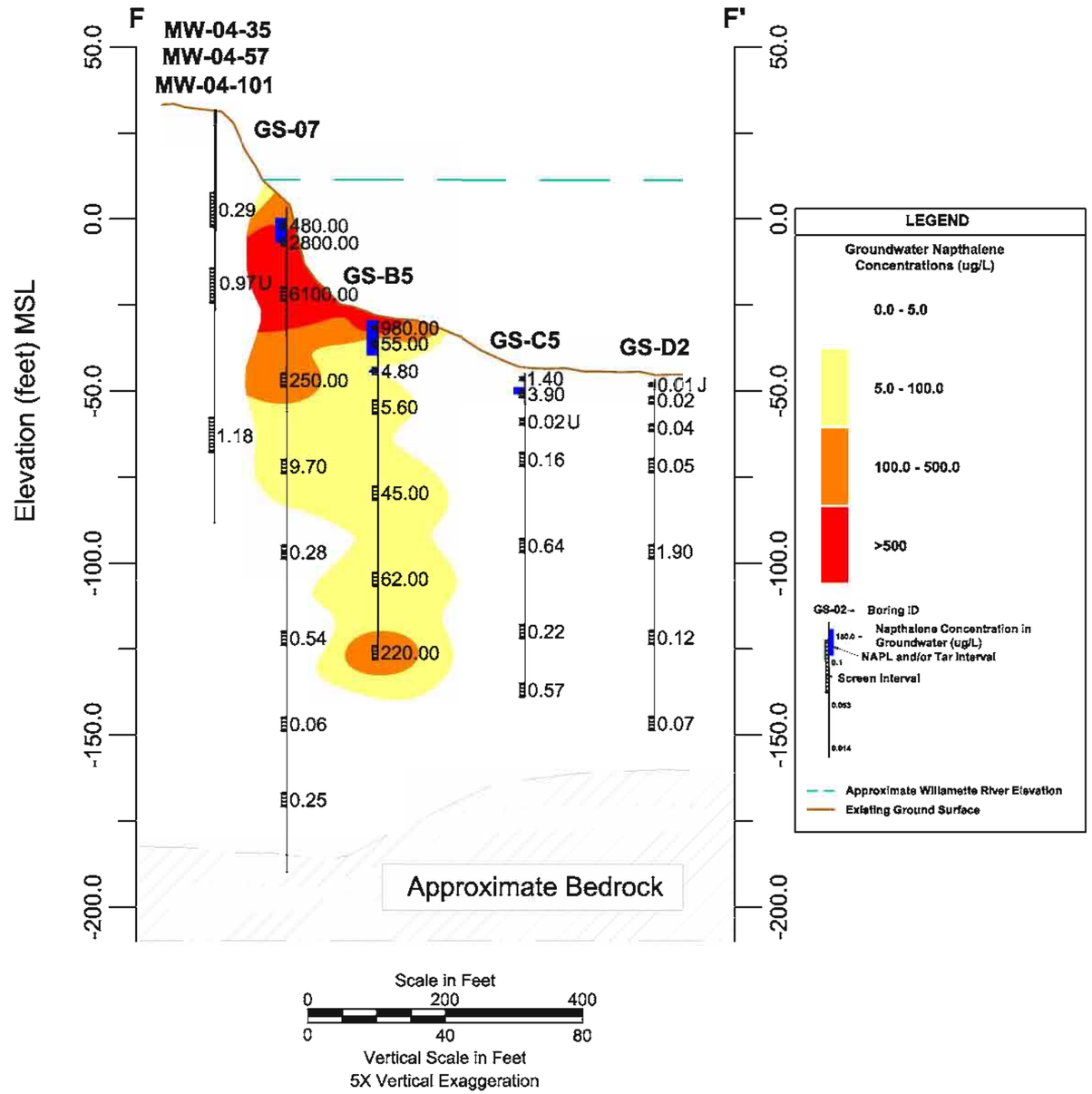
Figure 1.9c
Subsurface Profile F-F'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:53pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSF

ANCHOR ENVIRONMENTAL, L.L.C.

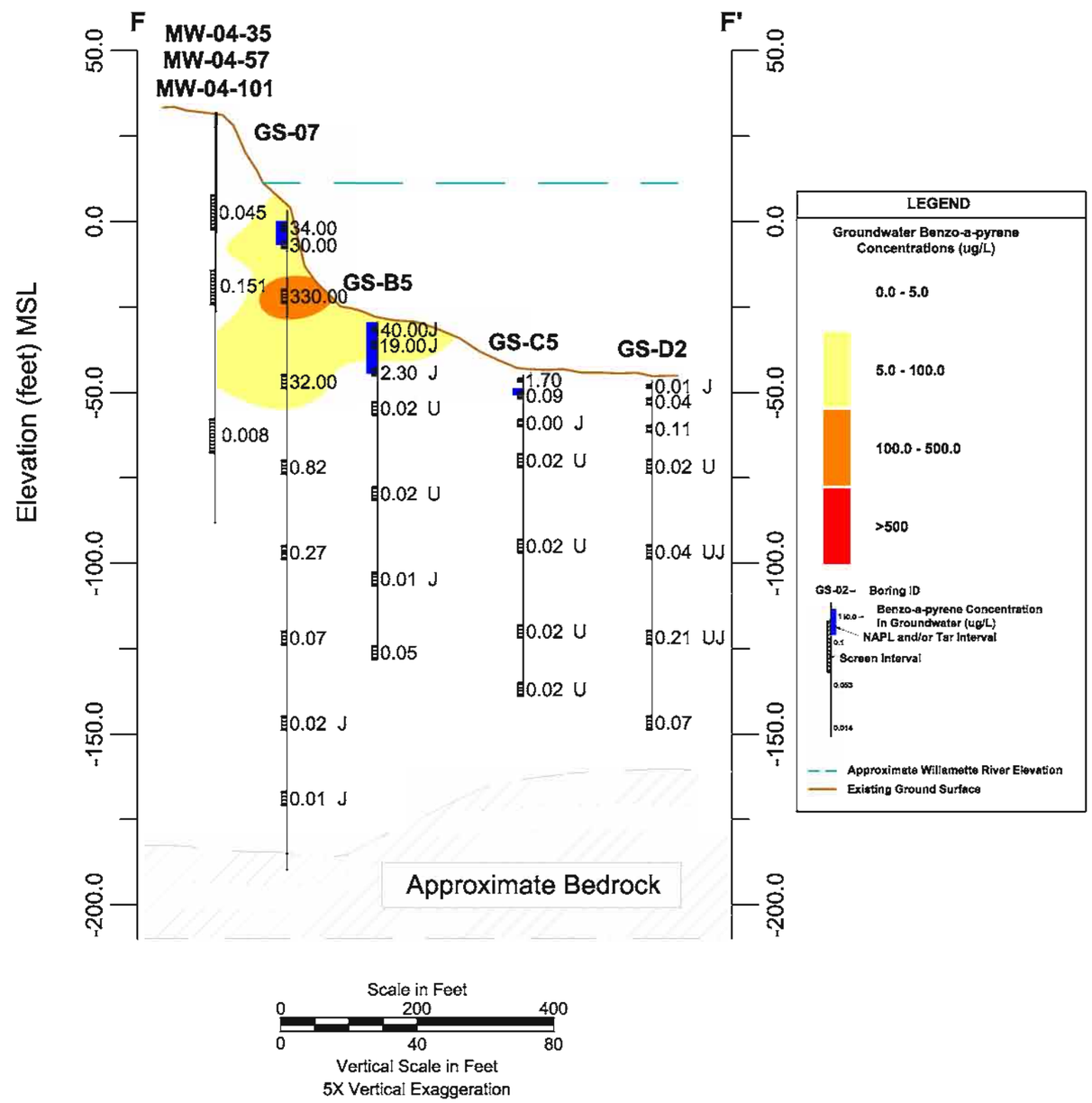
Figure 1.9d
Subsurface Profile F-F'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:57pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XSF

ANCHOR ENVIRONMENTAL, L.L.C.

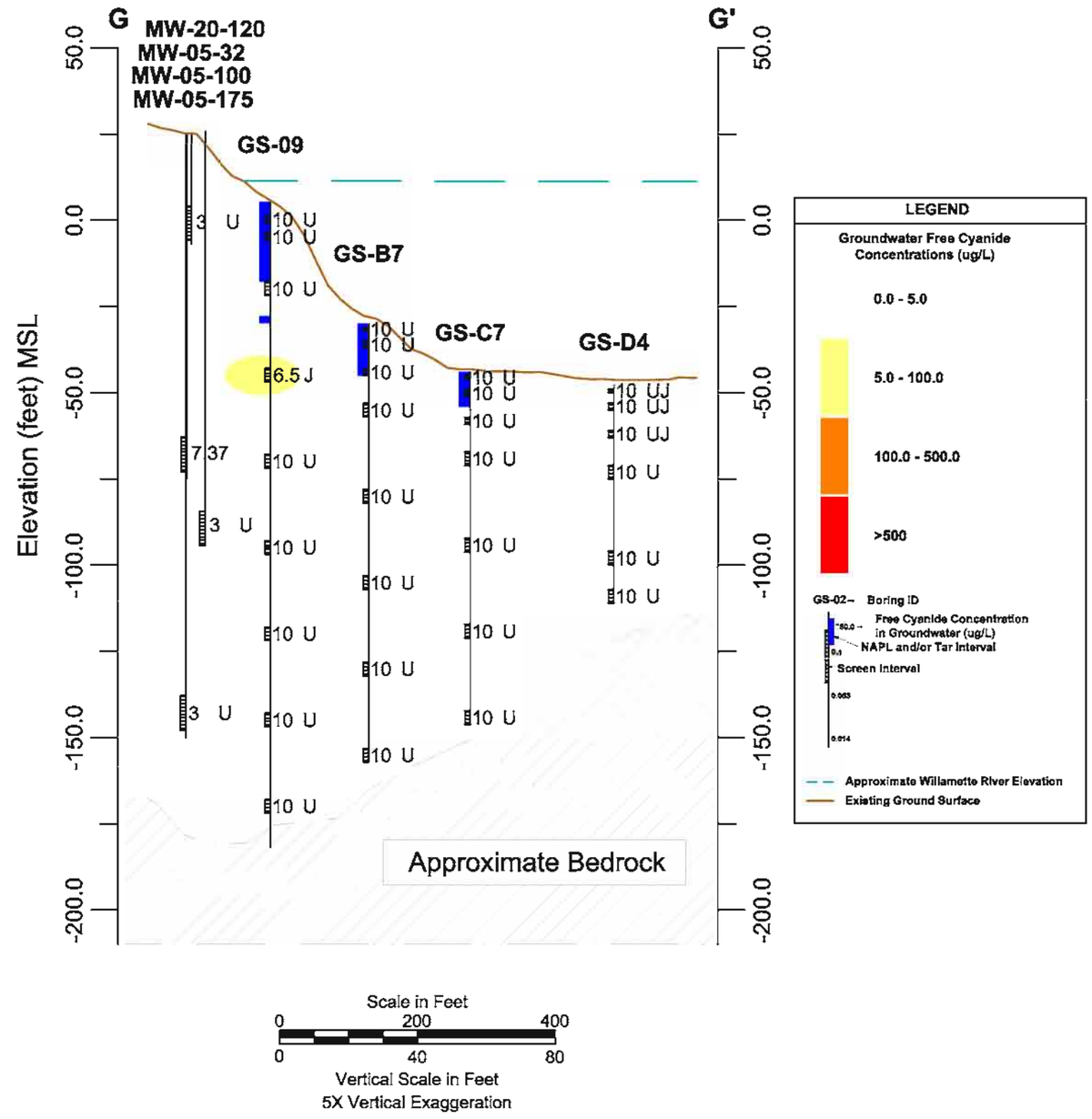
Figure 1.9e
Subsurface Profile F-F'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 28, 2008 8:57pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XSF

ANCHOR ENVIRONMENTAL, L.L.C.

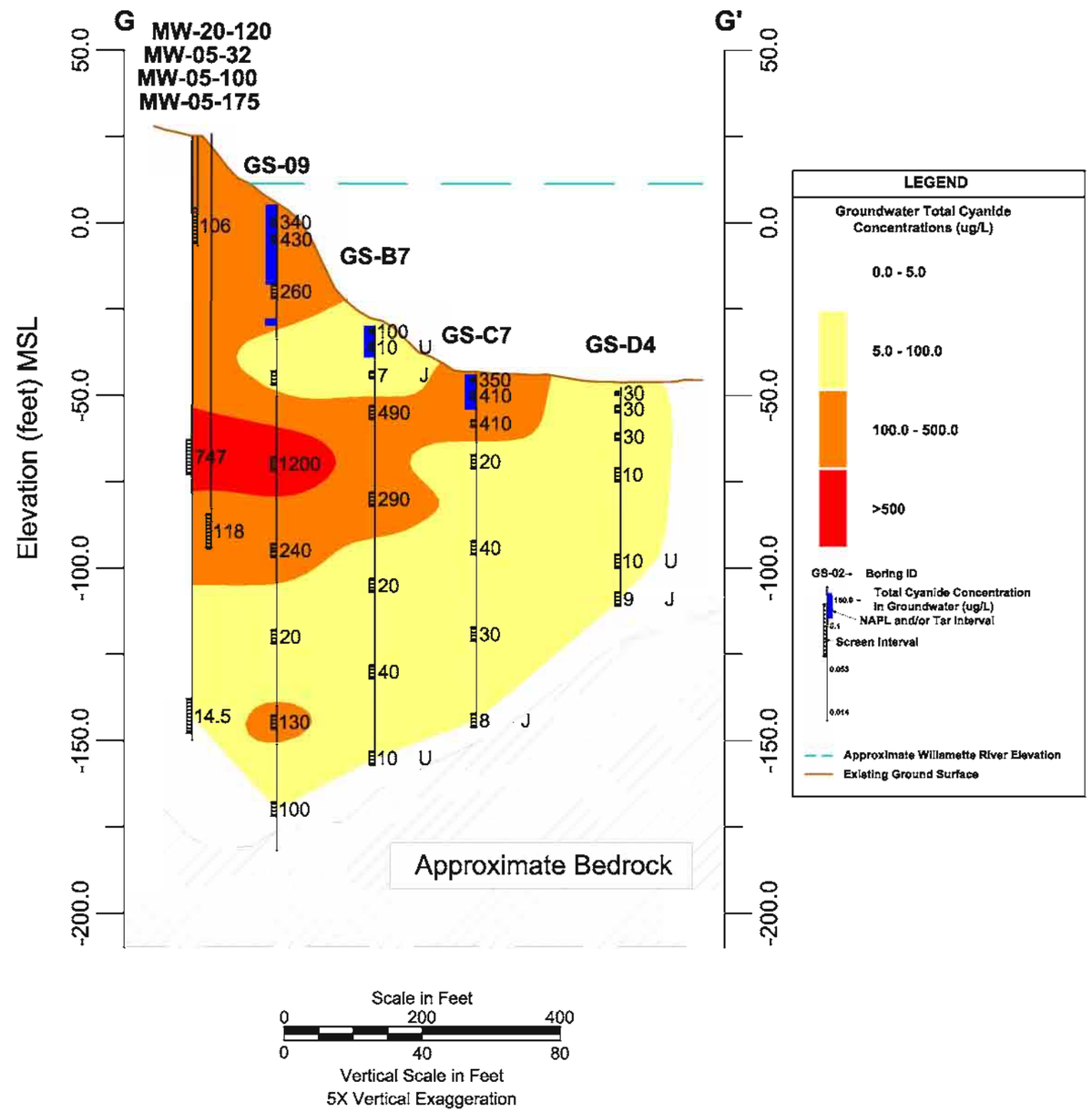
Figure 1.9f
Subsurface Profile F-F'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 28, 2008 9:01pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg XSG

ANCHOR ENVIRONMENTAL, L.L.C.

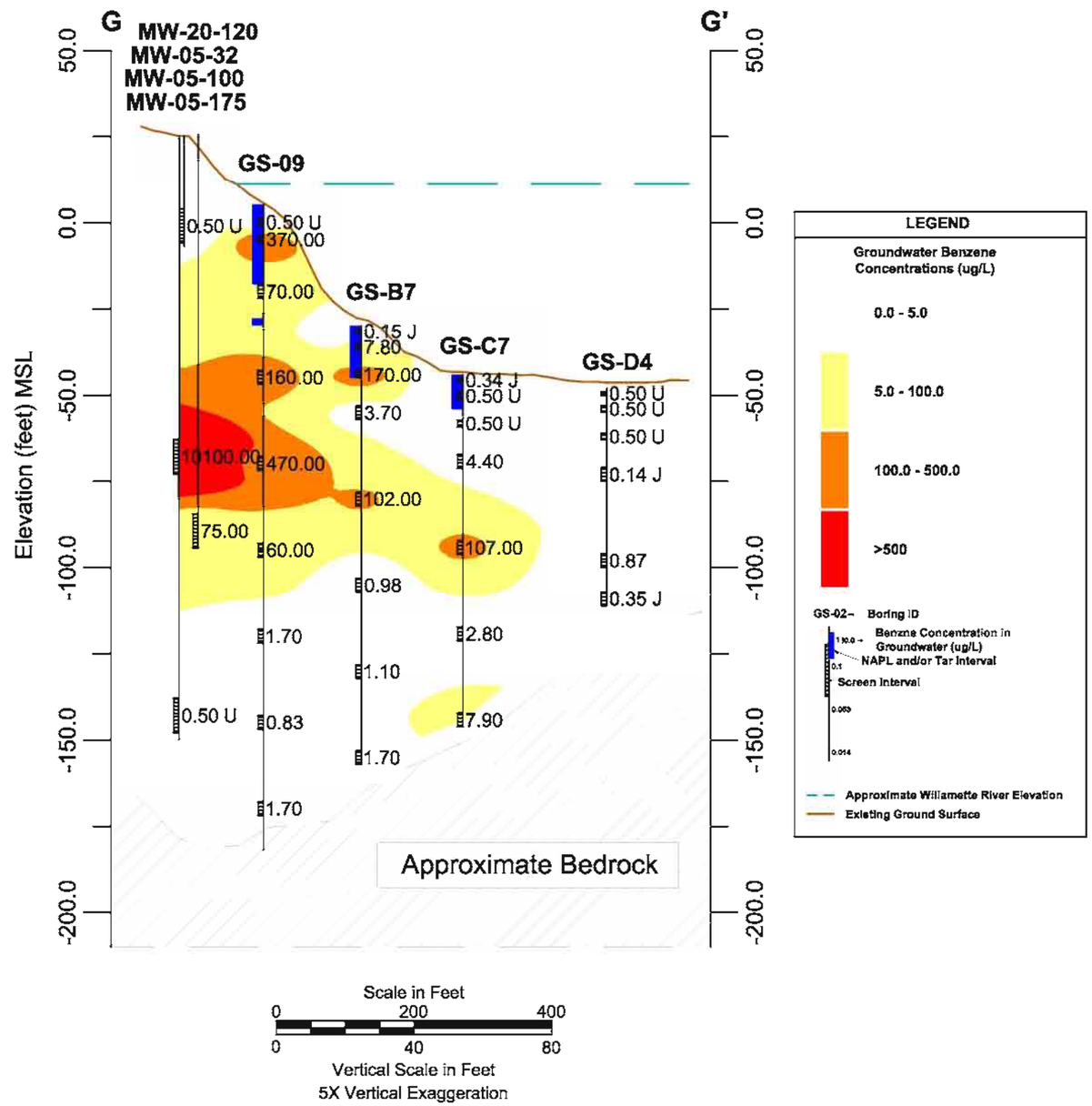
Figure 1.10a
Subsurface Profile G-G'
Free Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:45pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XSG

ANCHOR ENVIRONMENTAL, L.L.C.

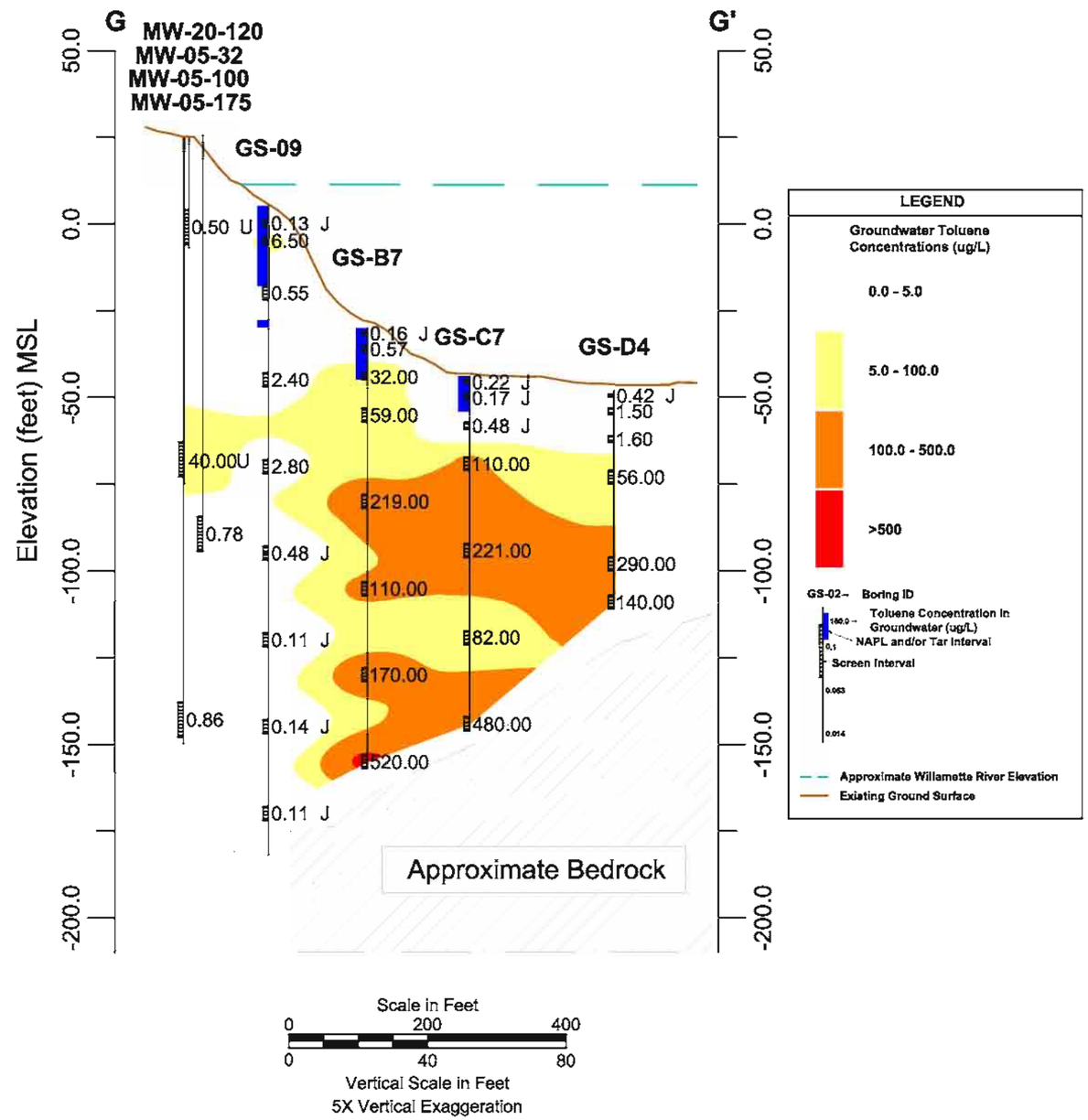
Figure 1.10b
Subsurface Profile G-G'
Total Cyanide Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:49pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg G

ANCHOR ENVIRONMENTAL, L.L.C.

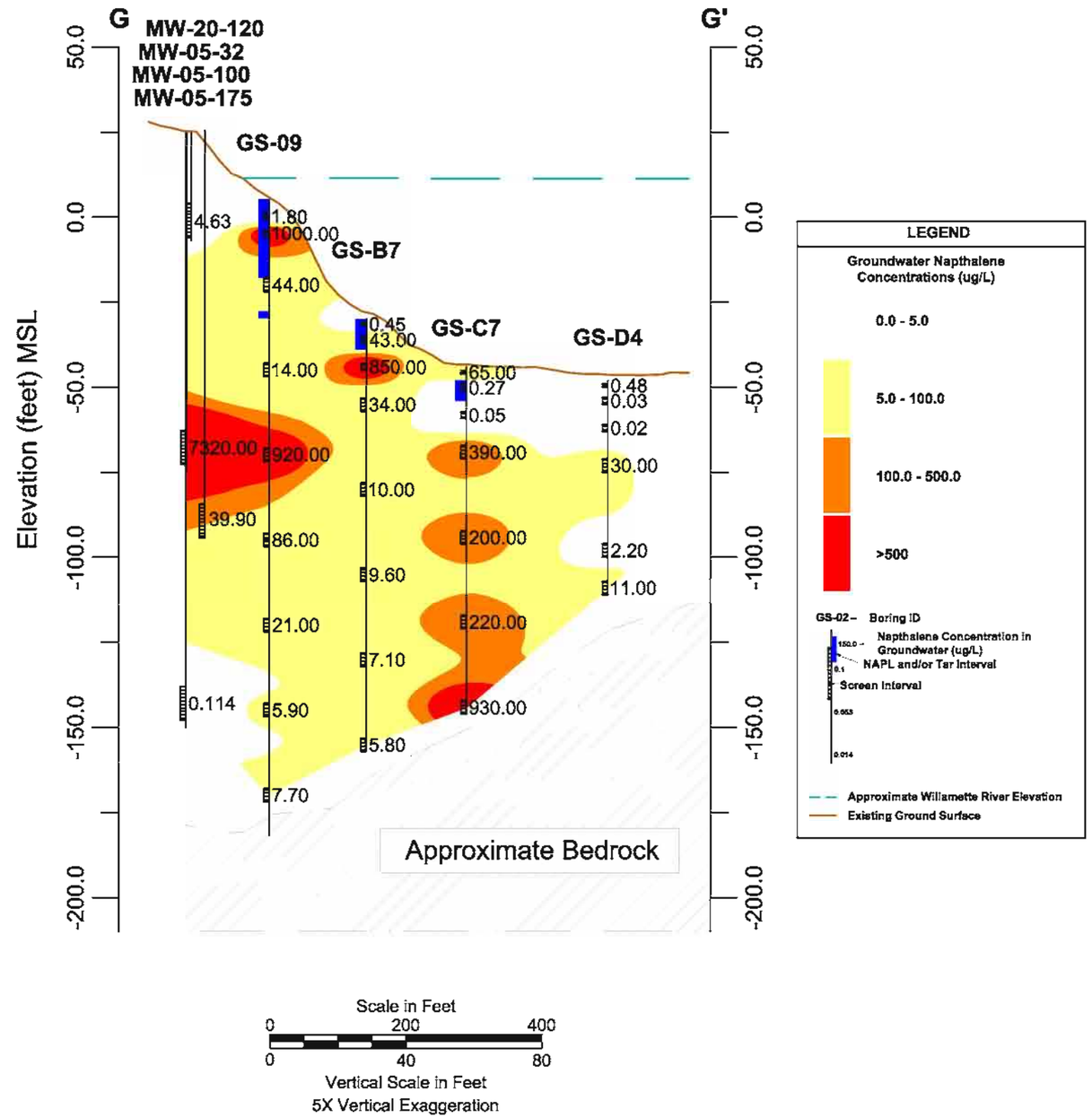
Figure 1.10c
Subsurface Profile G-G'
Benzene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:53pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XSG

ANCHOR ENVIRONMENTAL, L.L.C.

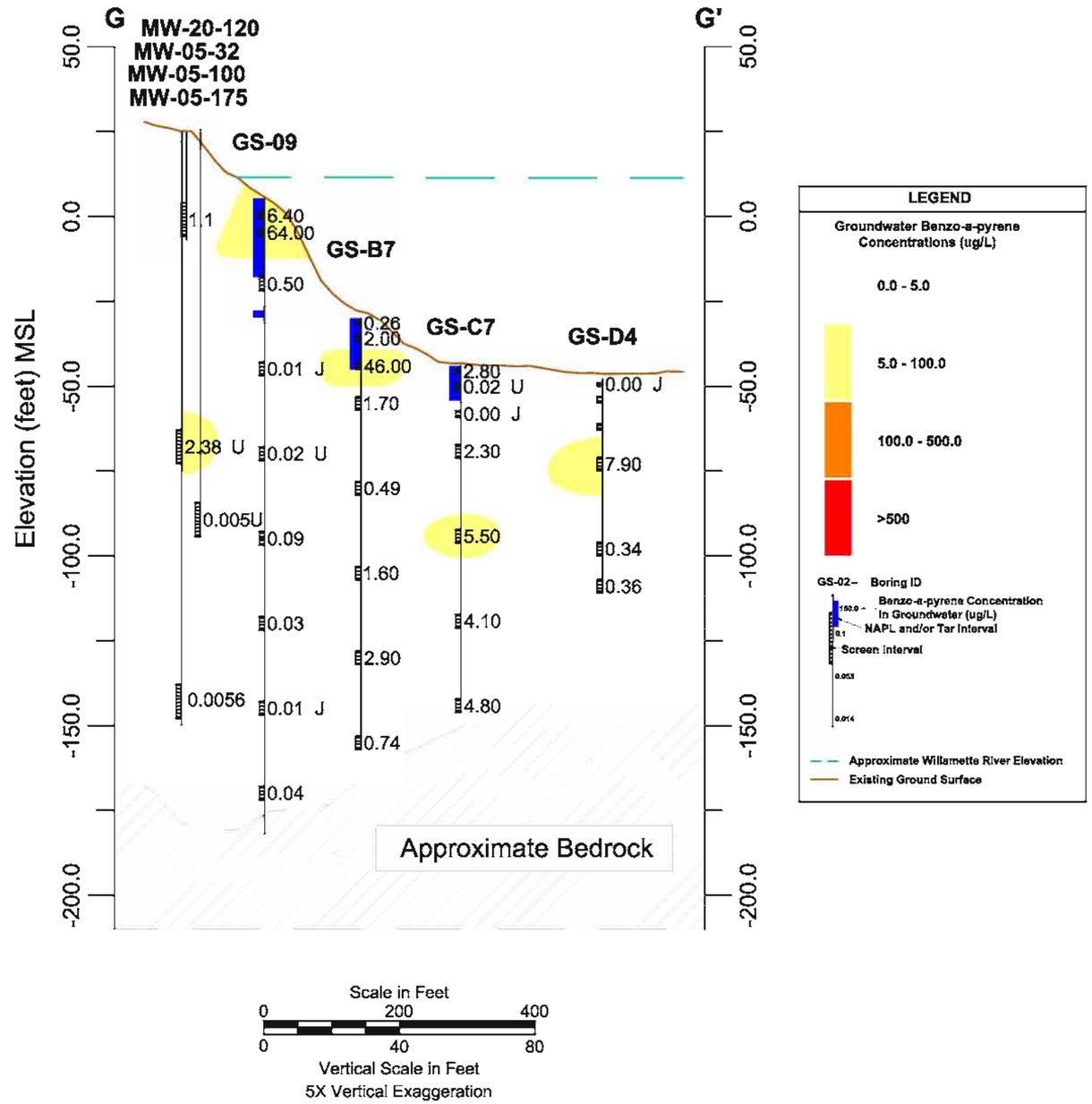
Figure 1.10d
Subsurface Profile G-G'
Toluene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 31, 2008 3:56pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XSG

ANCHOR ENVIRONMENTAL, L.L.C.

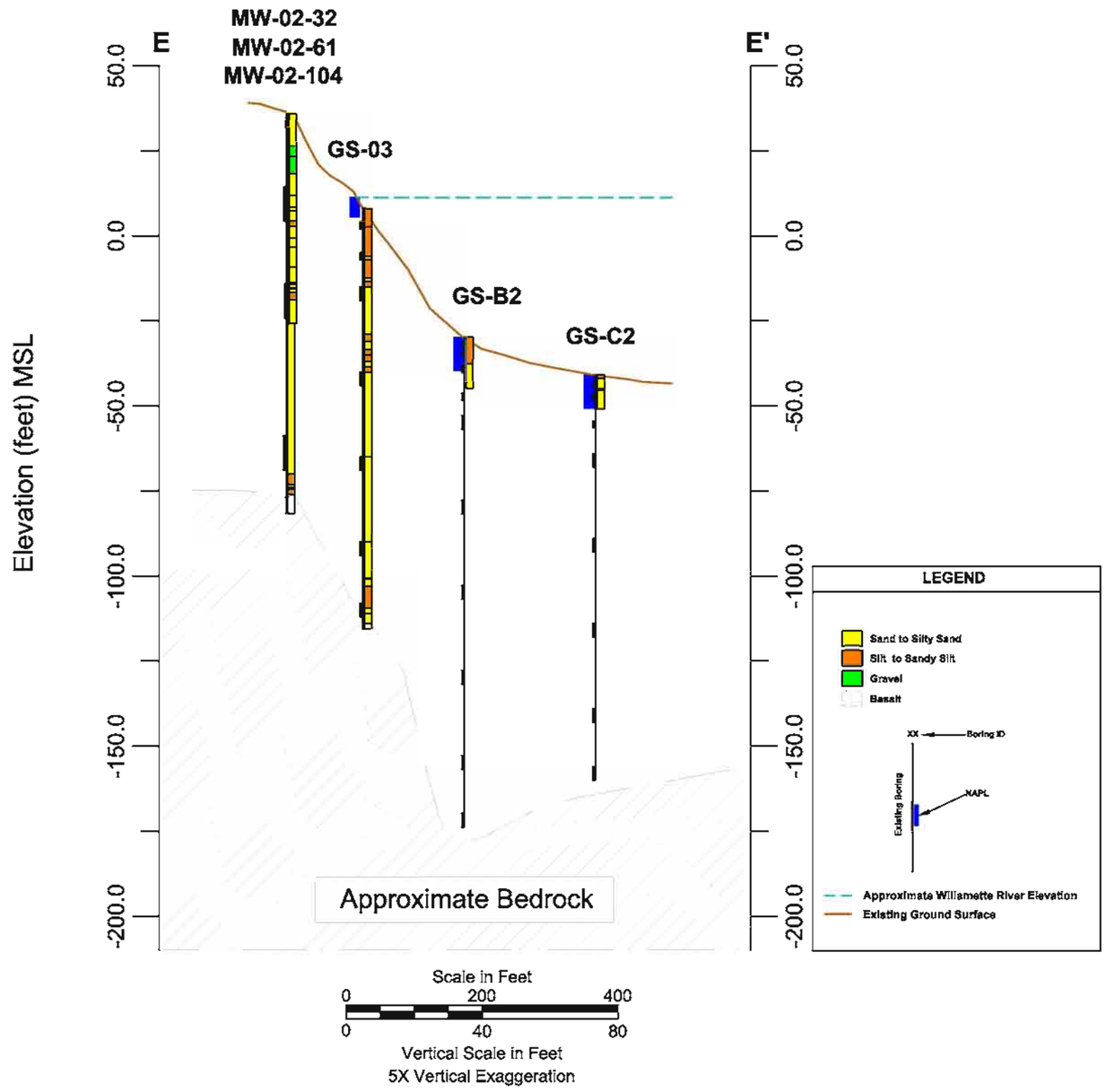
Figure 1.10e
Subsurface Profile G-G'
Napthalene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 28, 2008 8:58pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XSG

ANCHOR ENVIRONMENTAL, L.L.C.

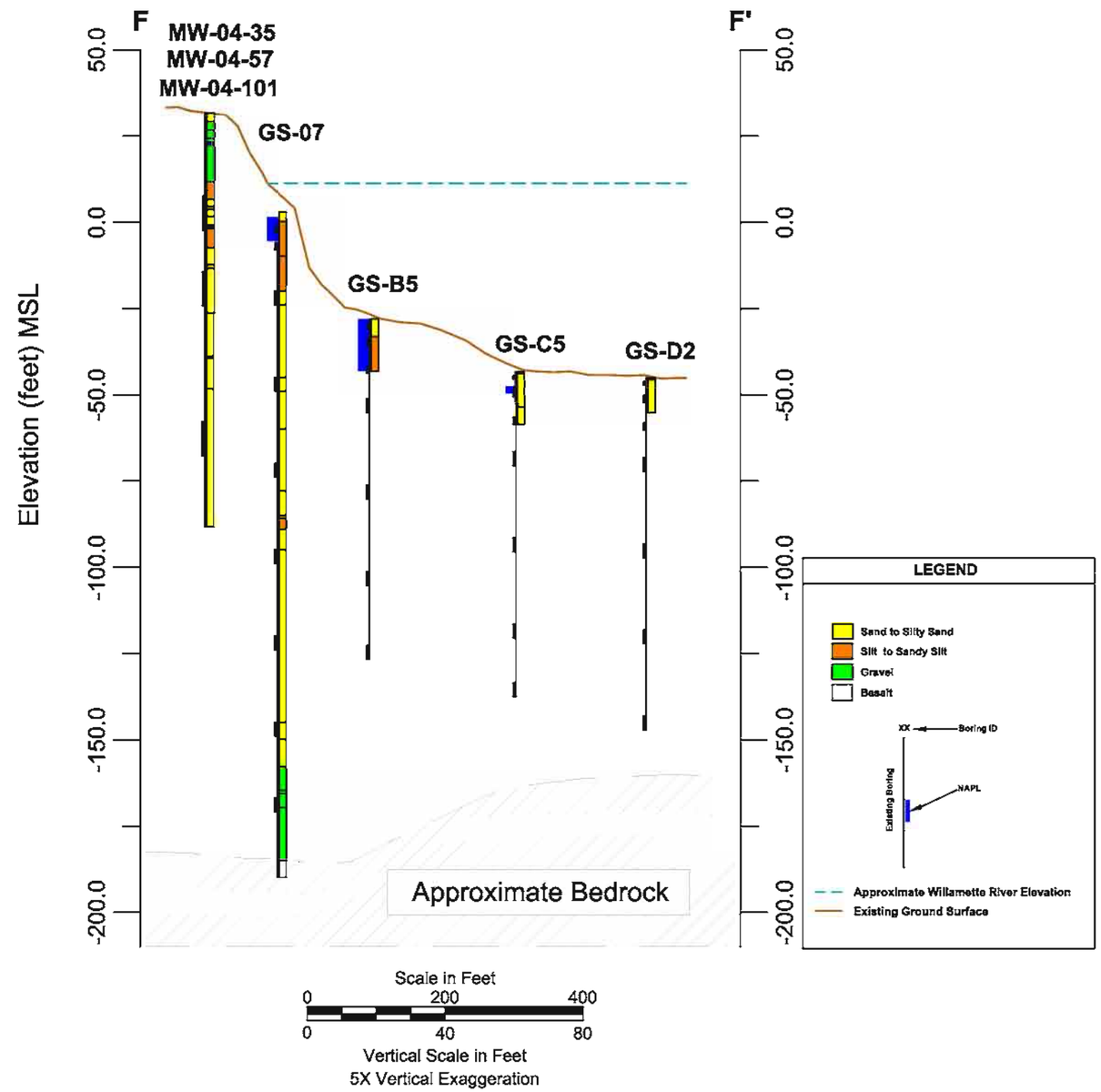
Figure 1.10f
Subsurface Profile G-G'
Benzo(a)pyrene Concentrations in Groundwater
Gasco, Portland, Oregon



Jan 30, 2008 8:21pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg ELith

ANCHOR ENVIRONMENTAL, L.L.C.

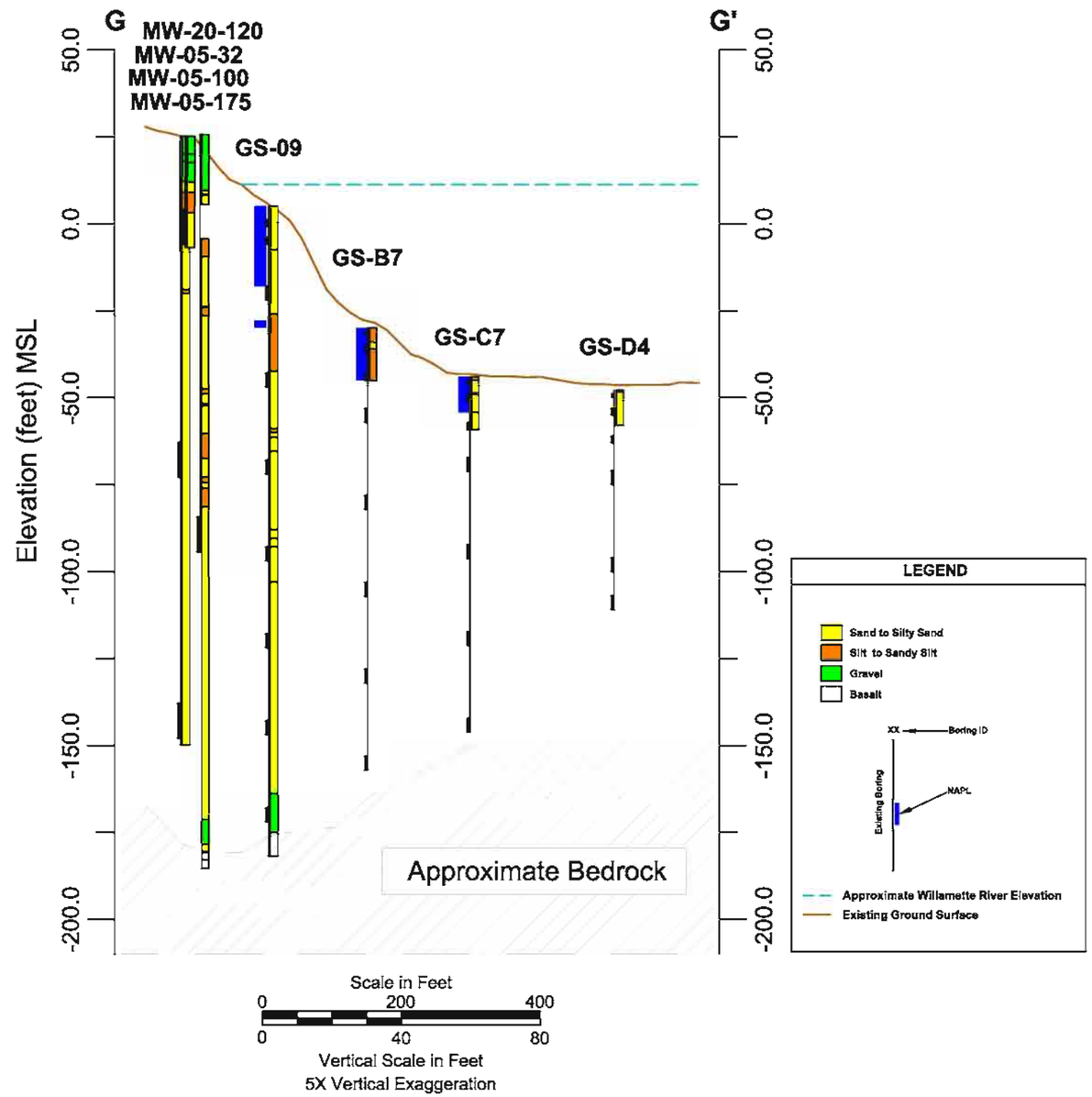
Figure 1.11
Subsurface Profile E-E'
Sediment Lithology
Gasco, Portland, Oregon



Jan 30, 2008 8:23pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg FLith

ANCHOR ENVIRONMENTAL, L.L.C.

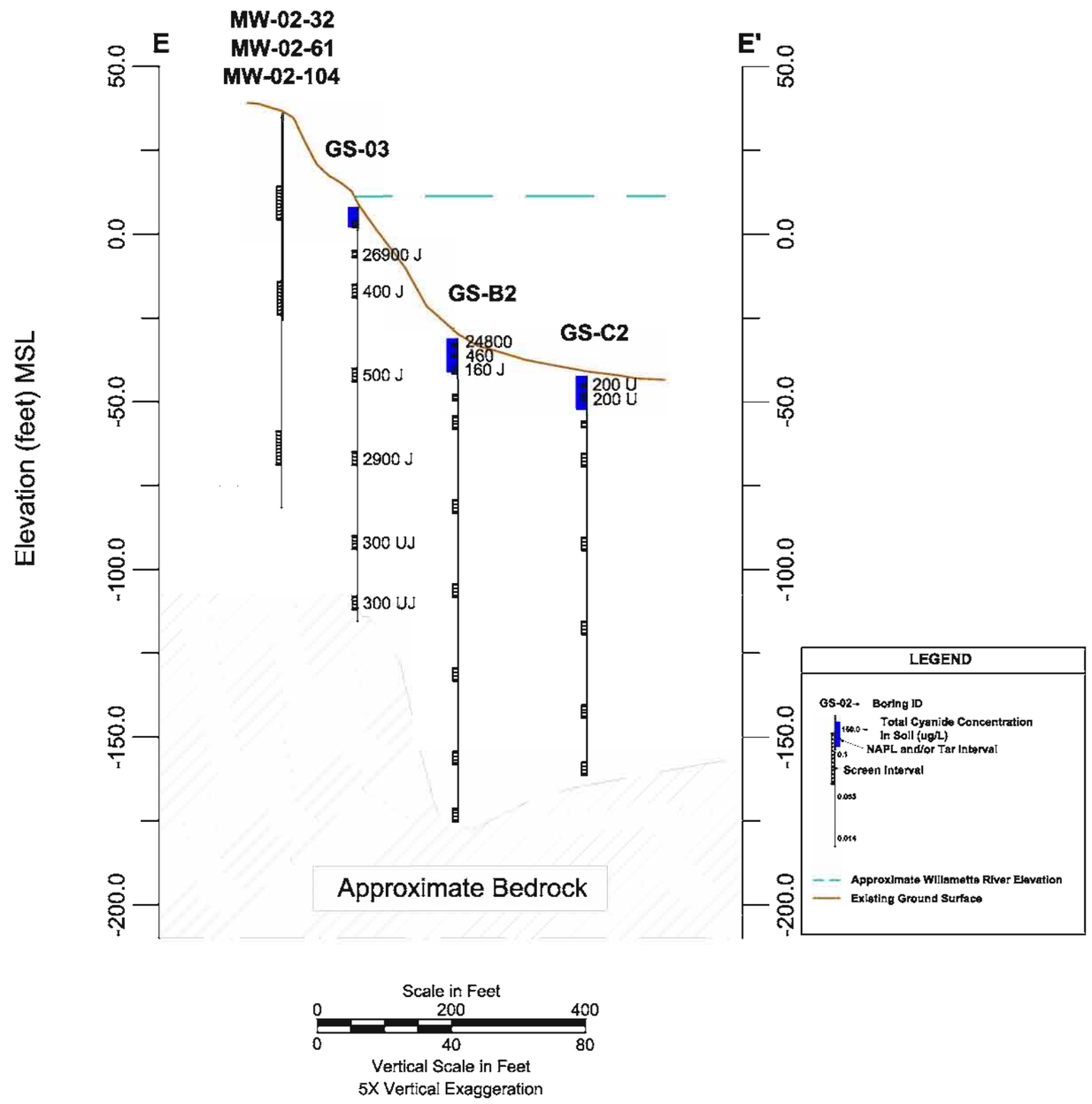
Figure 1.12
Subsurface Profile F-F'
Sediment Lithology
Gasco, Portland, Oregon



Jan 30, 2008 8:24pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-free.dwg GLith

ANCHOR ENVIRONMENTAL, L.L.C.

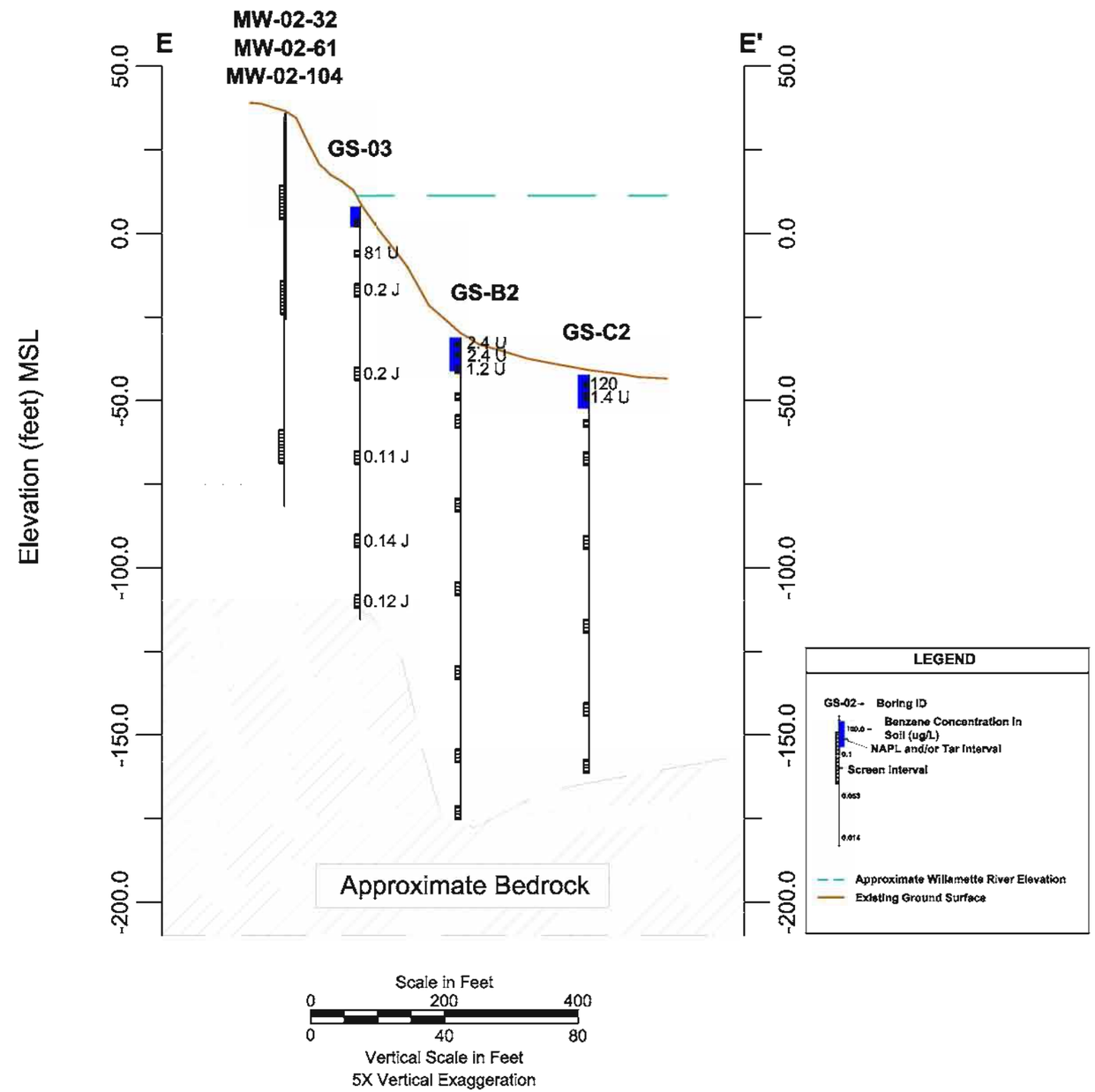
Figure 1.13
Subsurface Profile G-G'
Sediment Lithology
Gasco, Portland, Oregon



Jan 31, 2008 3:16pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XS_SE

ANCHOR ENVIRONMENTAL, L.L.C.

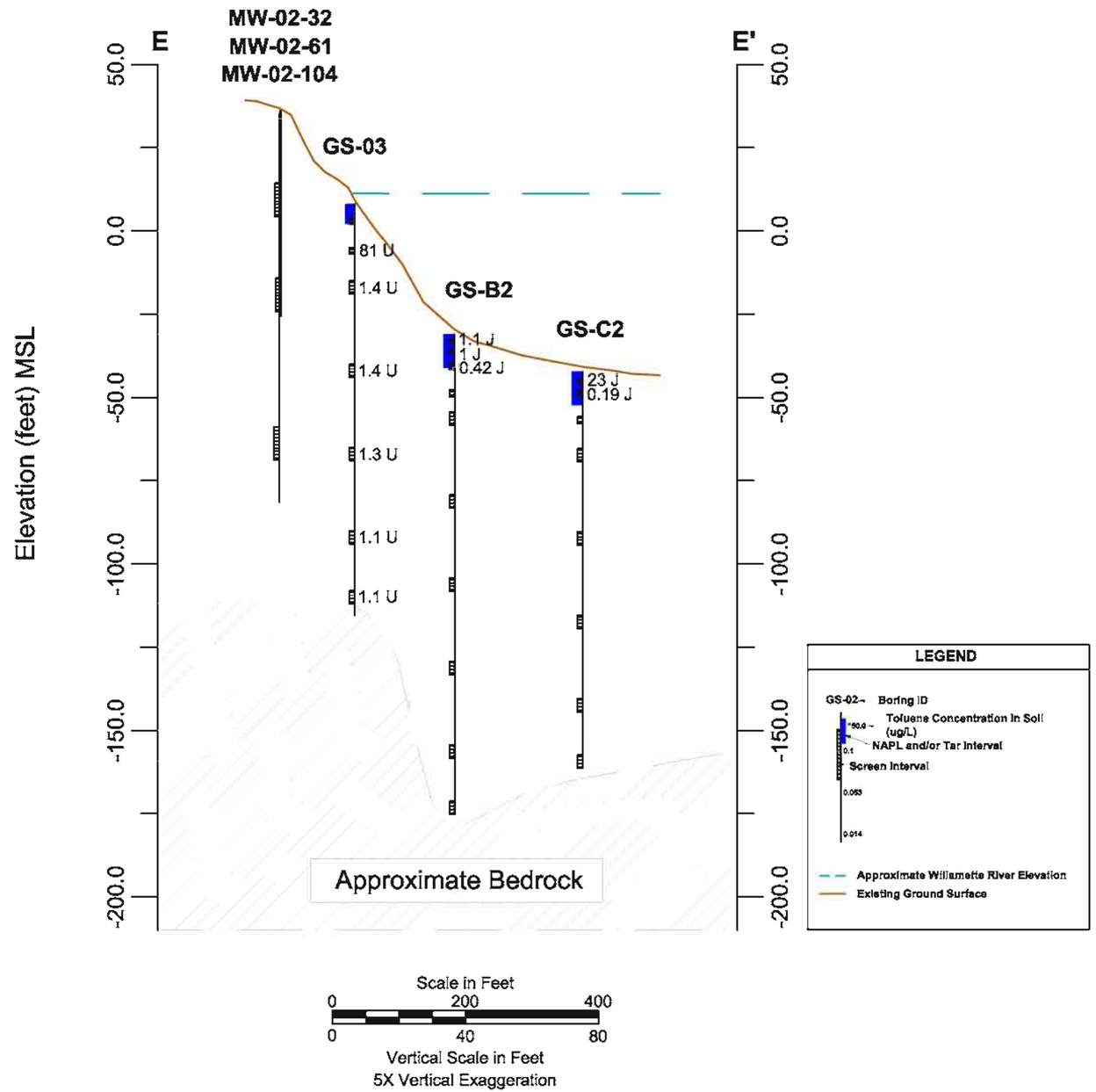
Figure 1.14a
Subsurface Profile E-E'
Total Cyanide Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:24pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg SE

ANCHOR ENVIRONMENTAL, L.L.C.

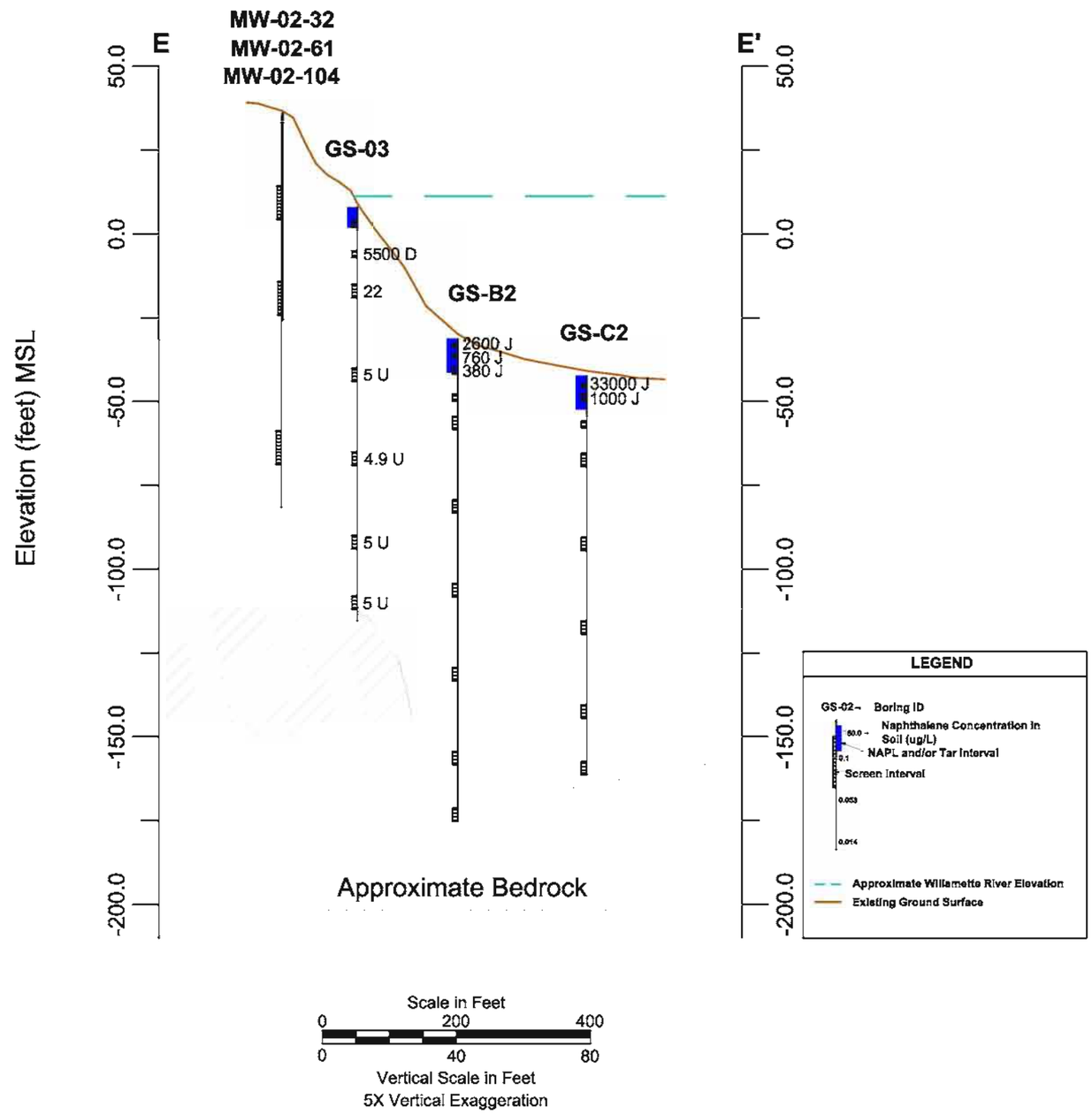
Figure 1.14b
Subsurface Profile E-E'
Benzene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:31pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XS_SE

ANCHOR ENVIRONMENTAL, L.L.C.

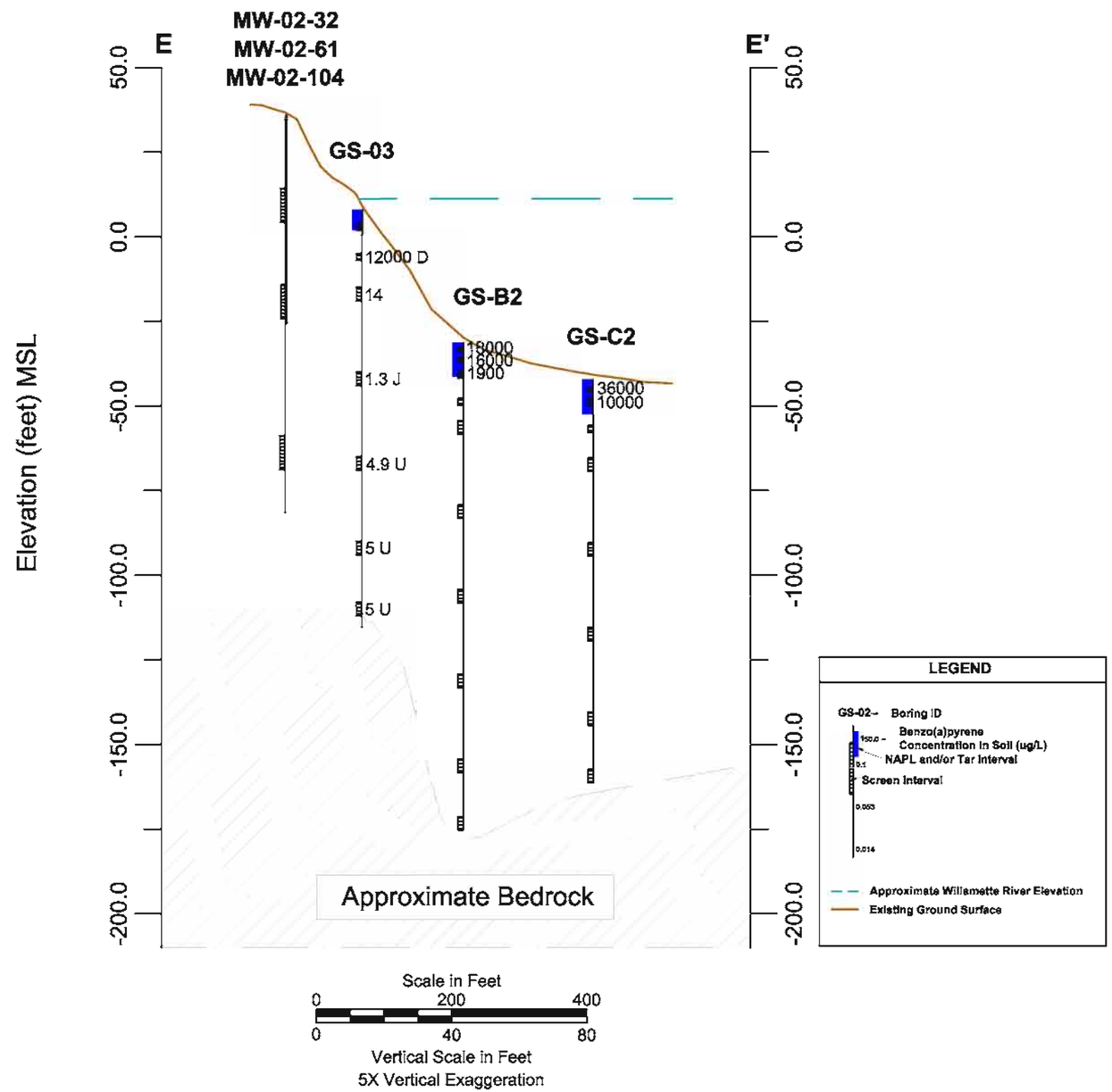
Figure 1.14c
Subsurface Profile E-E'
Toluene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:37pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\naphthalene.dwg XS_SE

ANCHOR ENVIRONMENTAL, L.L.C.

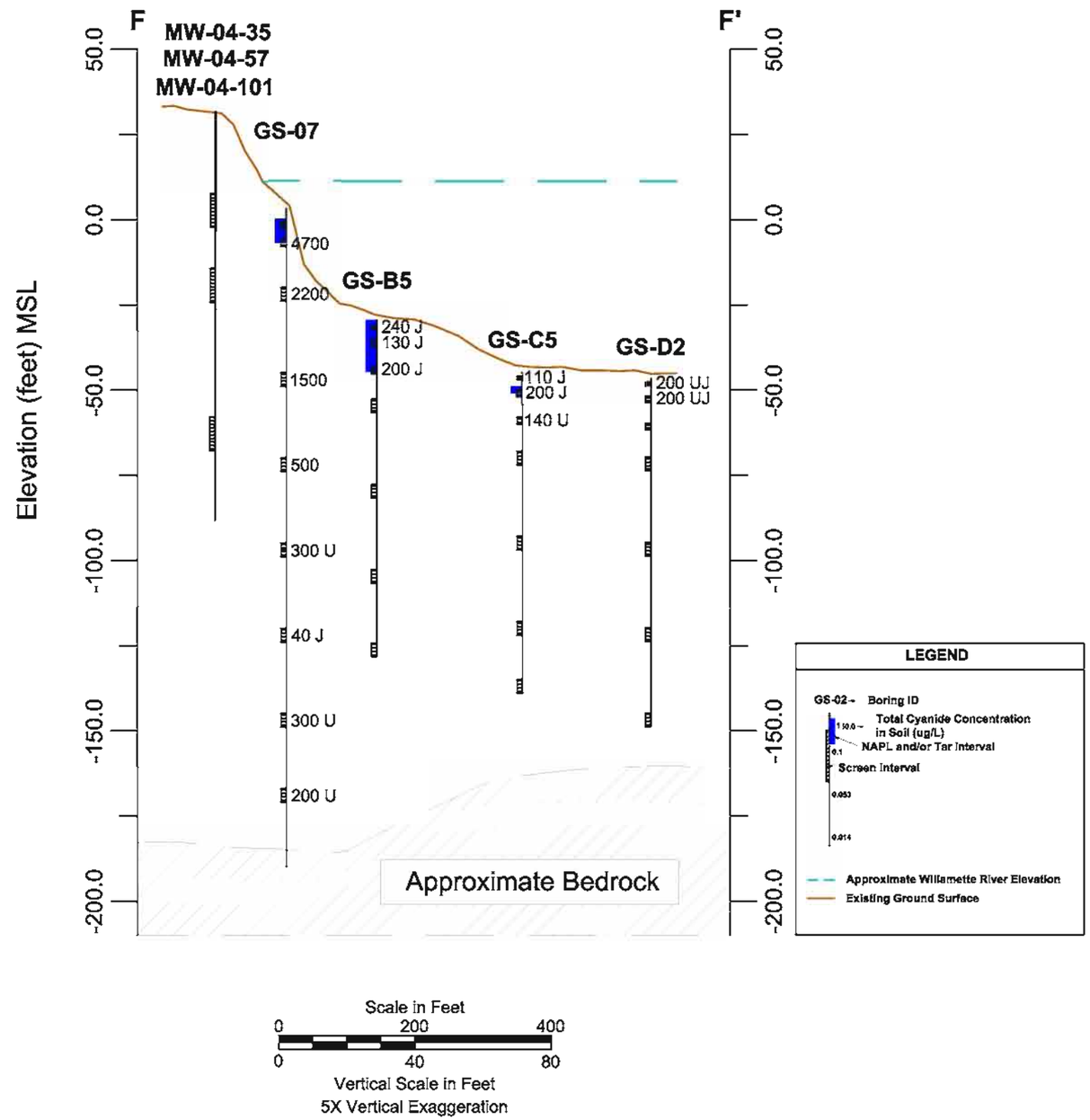
Figure 1.14d
Subsurface Profile E-E'
Napthalene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 4:01pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XS_SE

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.14e
Subsurface Profile E-E'
Benzo(a)pyrene Concentrations in Sediment
Gasco, Portland, Oregon



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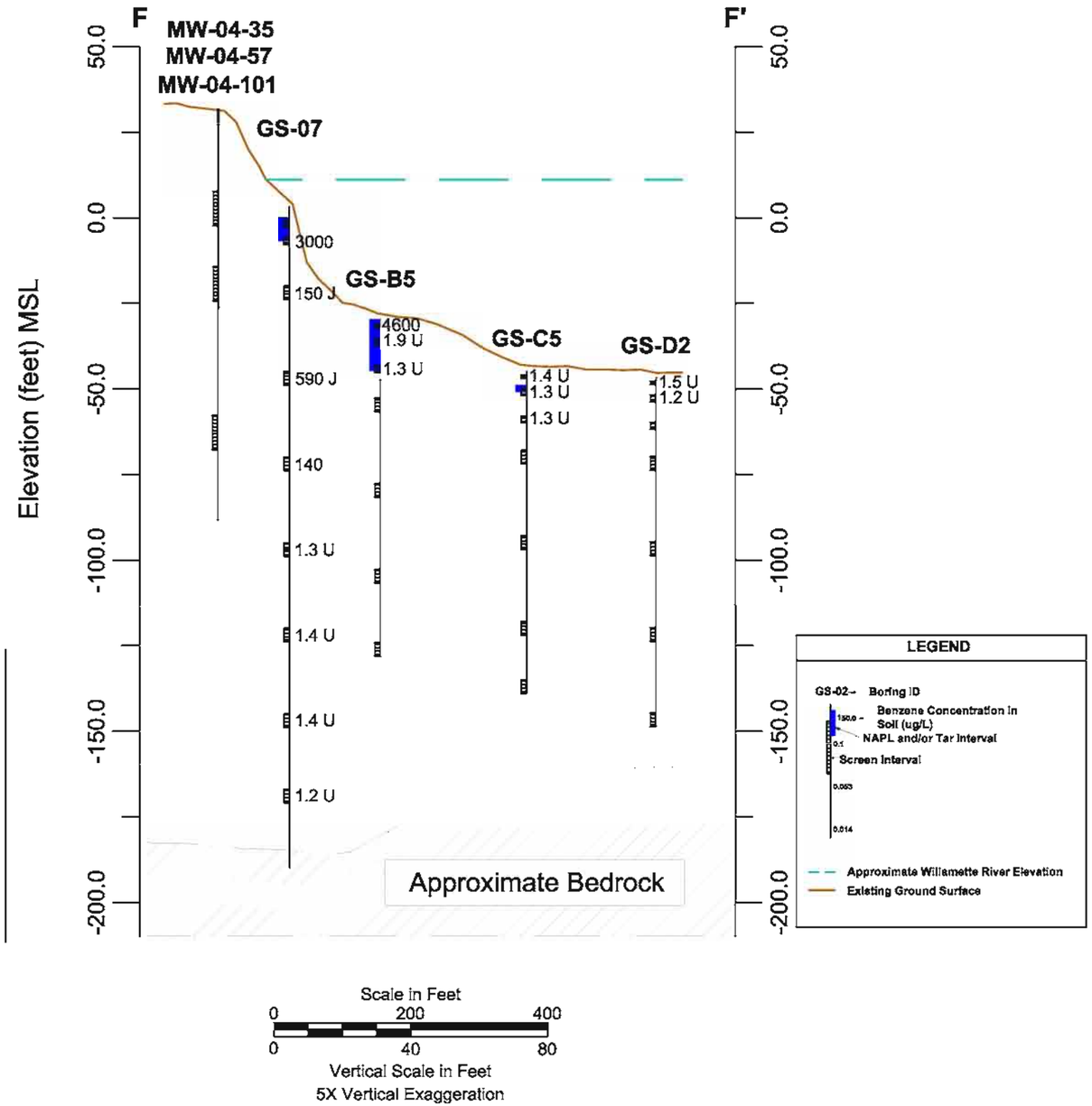
ANCHOR ENVIRONMENTAL, L.L.C.

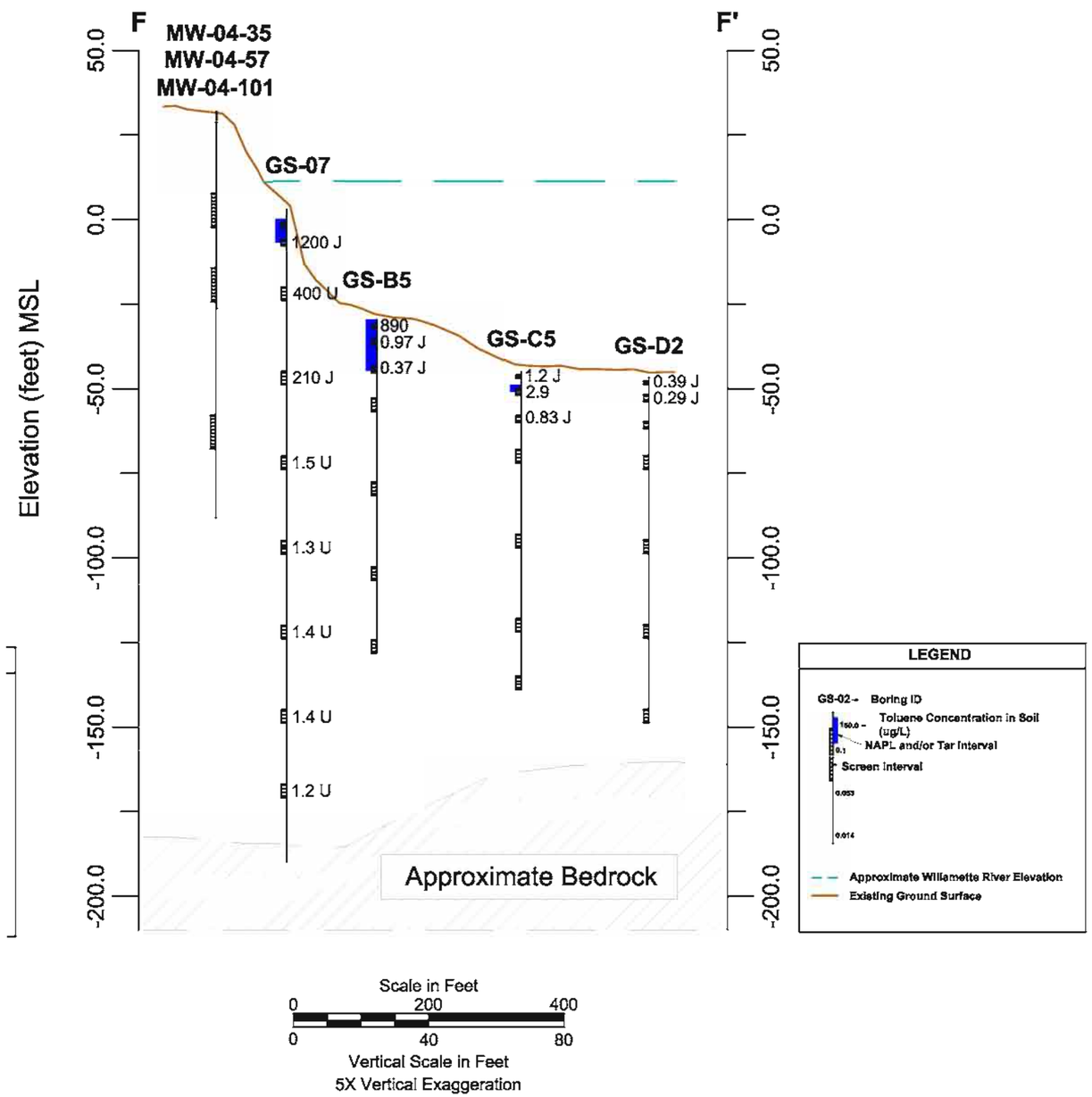
Figure 1.15a
Subsurface Profile F-F'
Total Cyanide Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:25pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg SF

ANCHOR ENVIRONMENTAL, L.L.C.

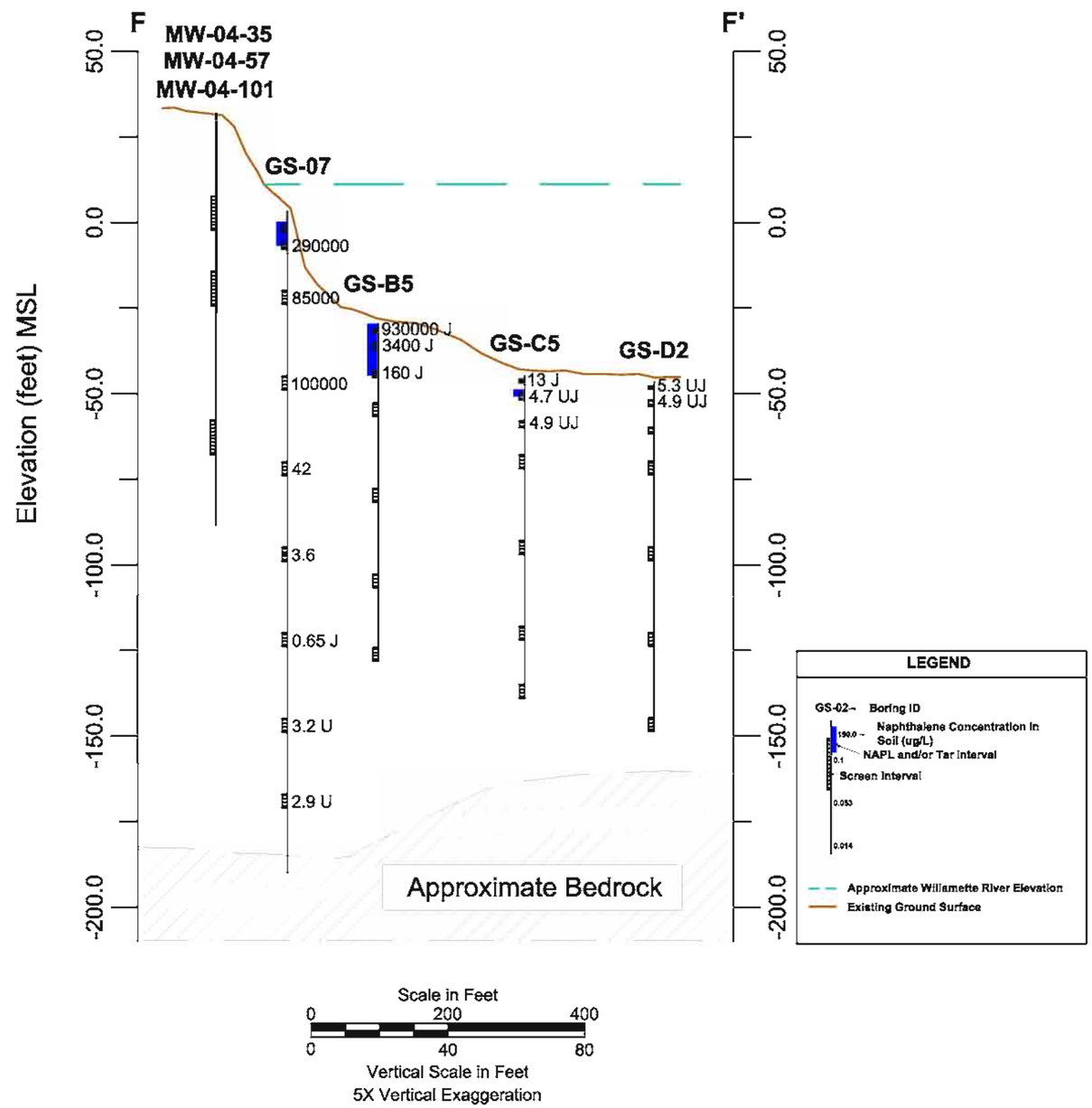
Figure 1.15b
Subsurface Profile F-F'
Benzene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:32pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XS_SF

ANCHOR ENVIRONMENTAL, L.L.C.

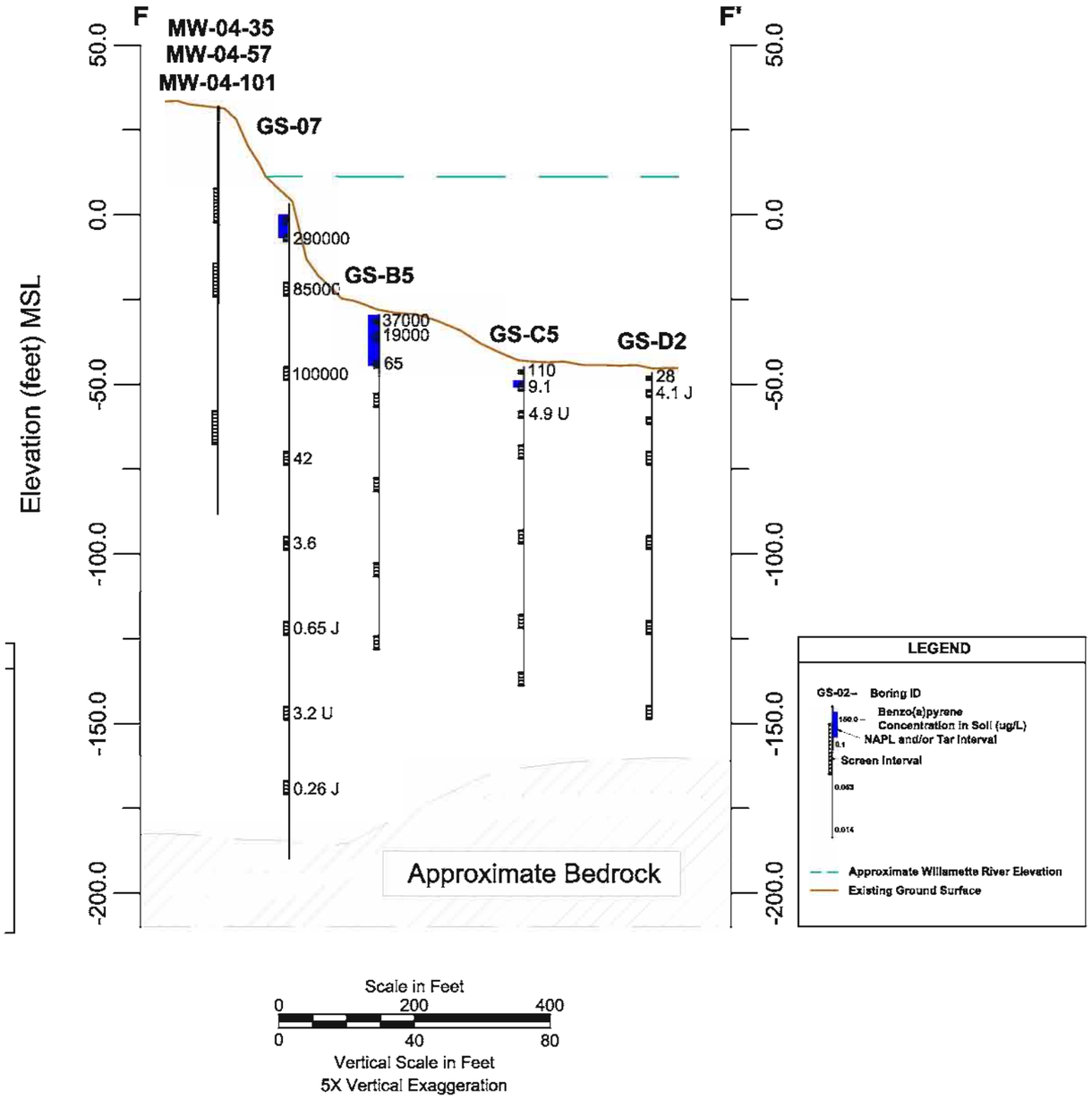
Figure 1.15c
Subsurface Profile F-F'
Toluene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:38pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\napthalene.dwg XS_SF

ANCHOR ENVIRONMENTAL, L.L.C.

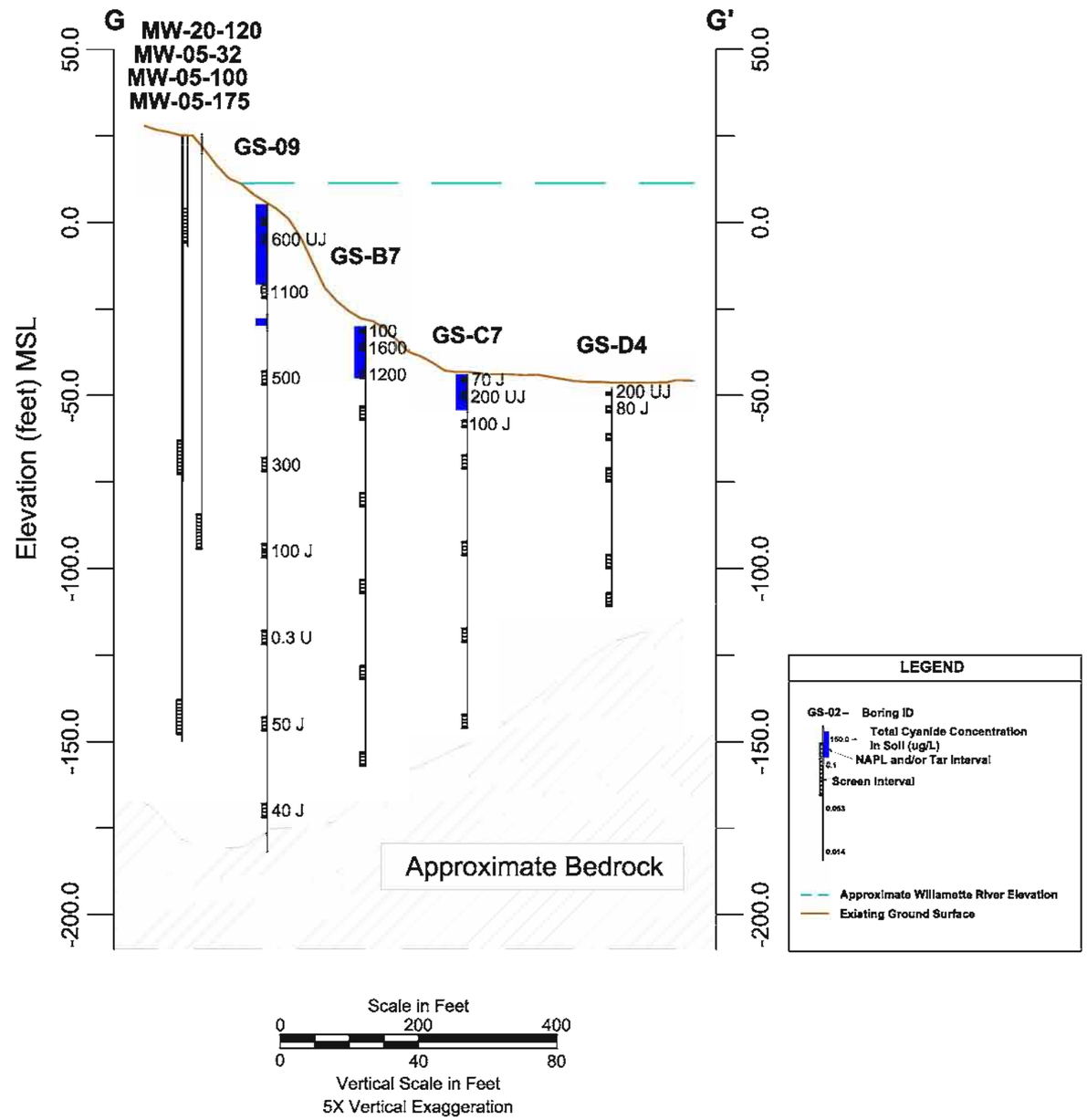
Figure 1.15d
Subsurface Profile F-F'
Napthalene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 4:01pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XS_SF

ANCHOR ENVIRONMENTAL, L.L.C.

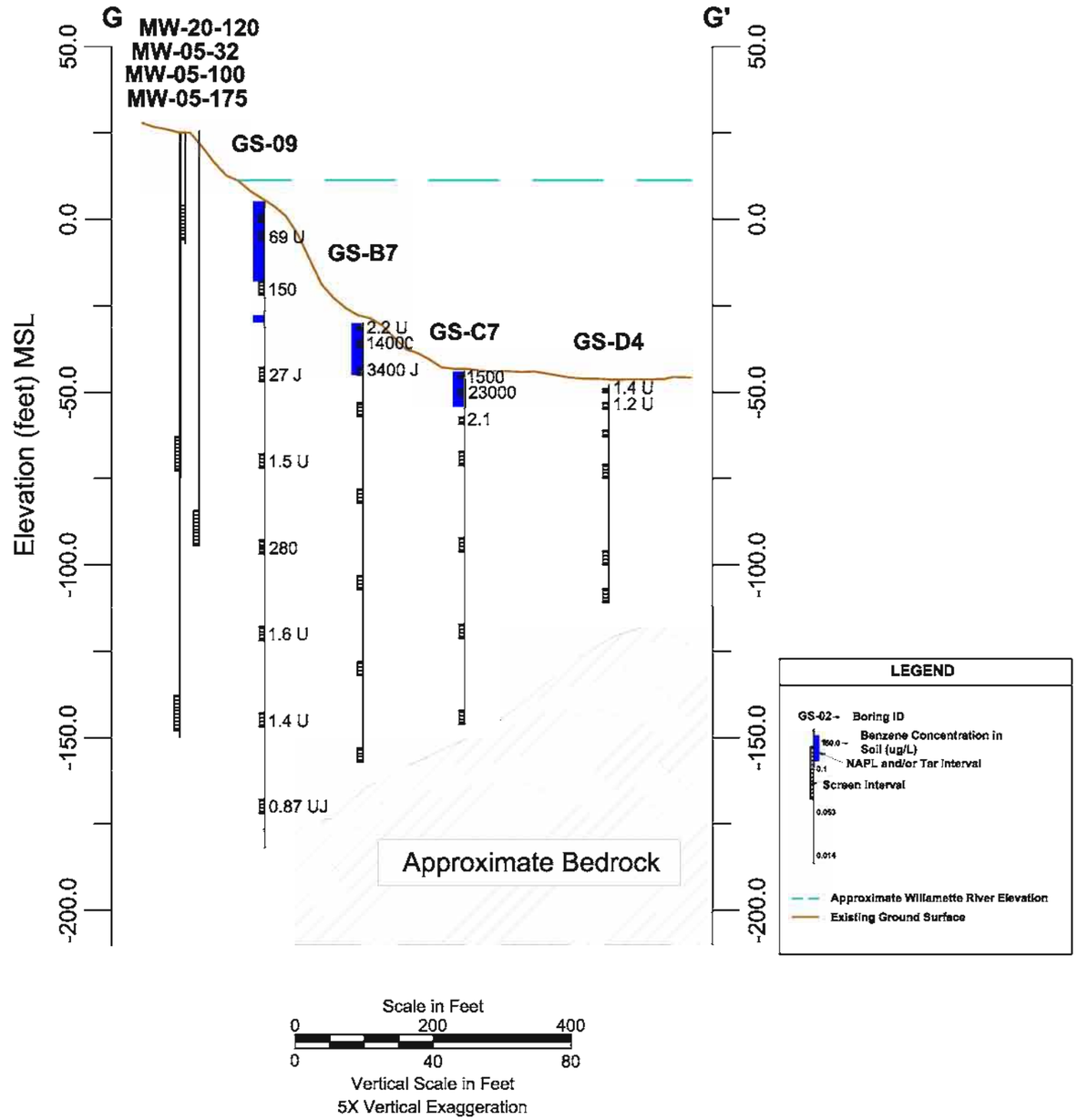
Figure 1.15e
Subsurface Profile F-F'
Benzo(a)pyrene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:17pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\cyanide-total.dwg XS_SG

ANCHOR ENVIRONMENTAL, L.L.C.

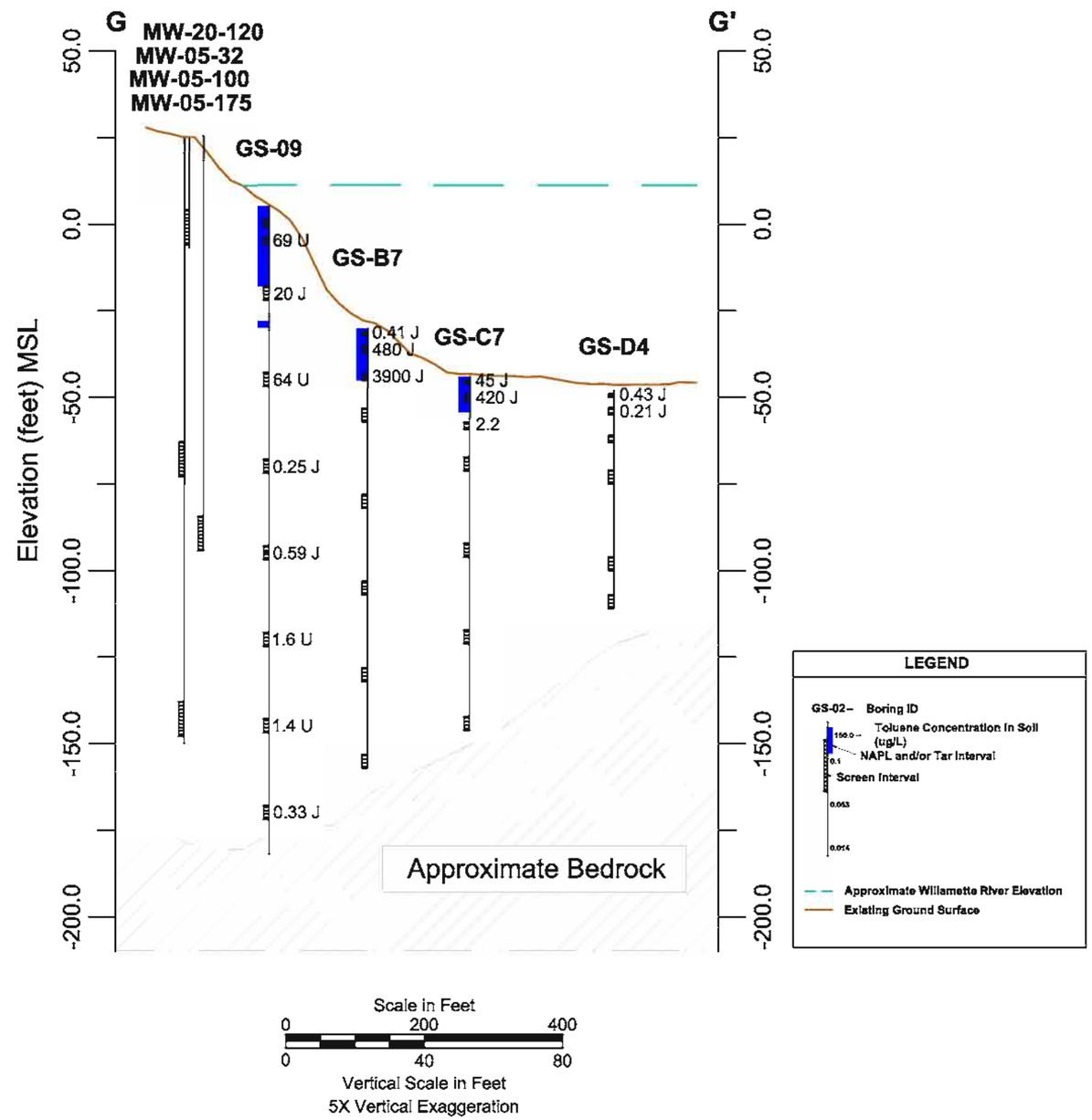
Figure 1.16a
Subsurface Profile G-G'
Total Cyanide Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:25pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzene.dwg SG

ANCHOR ENVIRONMENTAL, L.L.C.

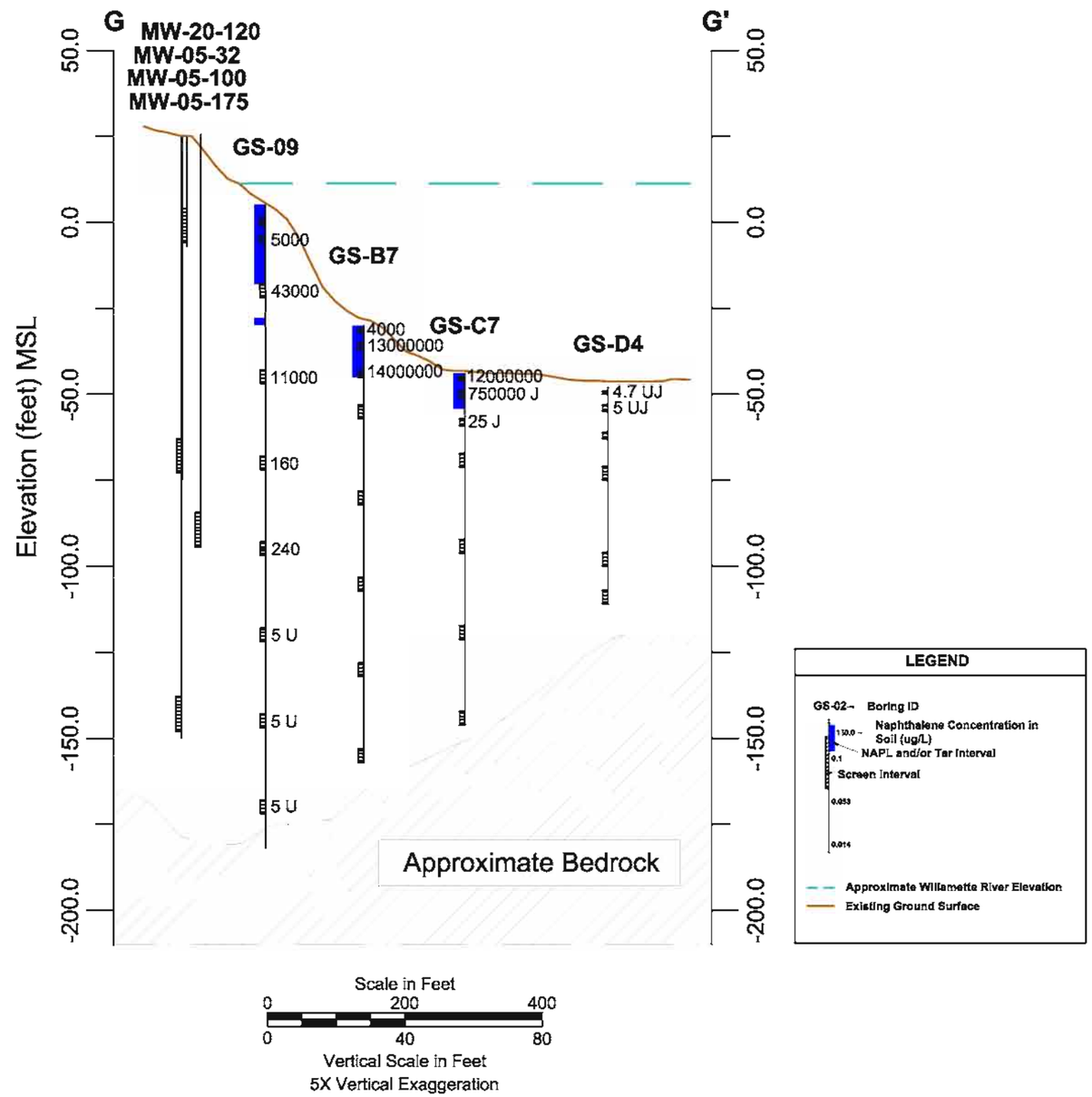
Figure 1.16b
Subsurface Profile G-G'
Benzene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:32pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\toluene.dwg XS_SG

ANCHOR ENVIRONMENTAL, L.L.C.

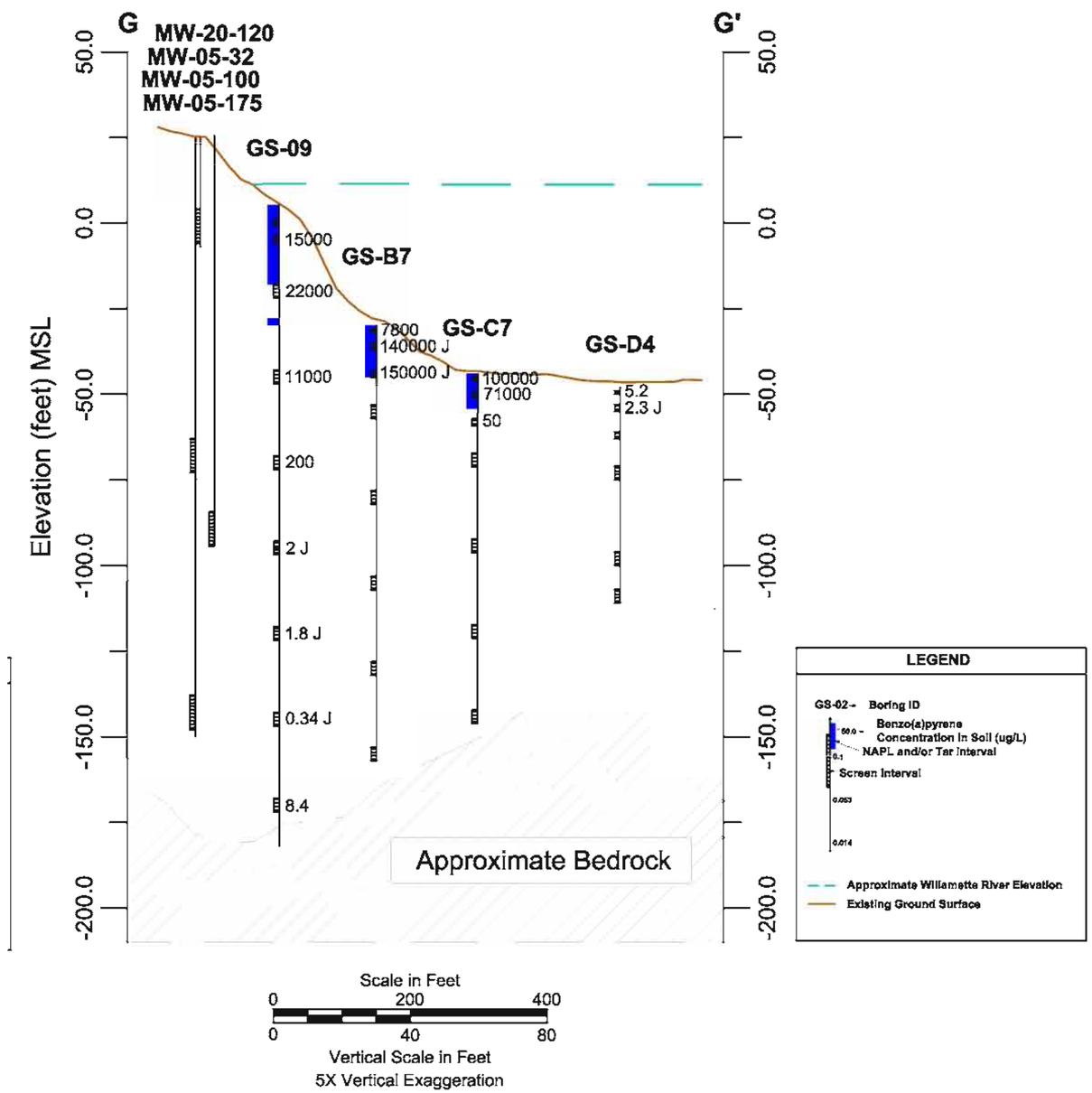
Figure 1.16c
Subsurface Profile G-G'
Toluene Concentrations in Sediment
Gasco, Portland, Oregon



Jan 31, 2008 3:39pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\naphthalene.dwg XS_SG

ANCHOR ENVIRONMENTAL, L.L.C.

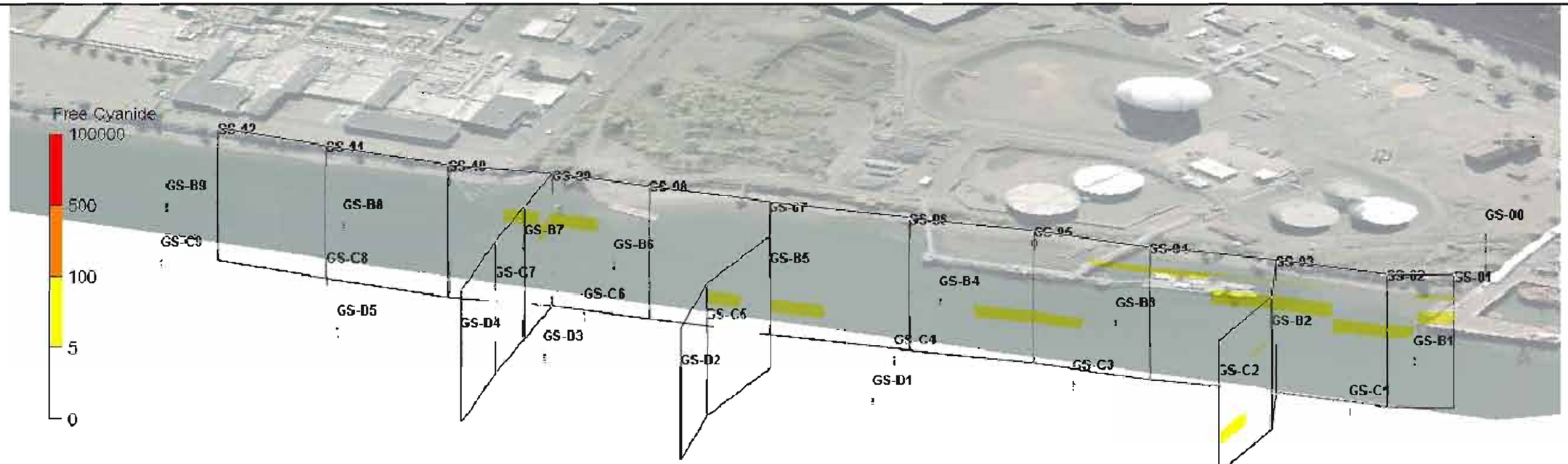
Figure 1.16d
Subsurface Profile G-G'
Napthalene Concentrations in Sediment
Gasco, Portland, Oregon



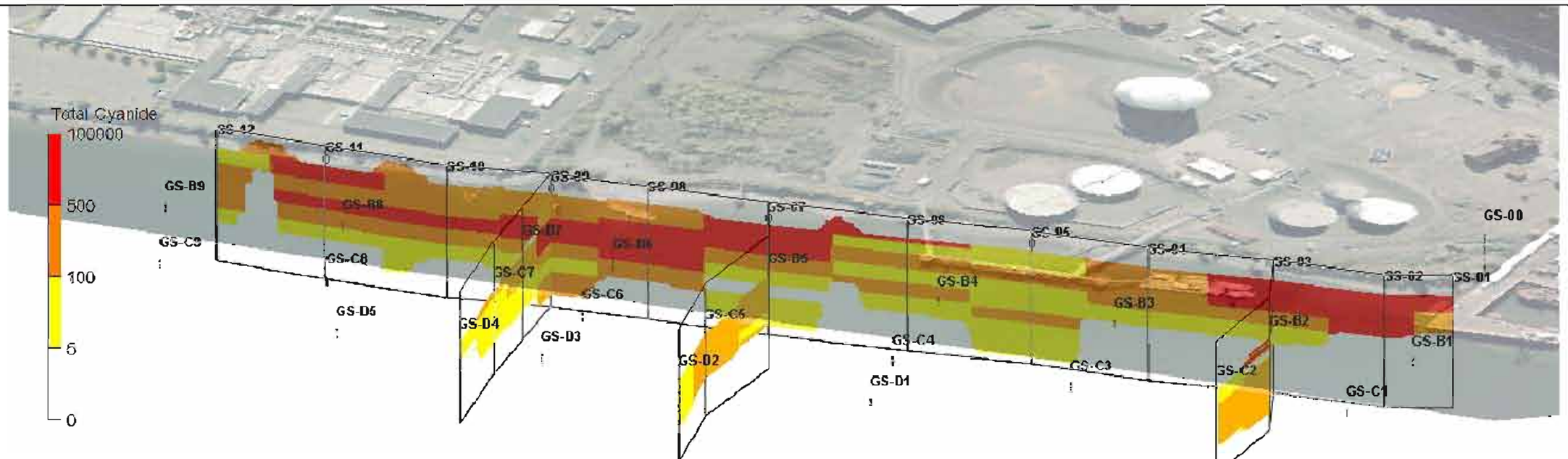
Jan 31, 2008 4:00pm jpelc C:\Documents and Settings\jpelc\Desktop\moveback\Gasco\Phase2\CAD\benzo-a-pyrene.dwg XS_SG

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.16e
Subsurface Profile G-G'
Benzo(a)pyrene Concentrations in Sediment
Gasco, Portland, Oregon



Free Cyanide (ug/L) in Groundwater

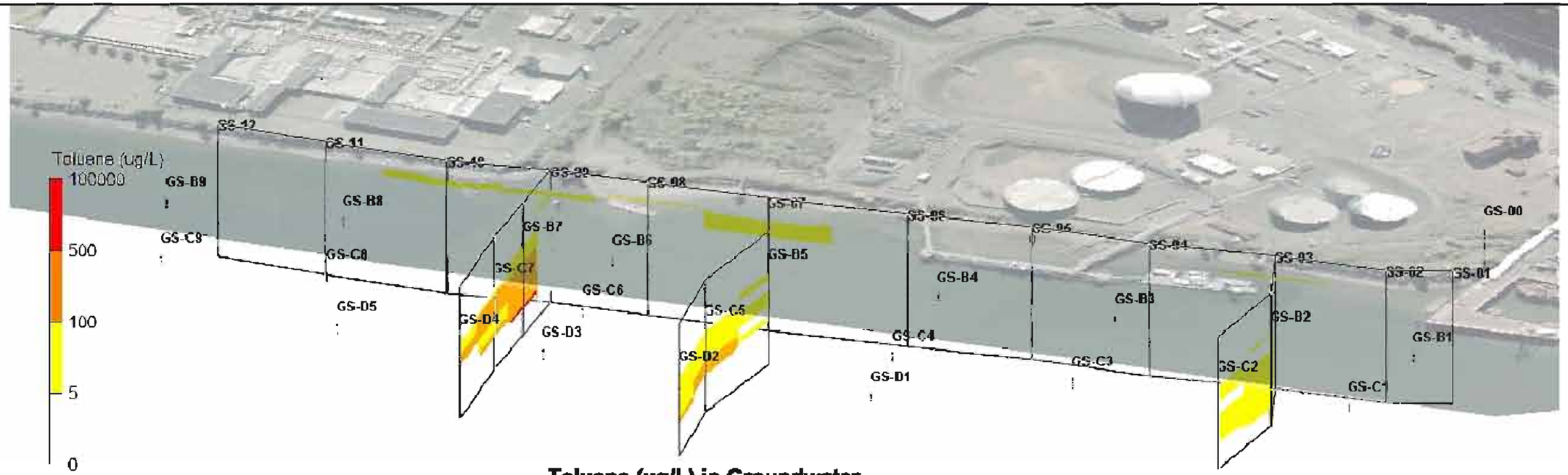


Total Cyanide (ug/L) in Groundwater

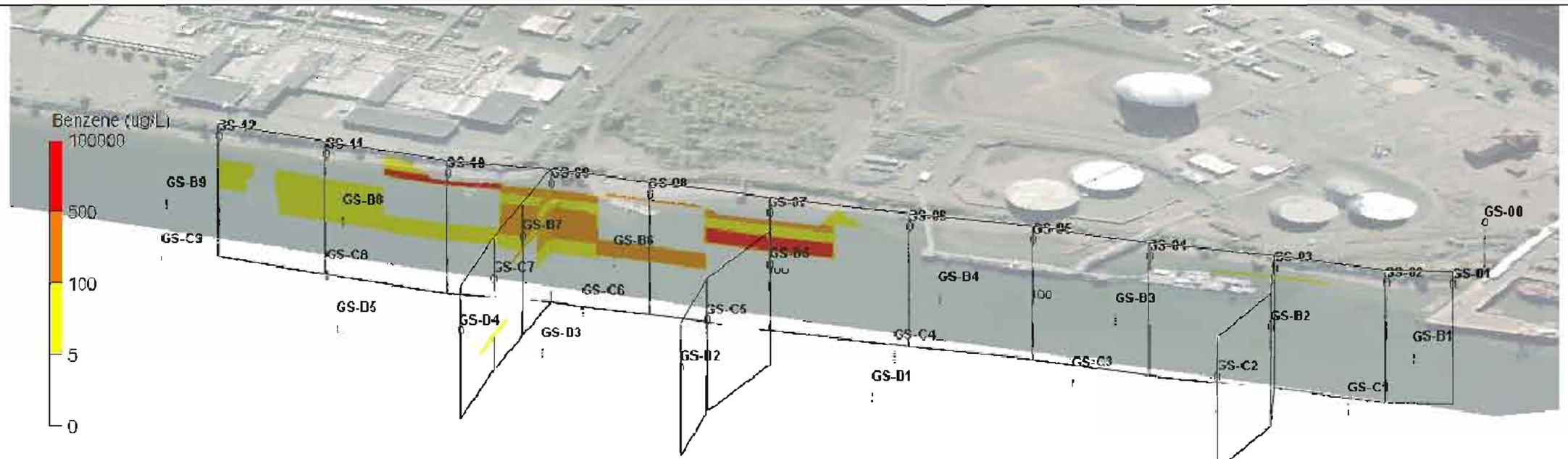
Note: Locations are approximate and are for visualization purposes only.

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.17
Free and Total Cyanide in Groundwater
3D Visualization Model
Gasco, Portland, Oregon



Toluene (ug/L) in Groundwater



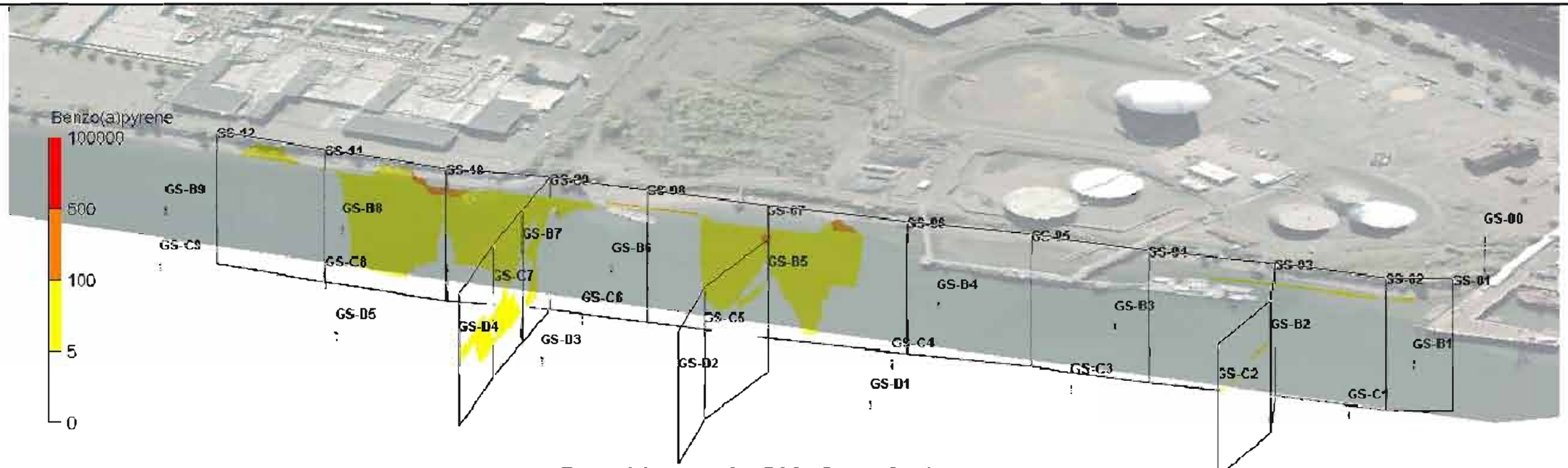
Benzene (ug/L) in Groundwater

Note: Locations are approximate and are for visualization purposes only.

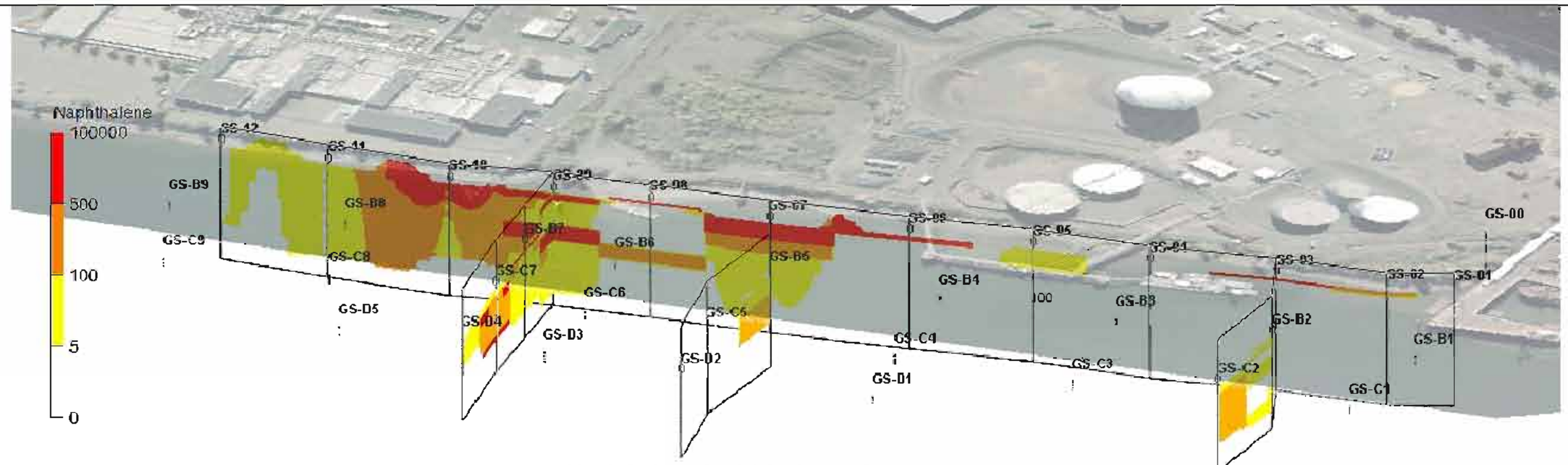
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1.18
Benzene and Toluene in Groundwater
3D Visualization Model
Gasco, Portland, Oregon

Fri Oct, 2009 12:09am jadc C:\Documents and Settings\jadc\Desktop\movies\ufs\Gasco\Phase2\CAD\3DFence\benzene.dwg 1.18



Benzo(a)pyrene (ug/L) in Groundwater

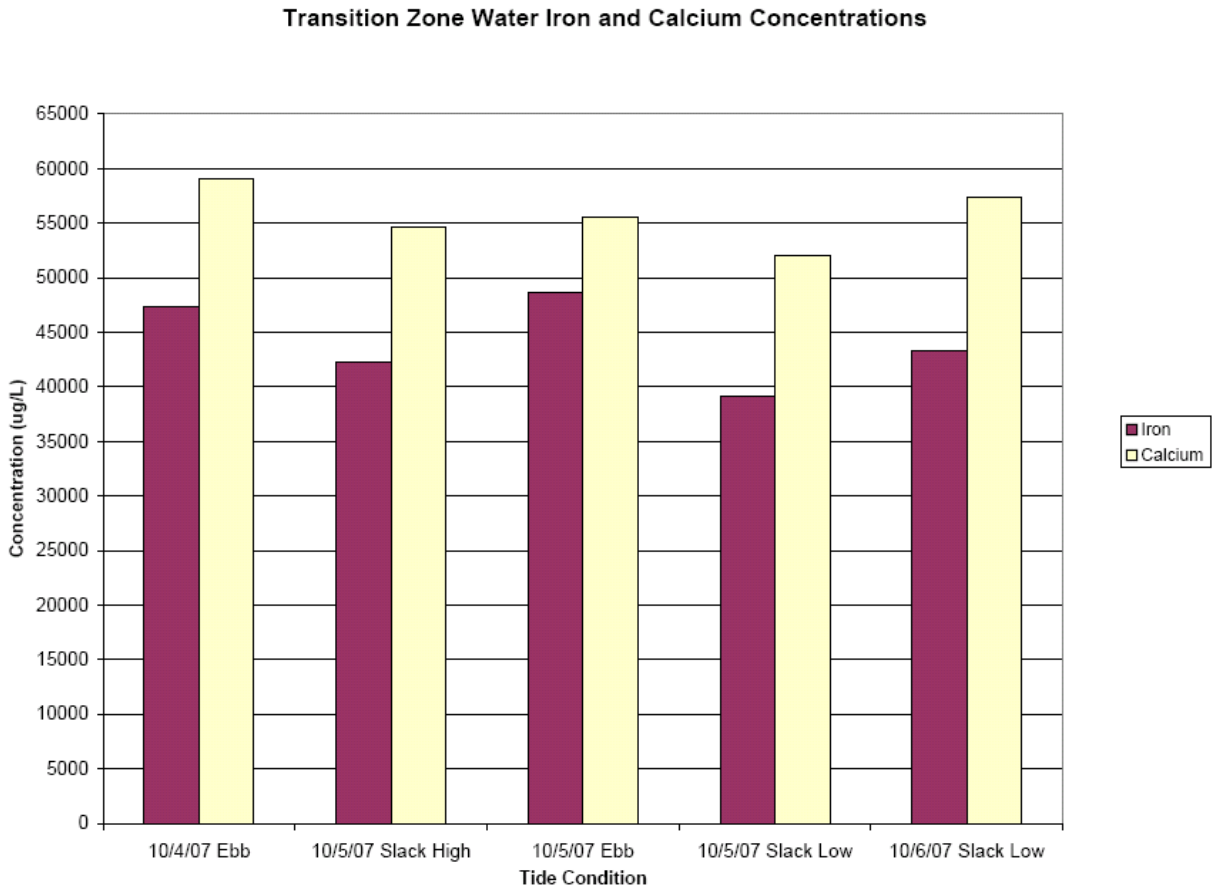


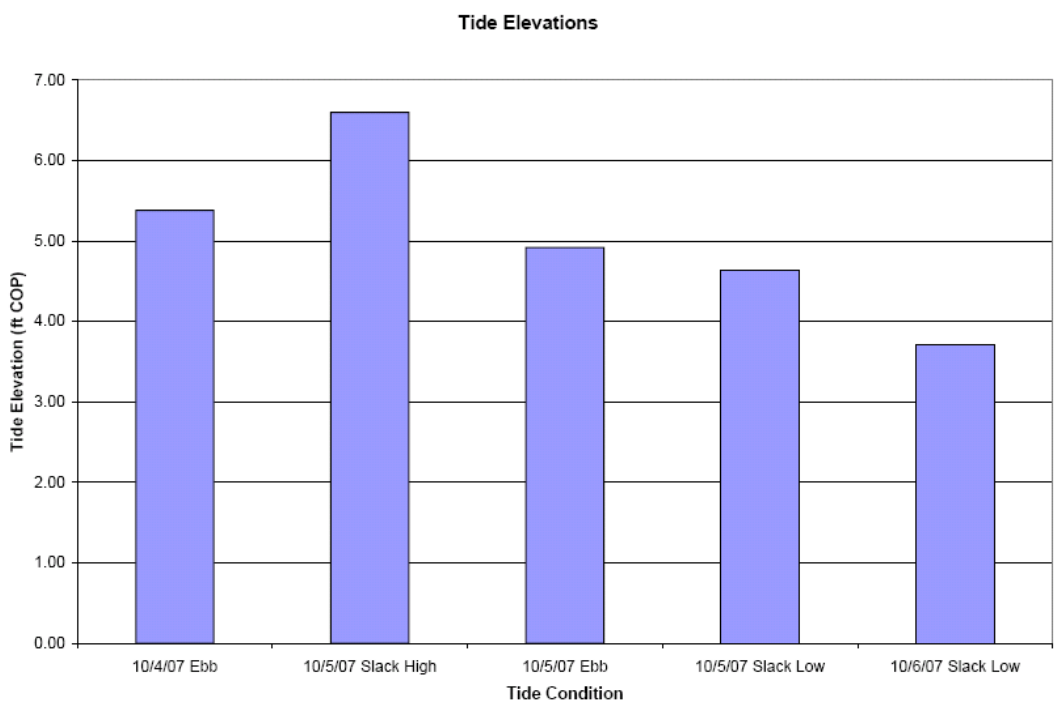
Naphthalene (ug/L) in Groundwater

Note: Locations are approximate and are for visualization purposes only.

ANCHOR ENVIRONMENTAL, L.L.C.

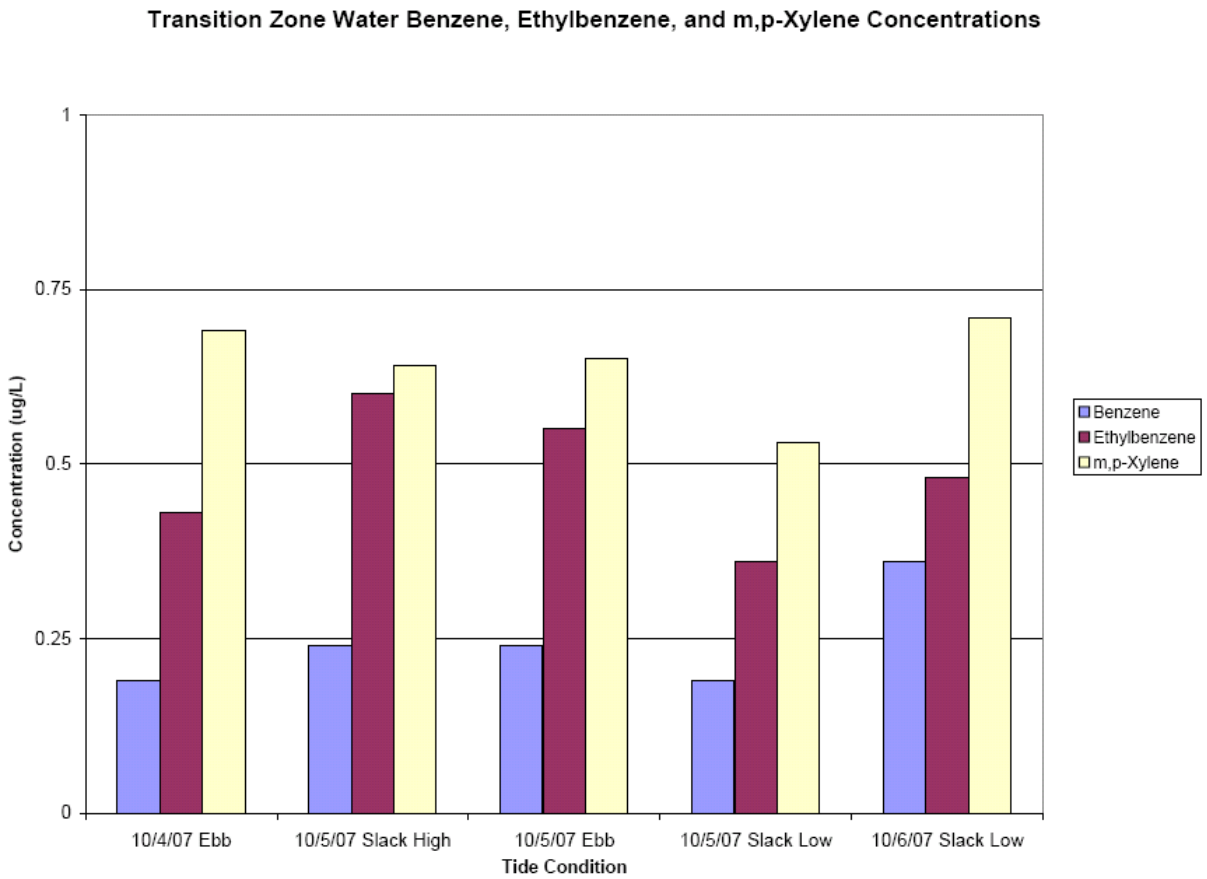
Figure 1.19
Benzo(a)pyrene and Naphthalene in Groundwater
3D Visualization Model
Gasco, Portland, Oregon





ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2.1
Station GS-B7 TZW Metals Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon



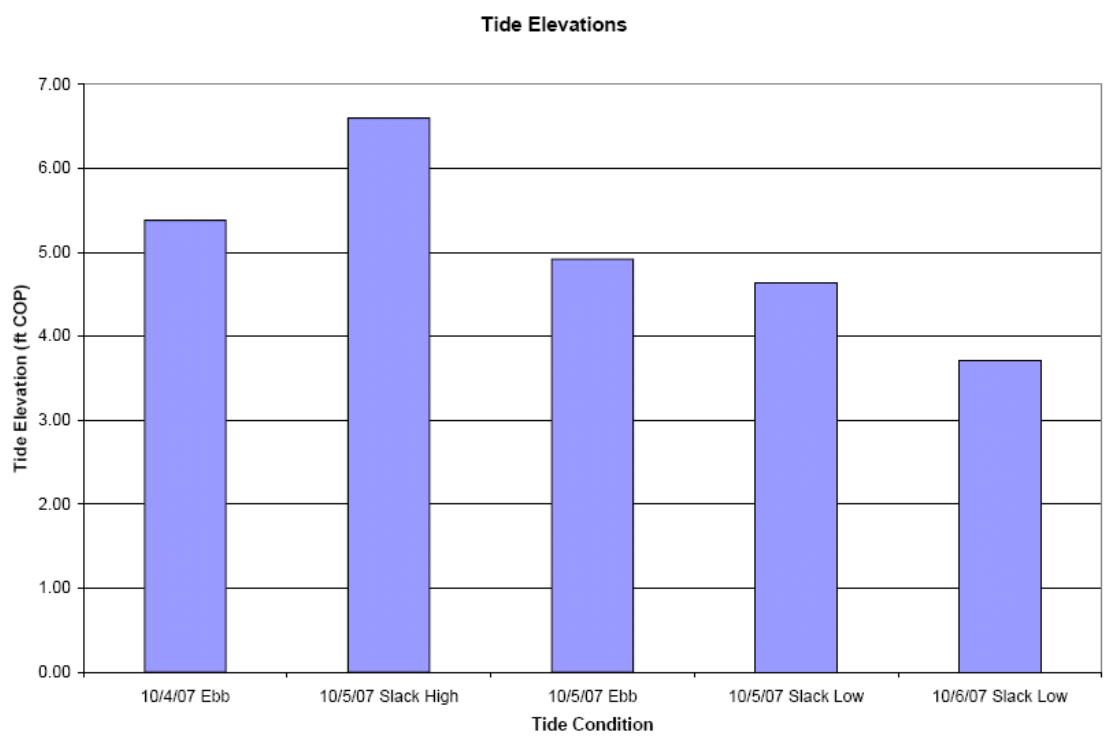
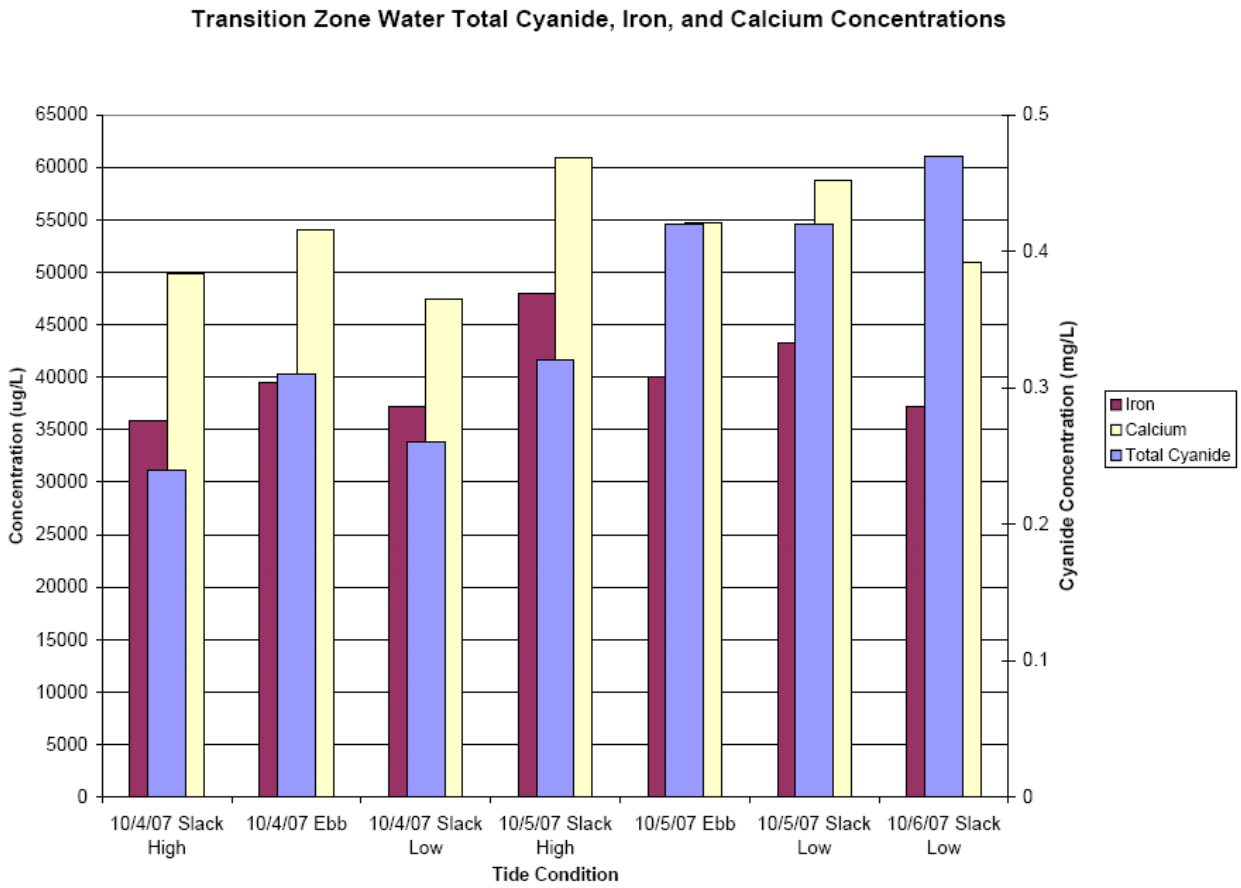
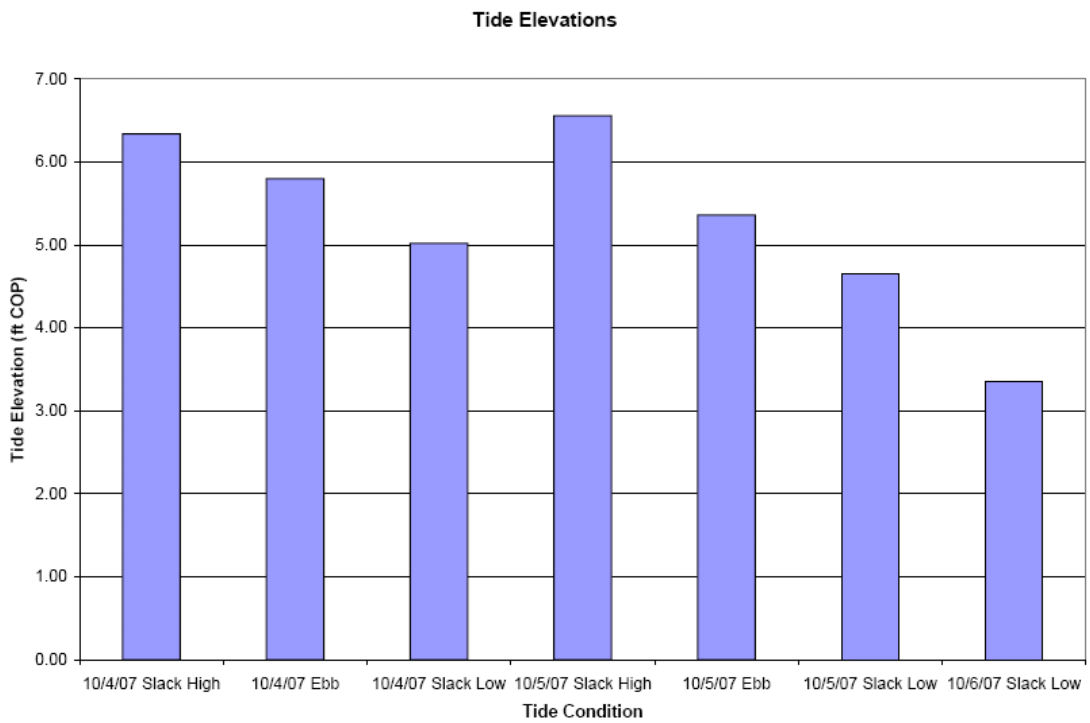


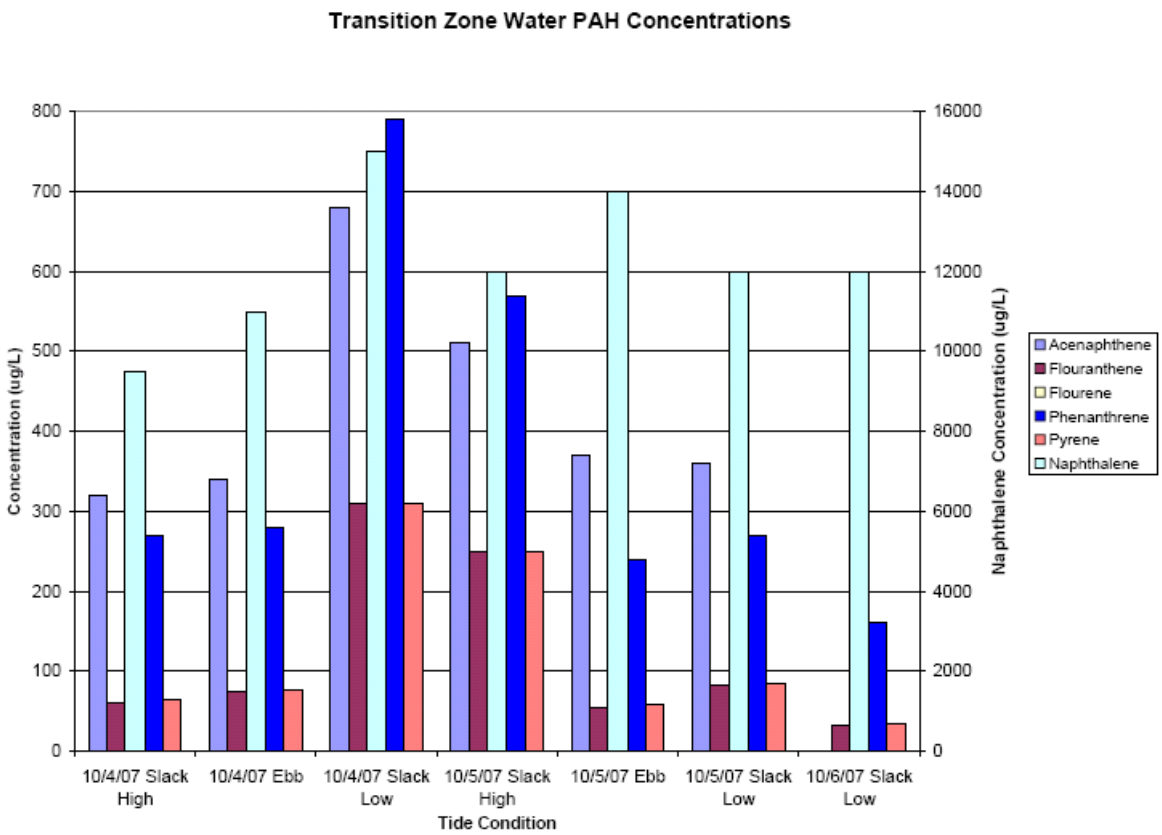
Figure 2.2
Station GS-B7 TZW BTEX Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon





ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2.3
Station GS-C7 TZW Metals/Cyanide Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland Oregon



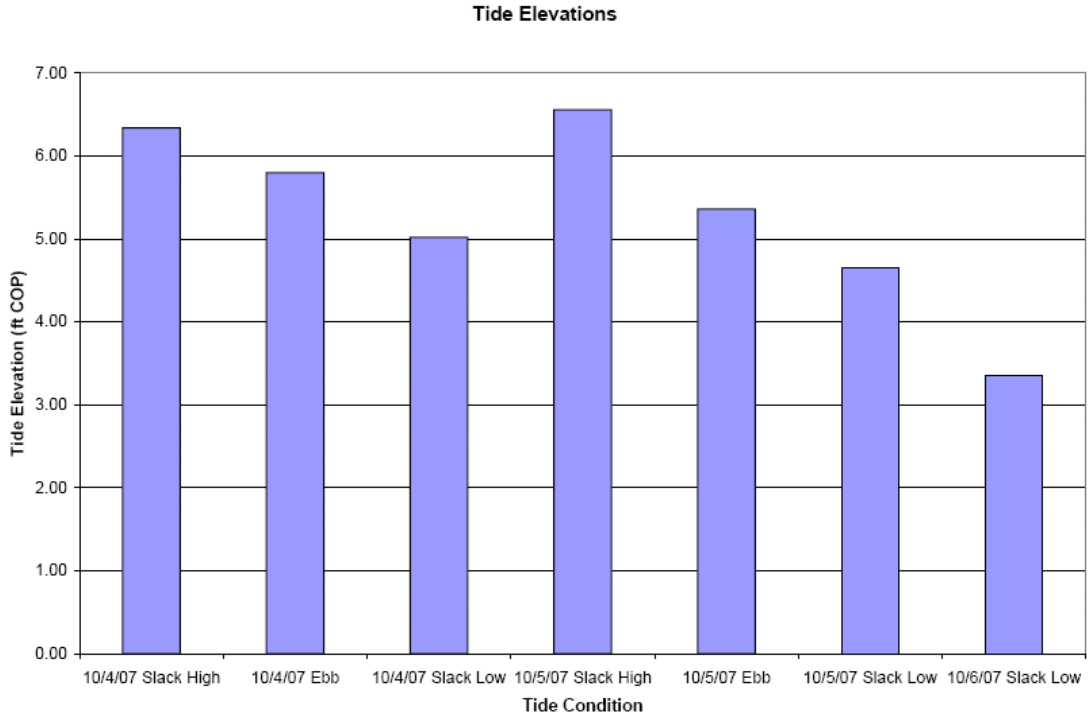
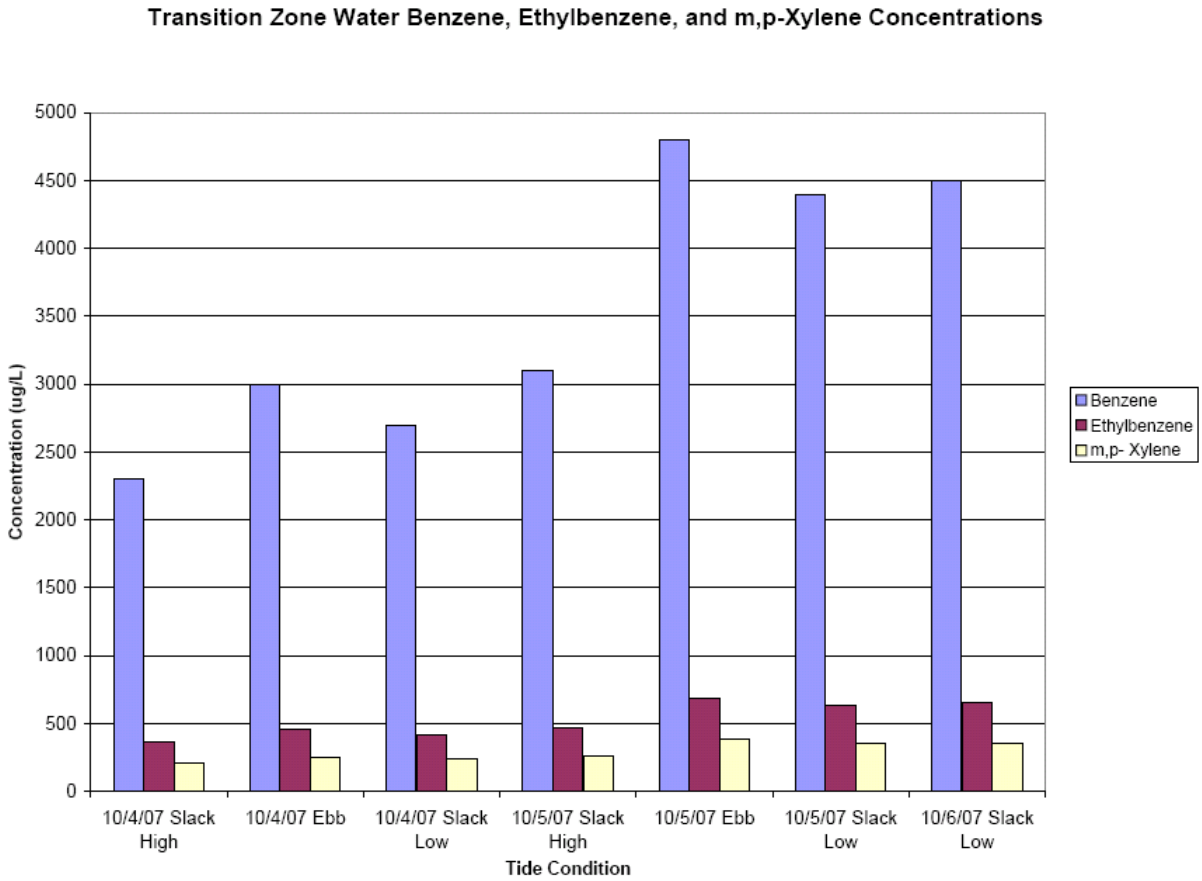
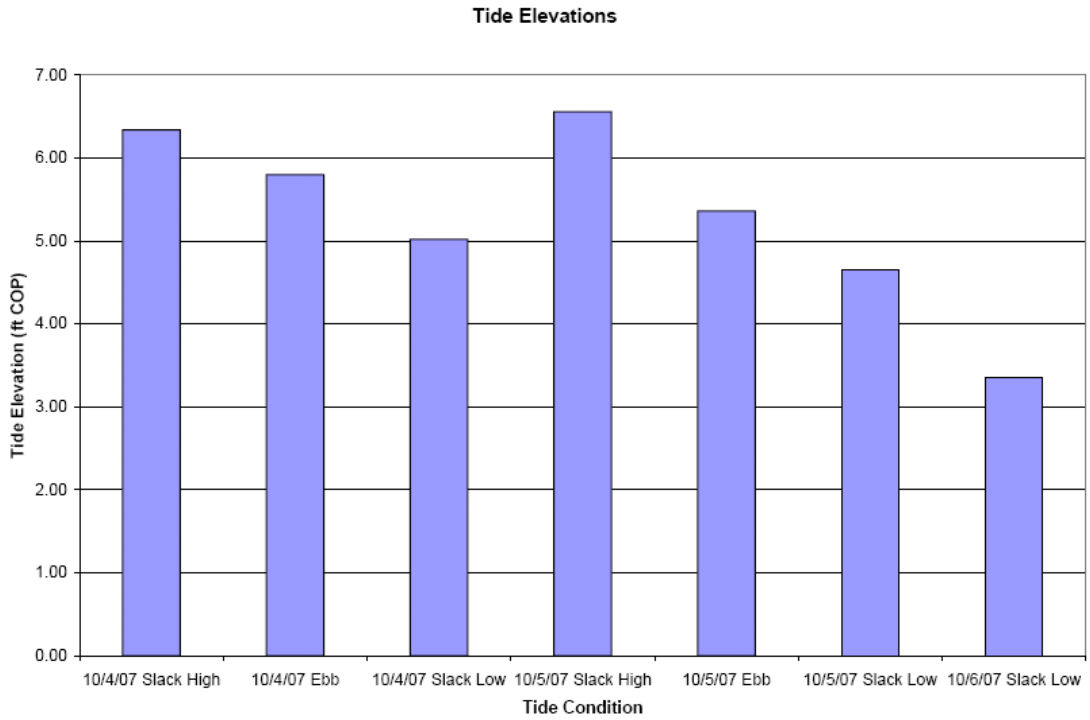


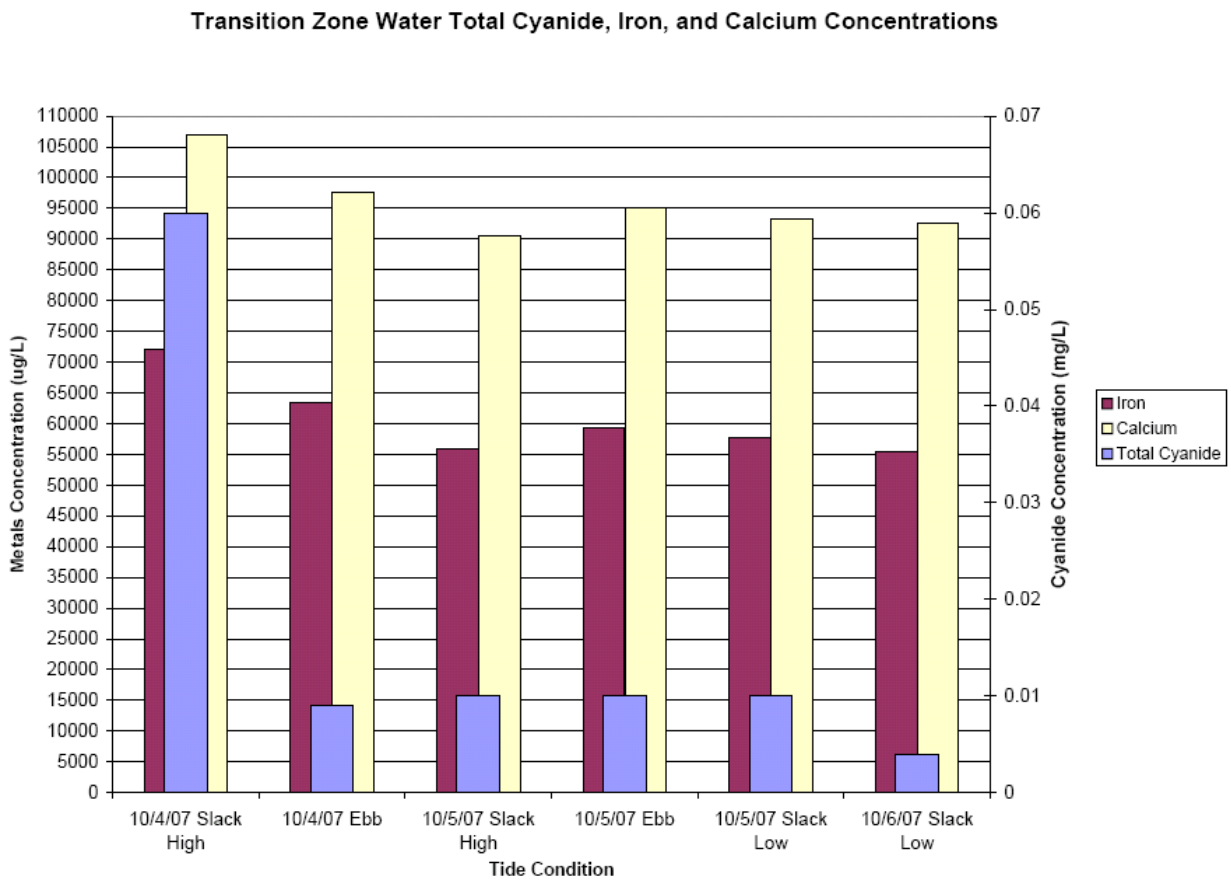
Figure 2.4
Station GS-C7 TZW PAH Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon

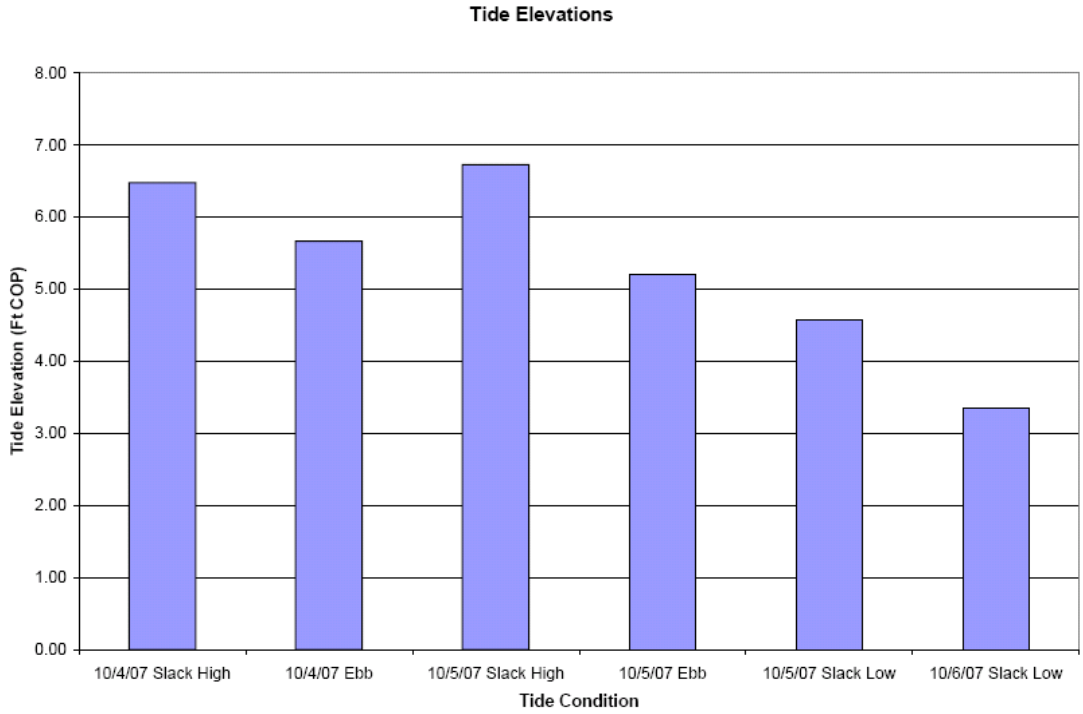




ANCHOR ENVIRONMENTAL, L.L.C.

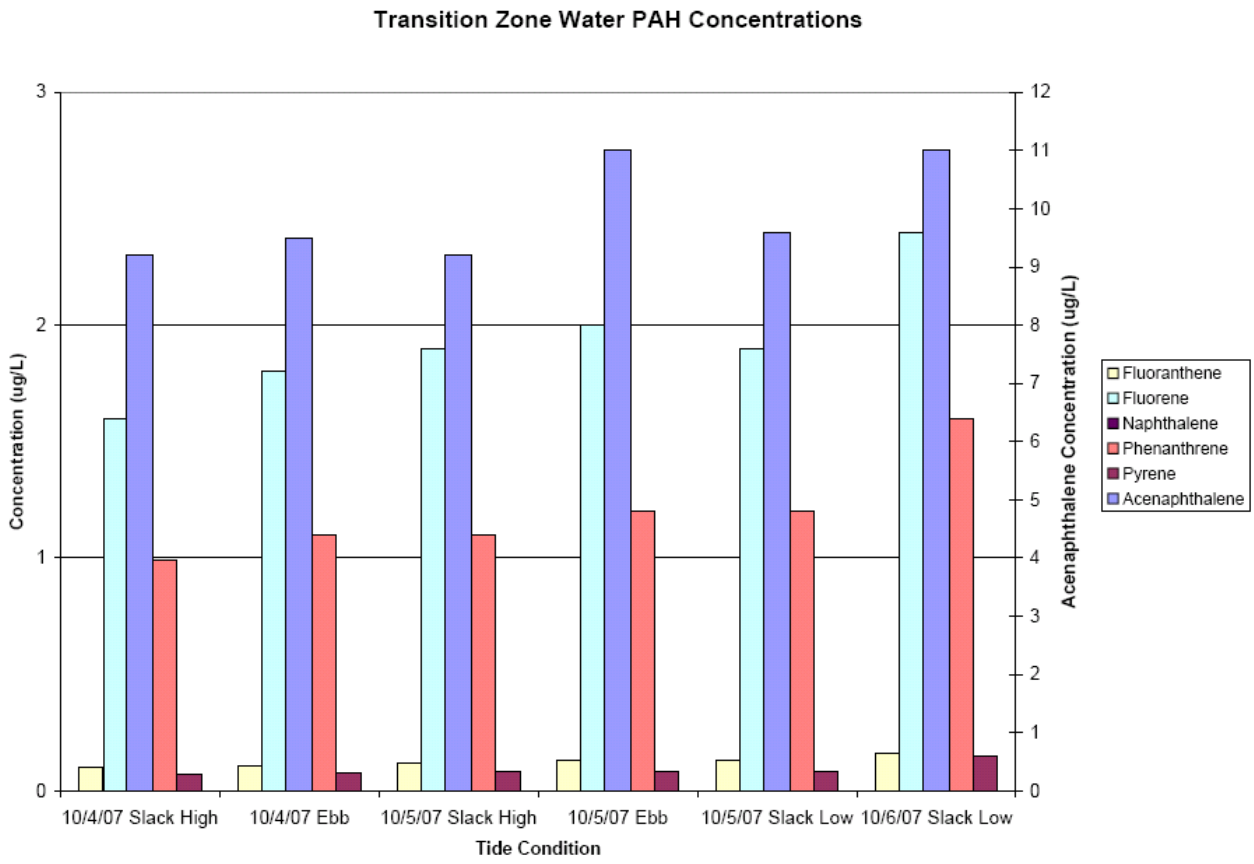
Figure 2.5
Station GS-C7 TZW BTEX Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon





ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2.6
Station GS-D5 TZW Metals/Cyanide Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon



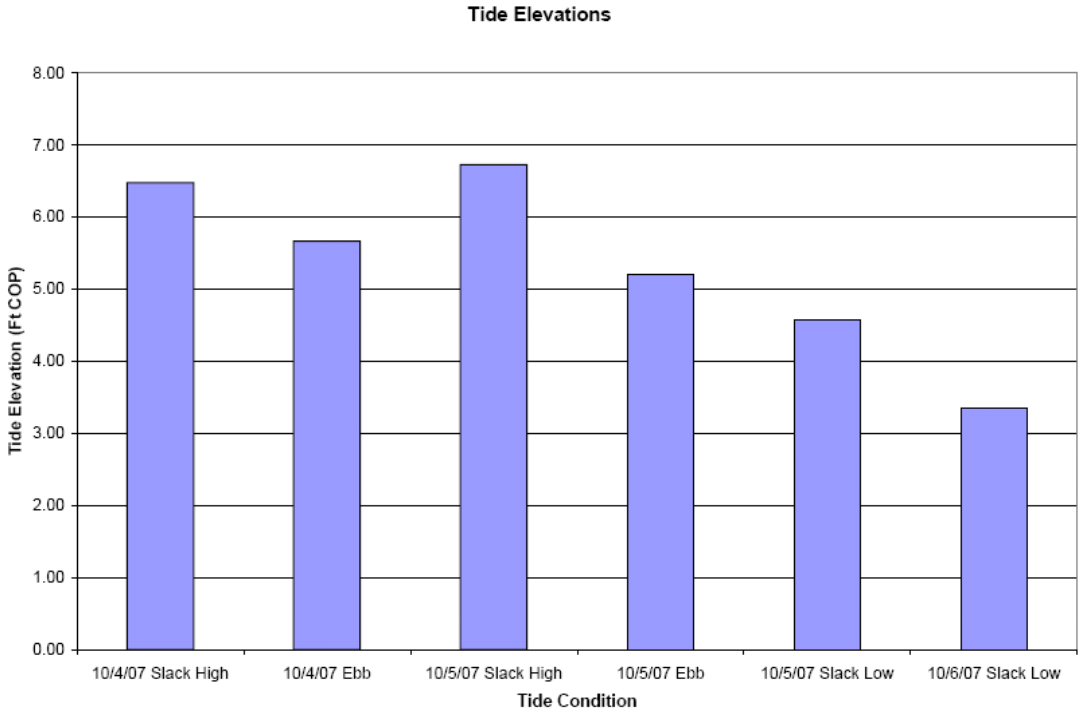
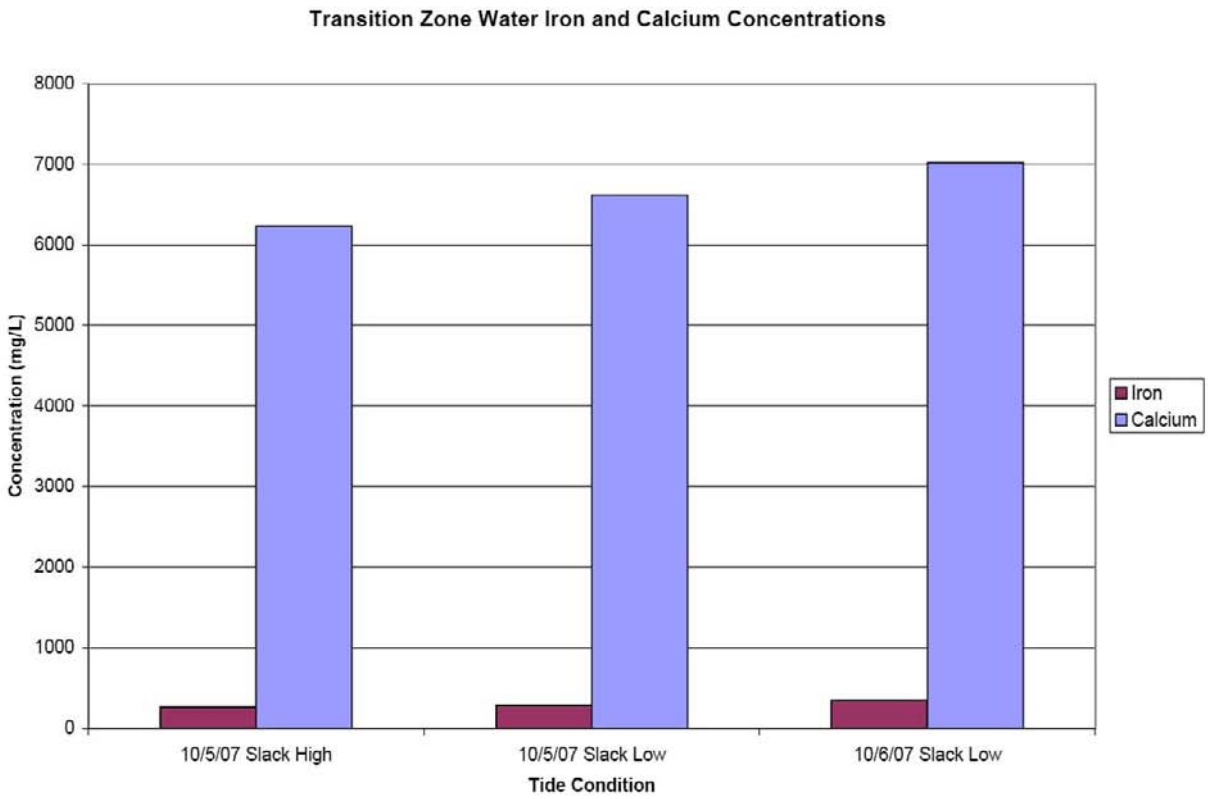


Figure 2.7
Station GS-D5 TZW PAH Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon



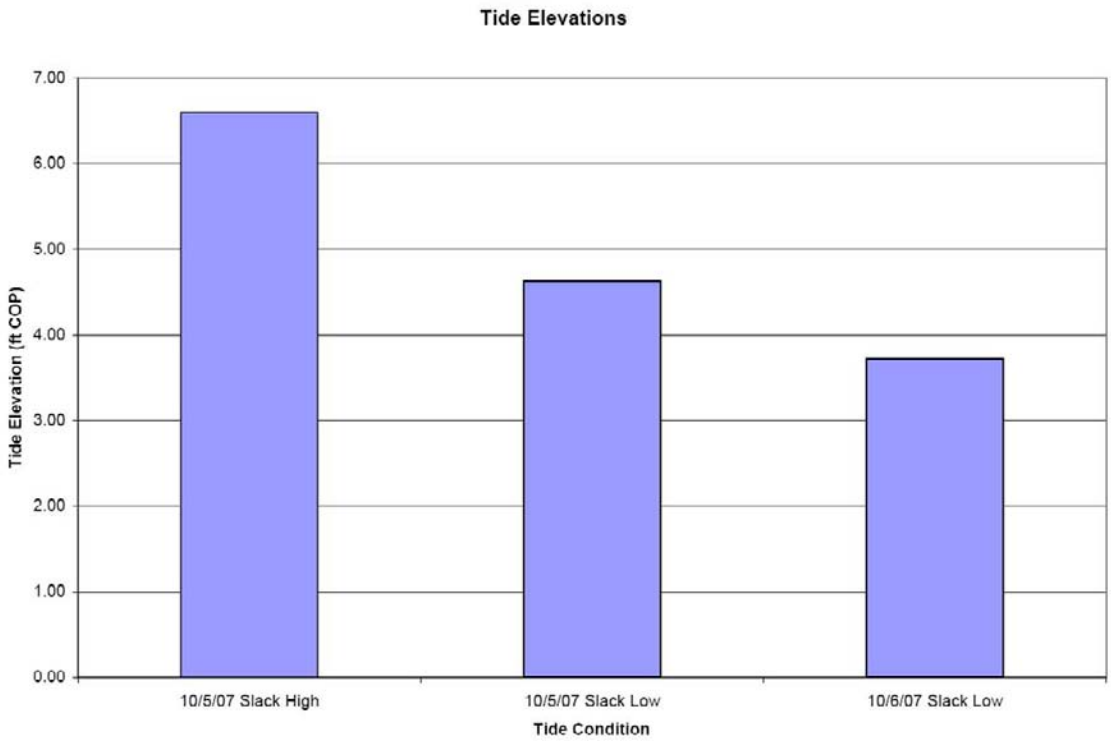
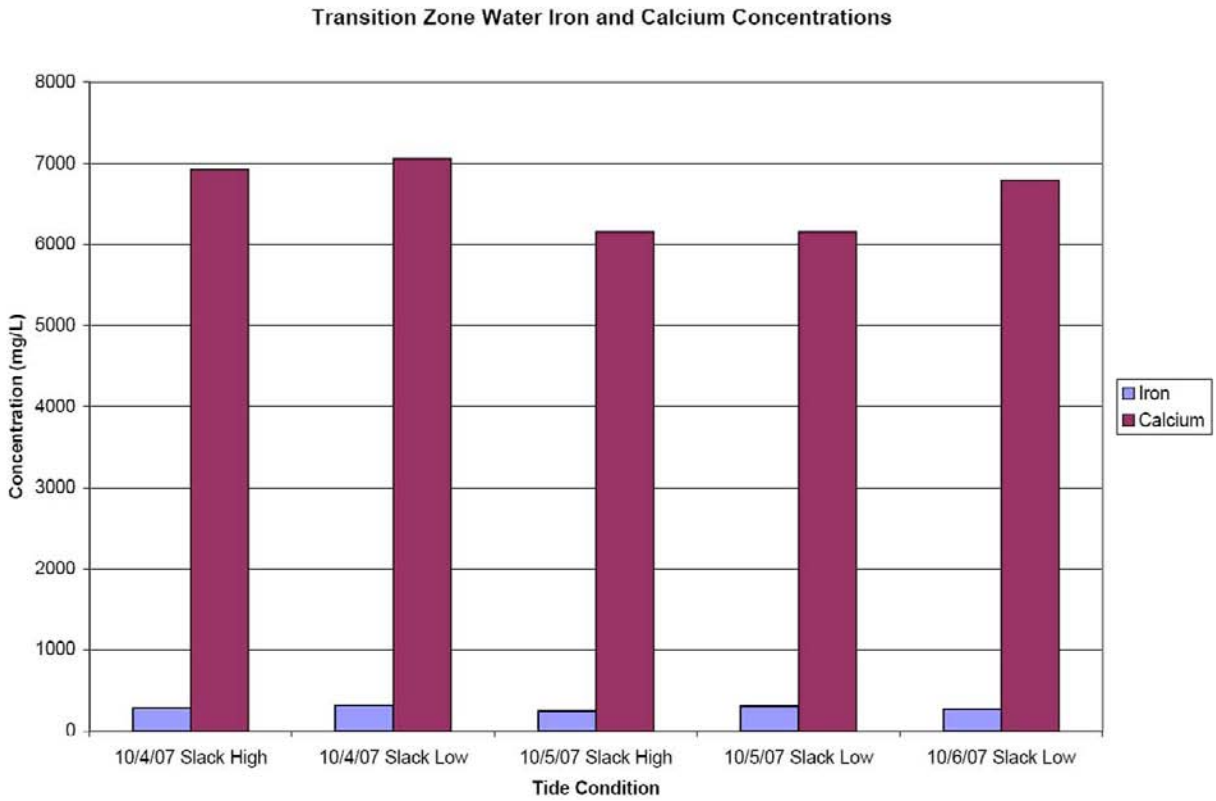


Figure 2.8
Station GS-B7 Near Bottom Surface Water Metals Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon



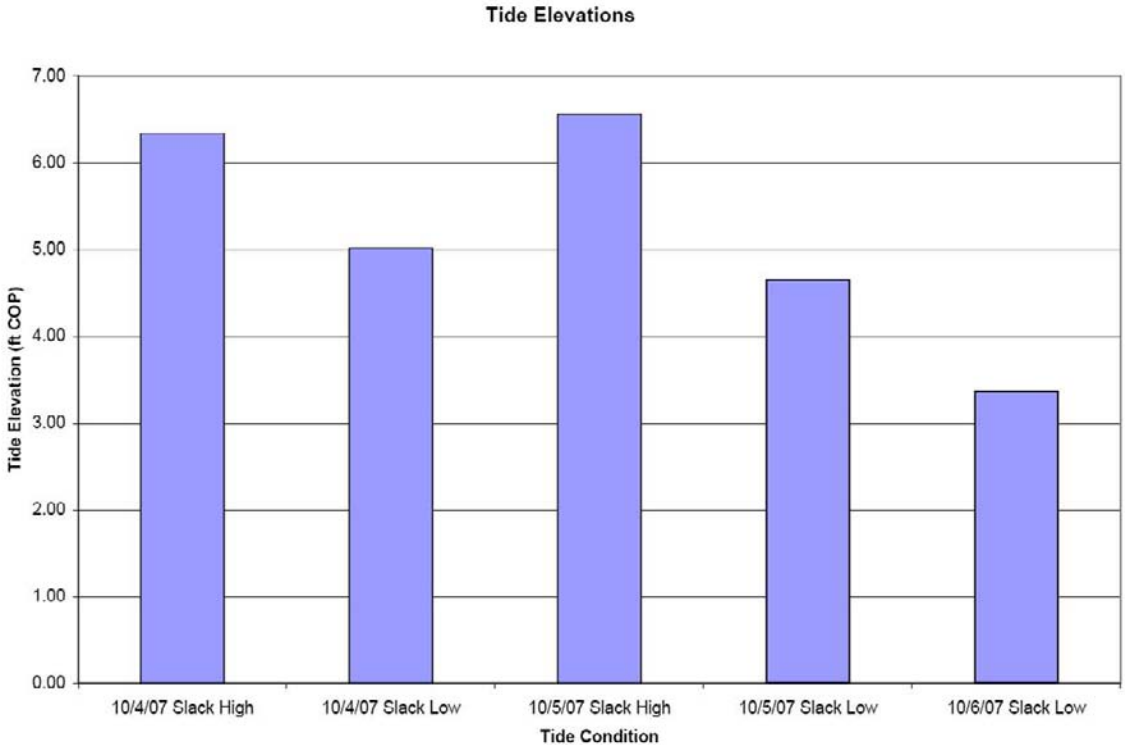
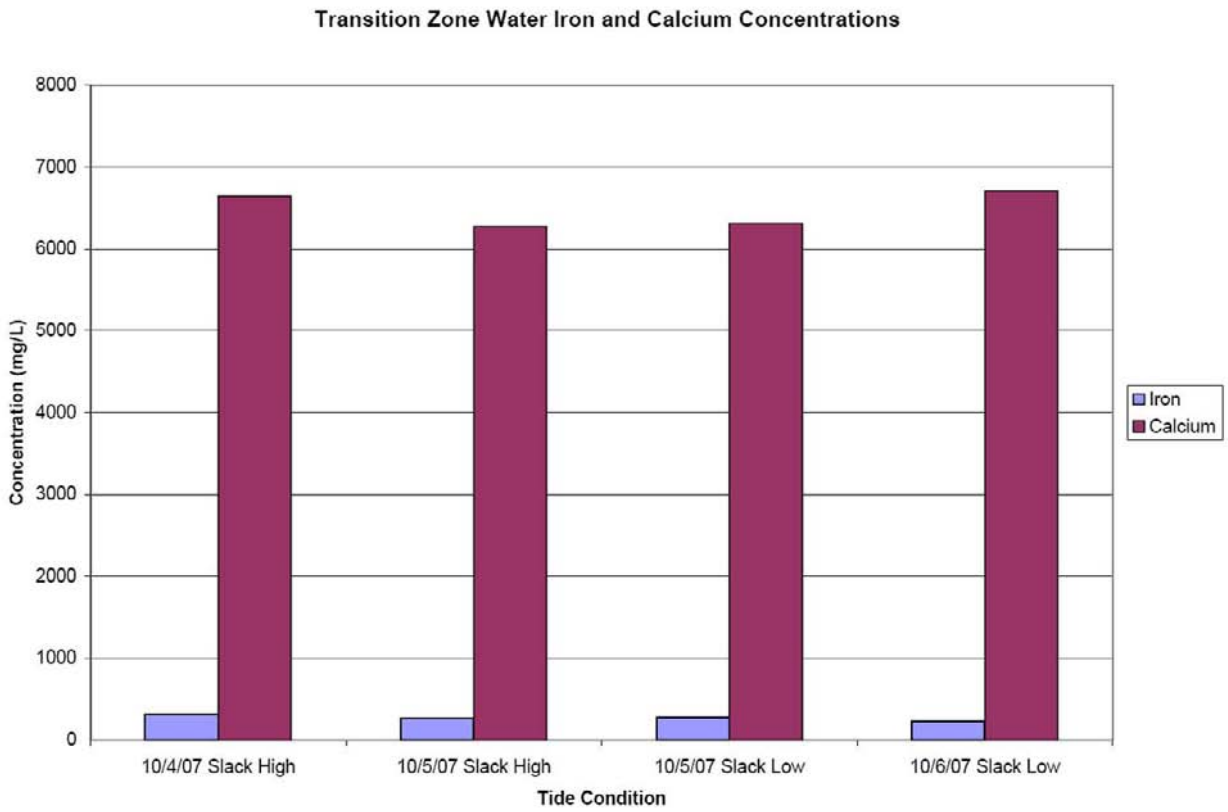


Figure 2.9

ANCHOR ENVIRONMENTAL, L.L.C.

Station GS-C7 Near Bottom Surface Water Metals Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon



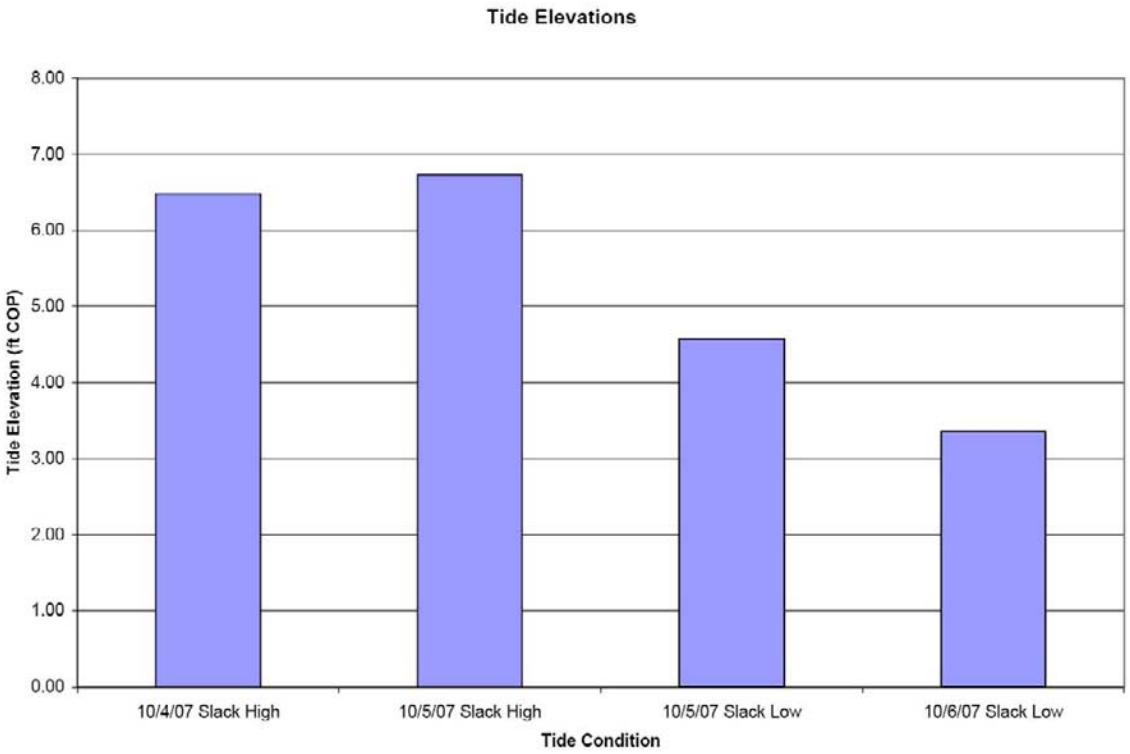
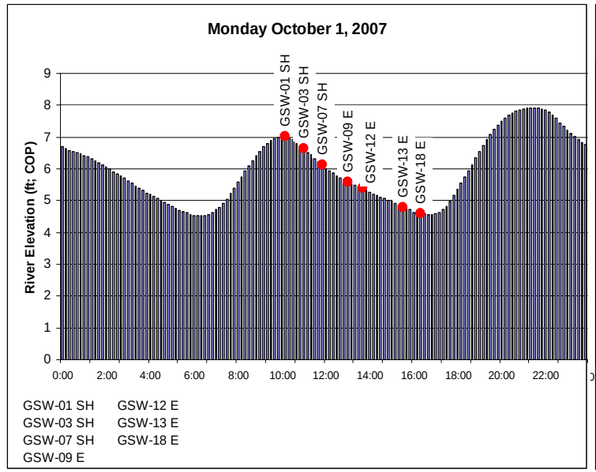
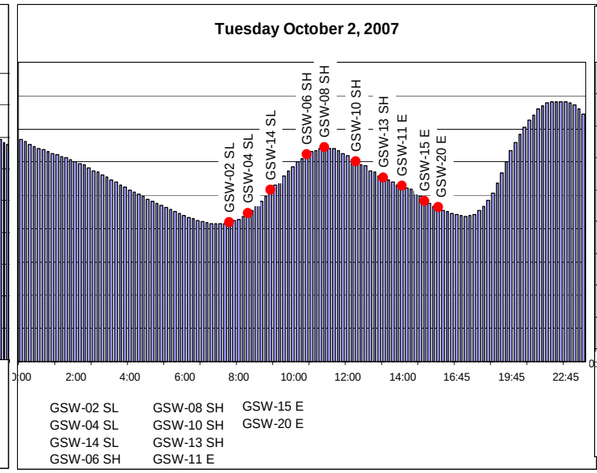
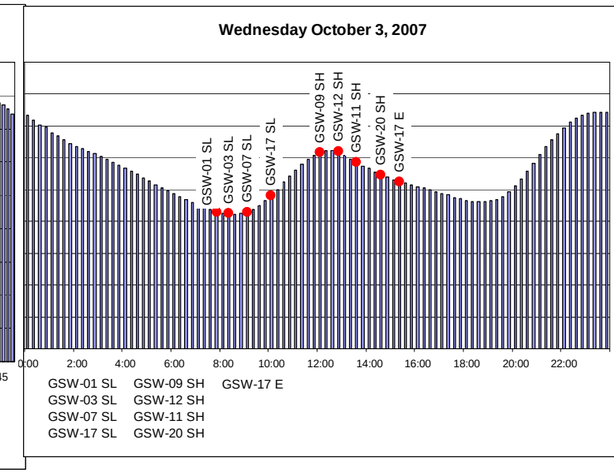


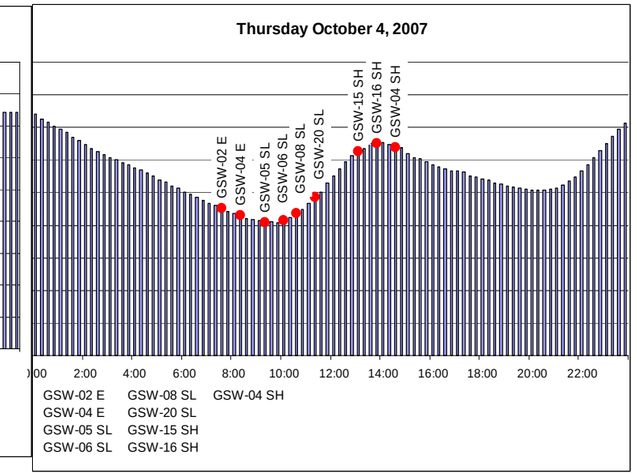
Figure 2.10

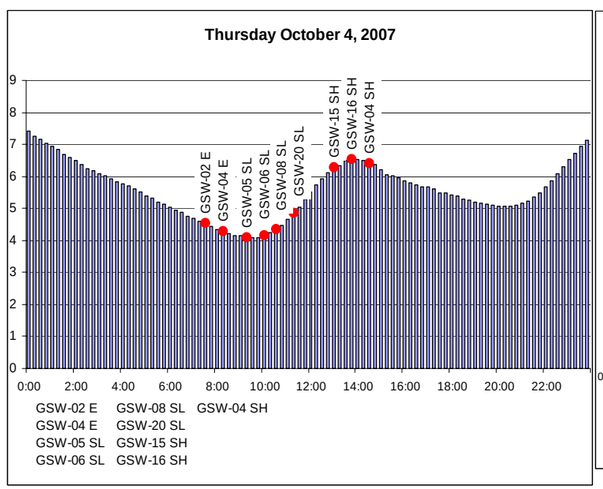
Station GS-D5 Near Bottom Surface Water Metals Concentrations and Tide Elevations
NW Natural – Gasco Site
Portland, Oregon

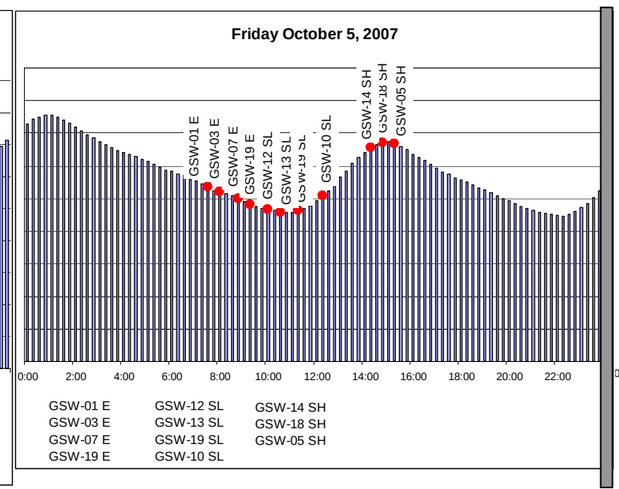


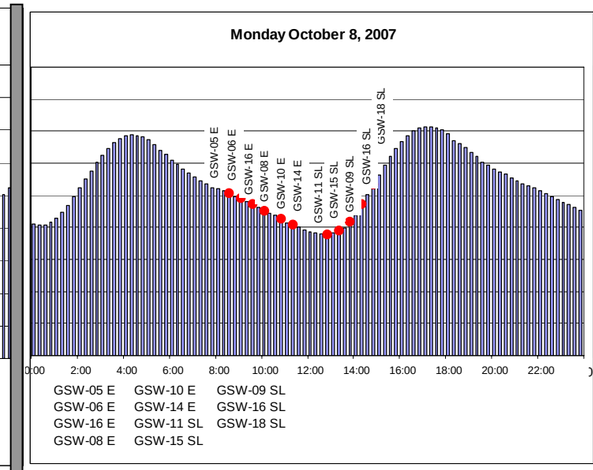


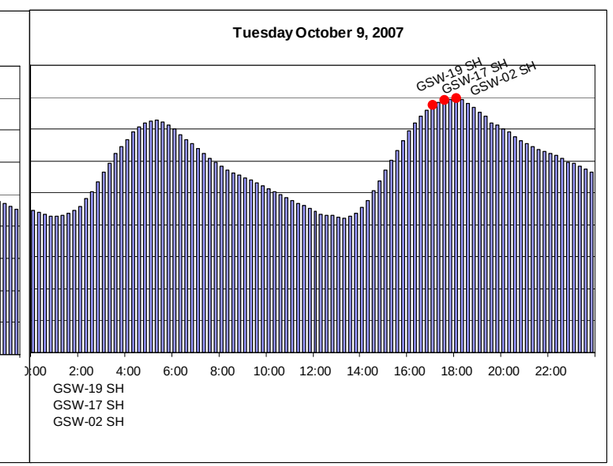






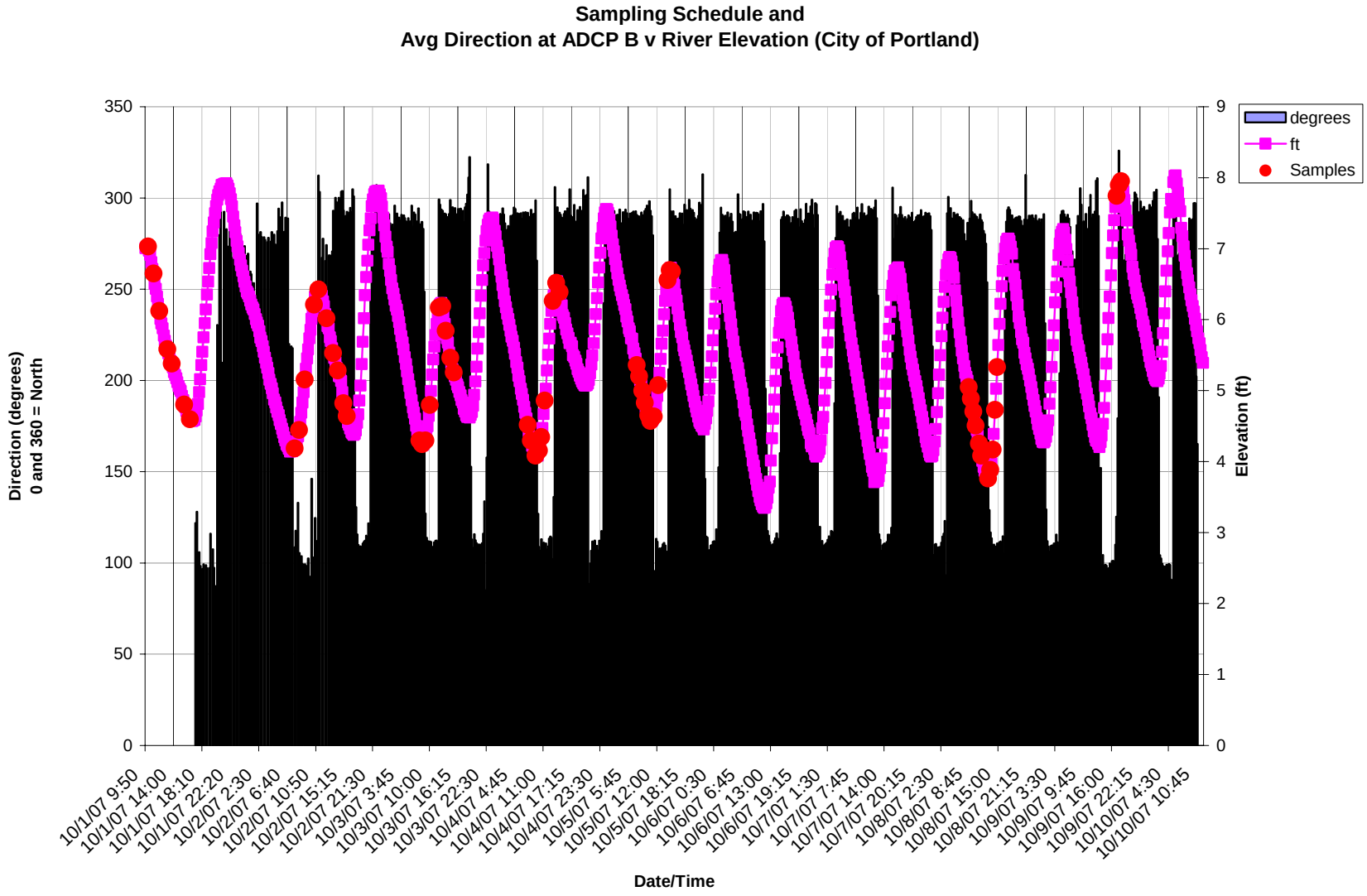






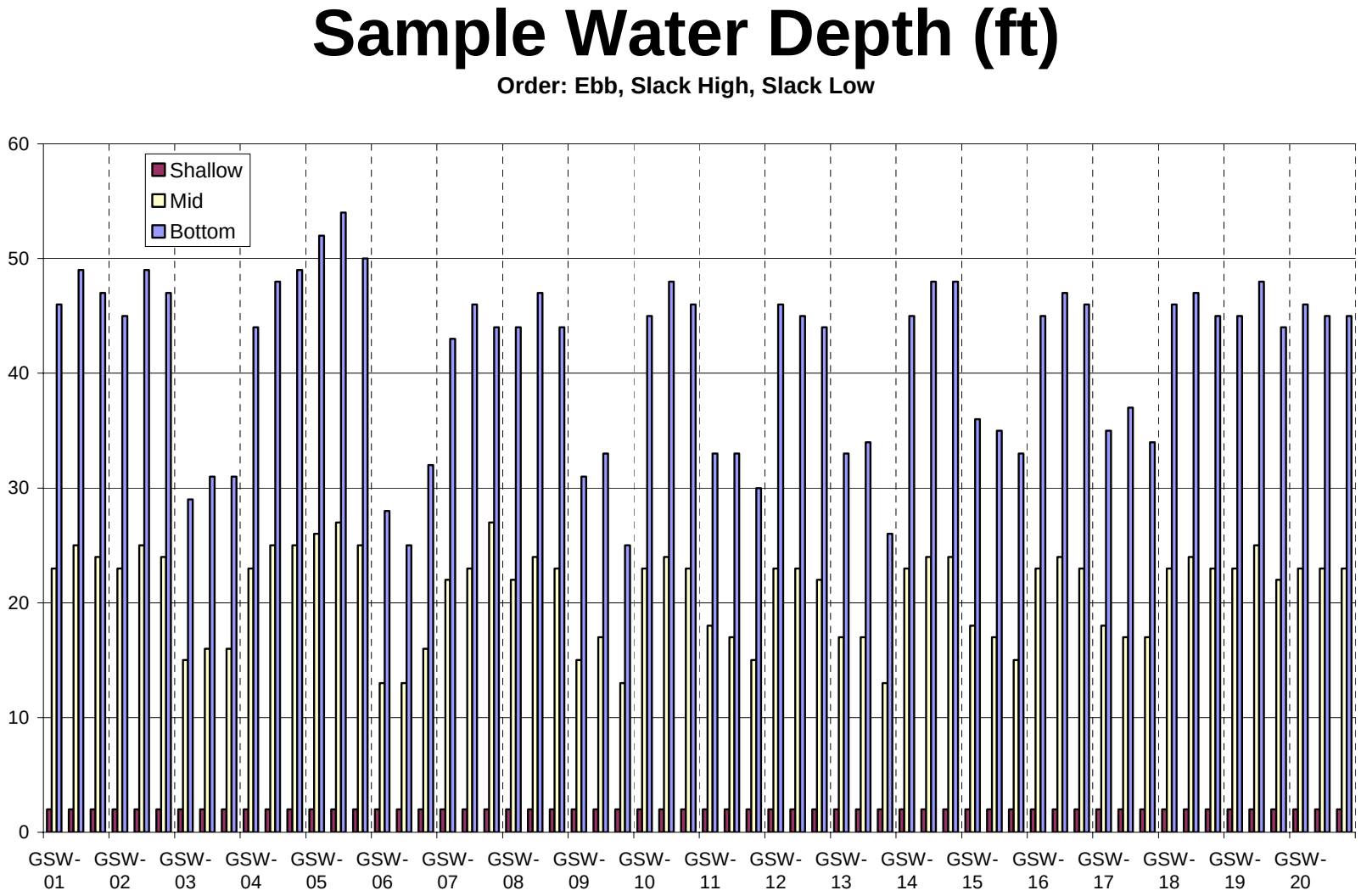
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.1a
Cyanide Sampling Schedule by Day
NW Natural – Gasco Site
Portland, Oregon



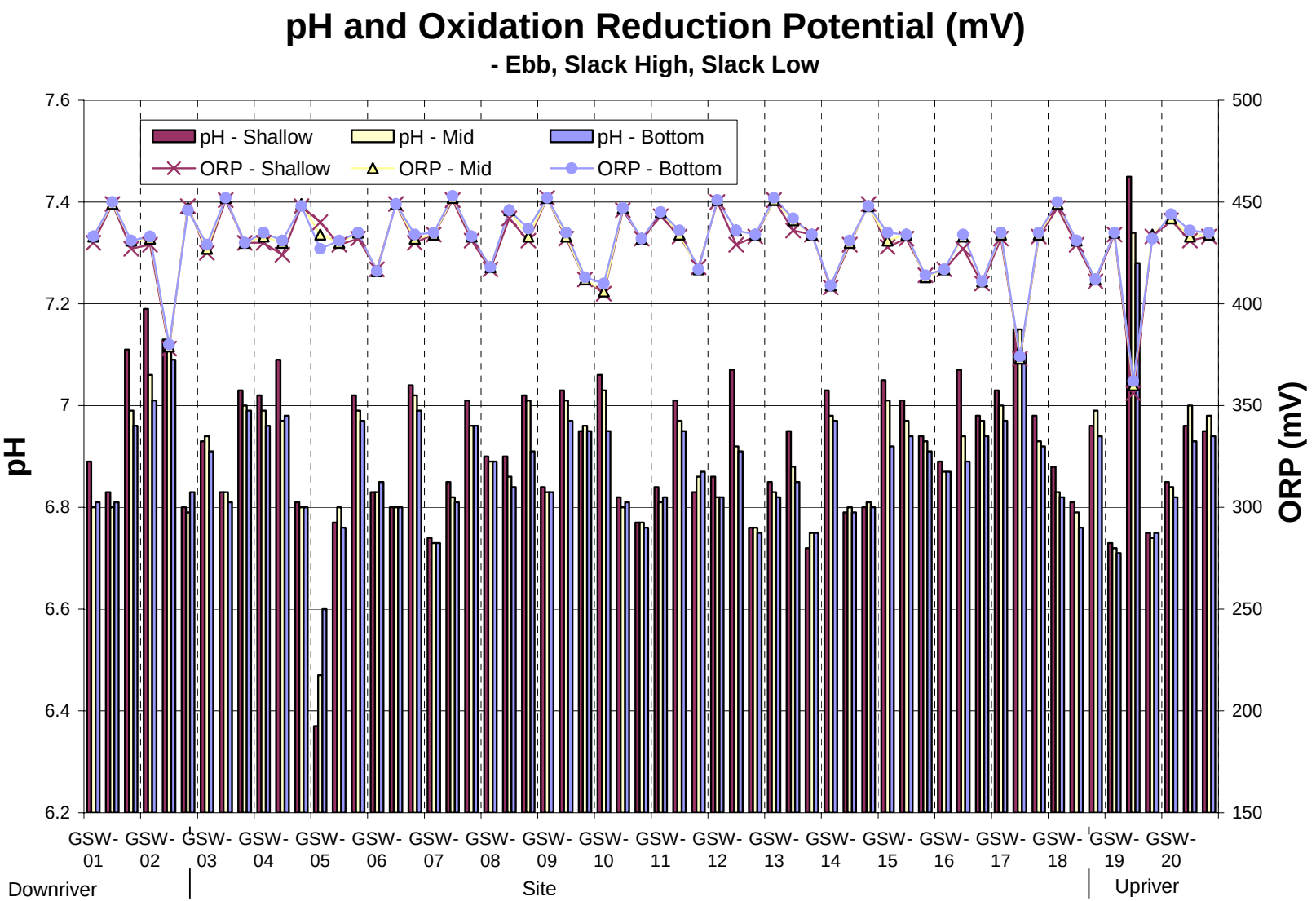
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.1b
Cyanide Sampling Schedule over Sampling Period
NW Natural – Gasco Site
Portland, Oregon



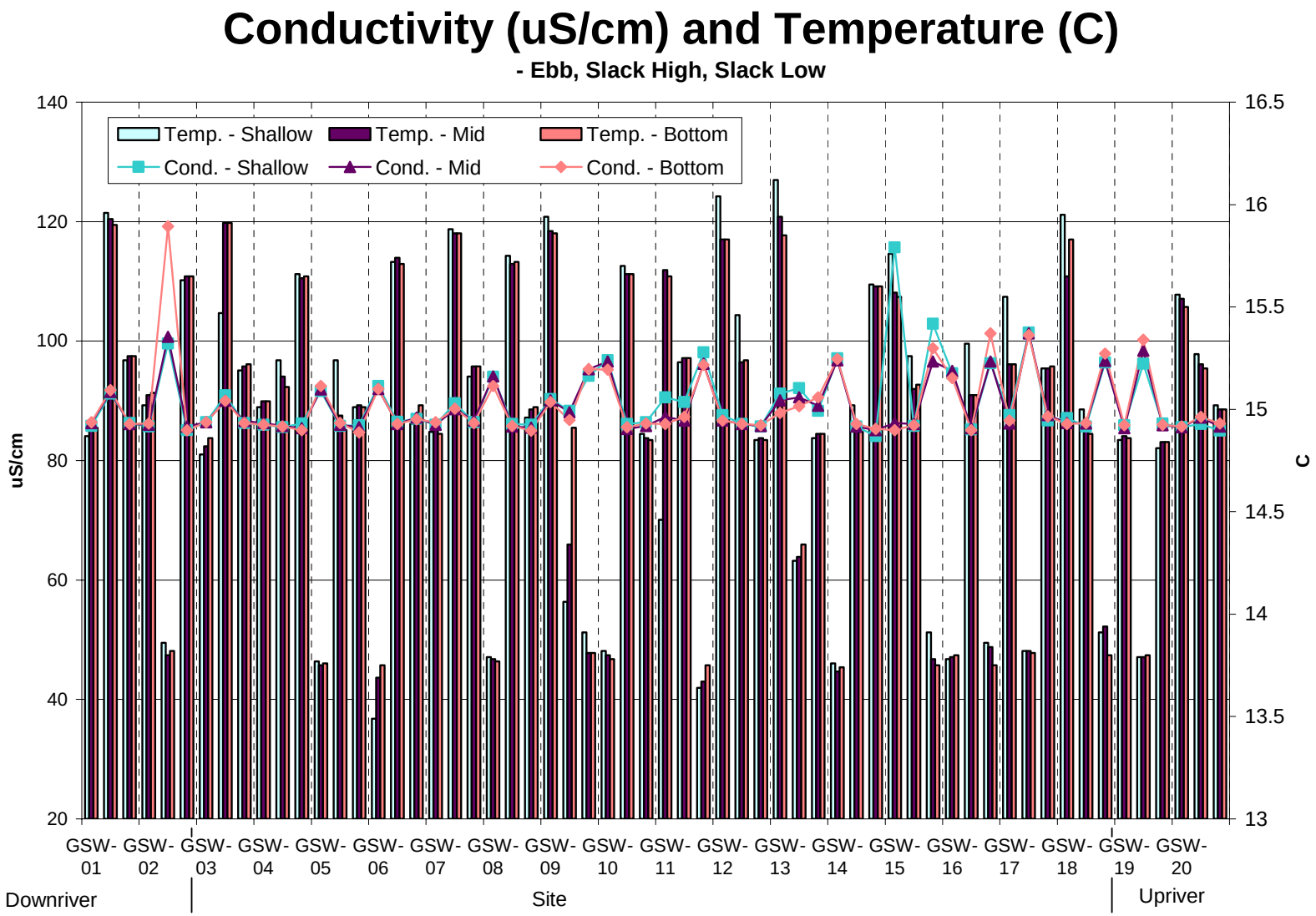
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.2
Cyanide Sample Water Depths
NW Natural – Gasco Site
Portland, Oregon



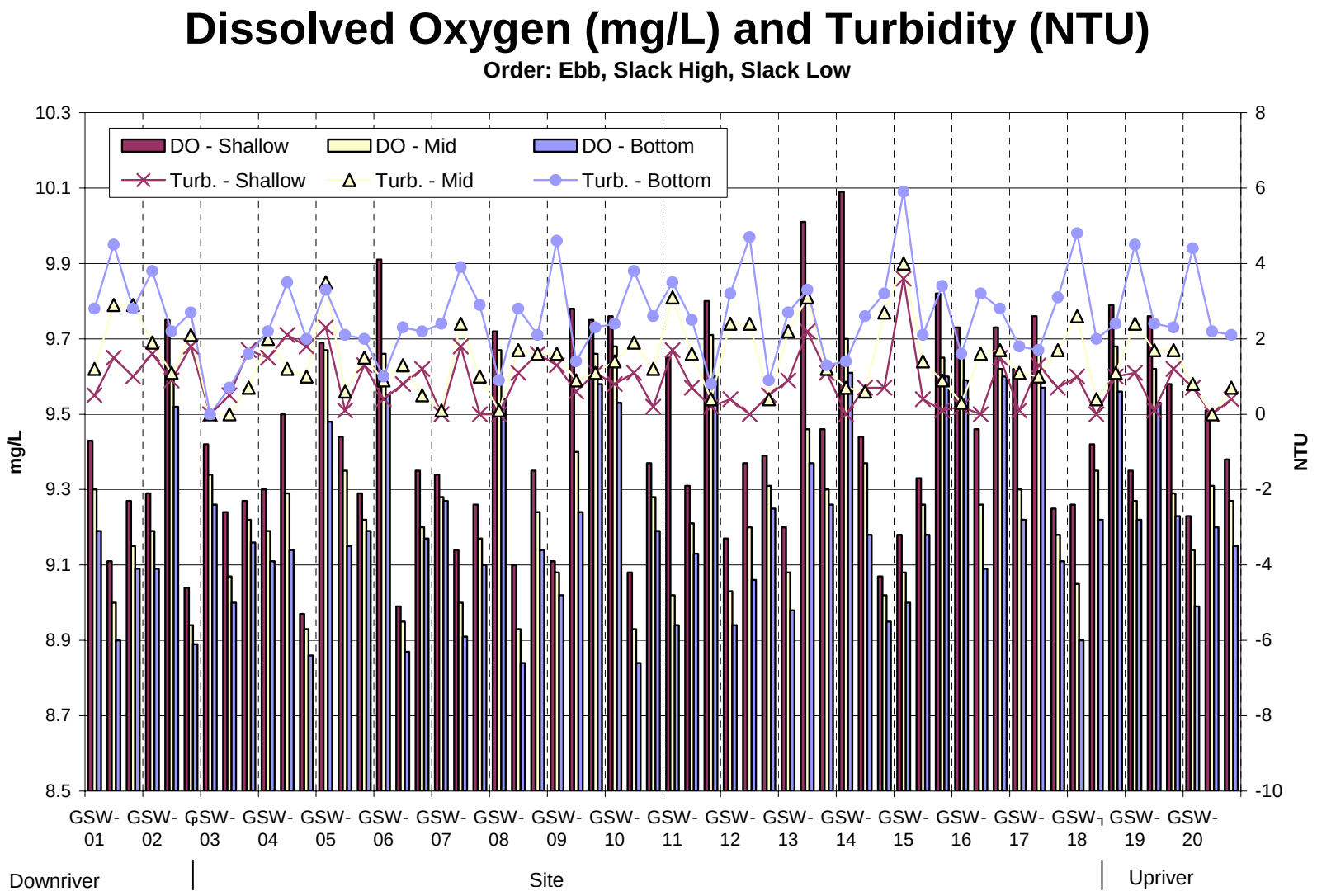
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.3
pH and ORP Results for Cyanide Samples
NW Natural – Gasco Site
Portland, Oregon



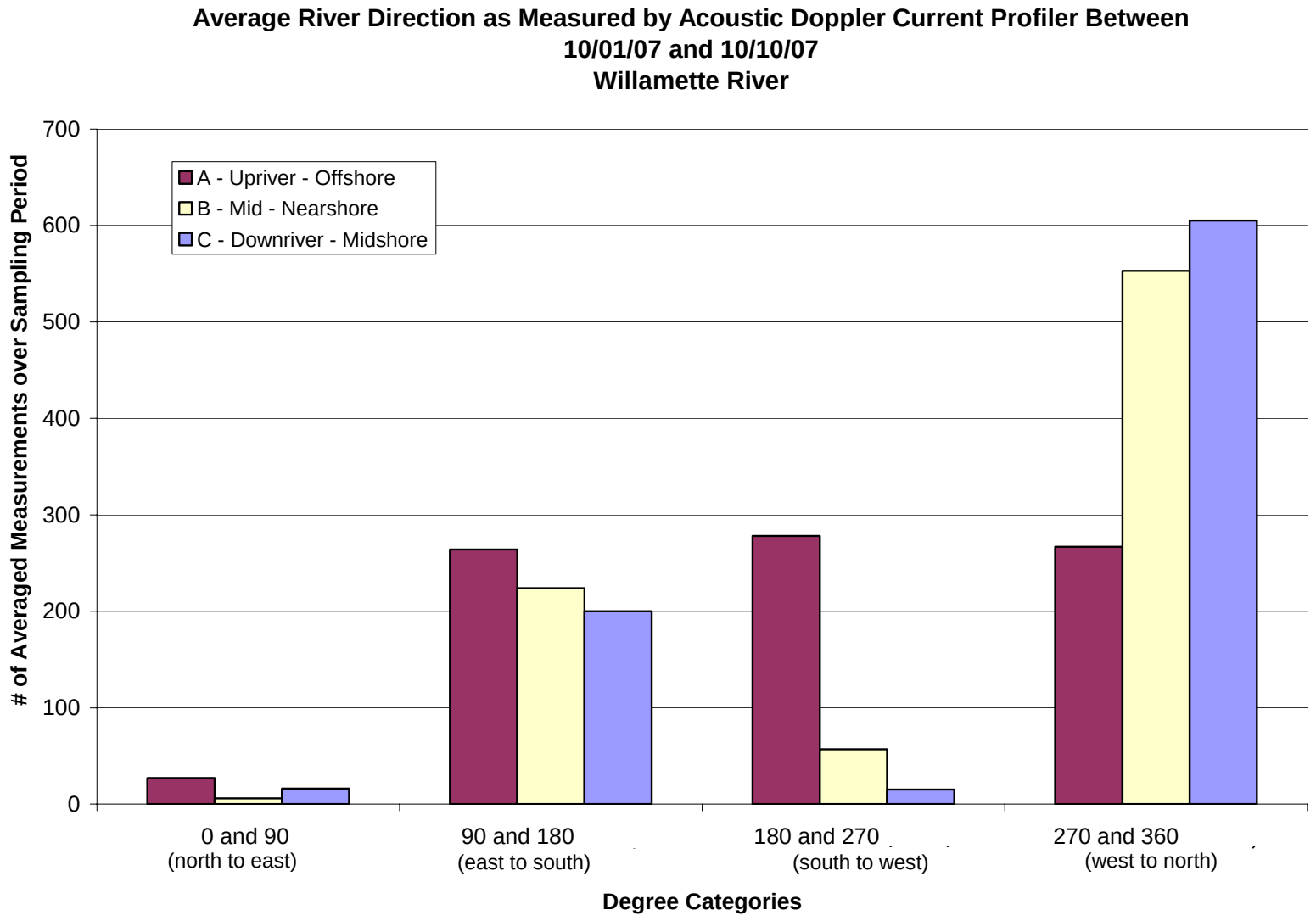
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.4
Conductivity and Temperature Results for Cyanide Samples
NW Natural – Gasco Site
Portland, Oregon



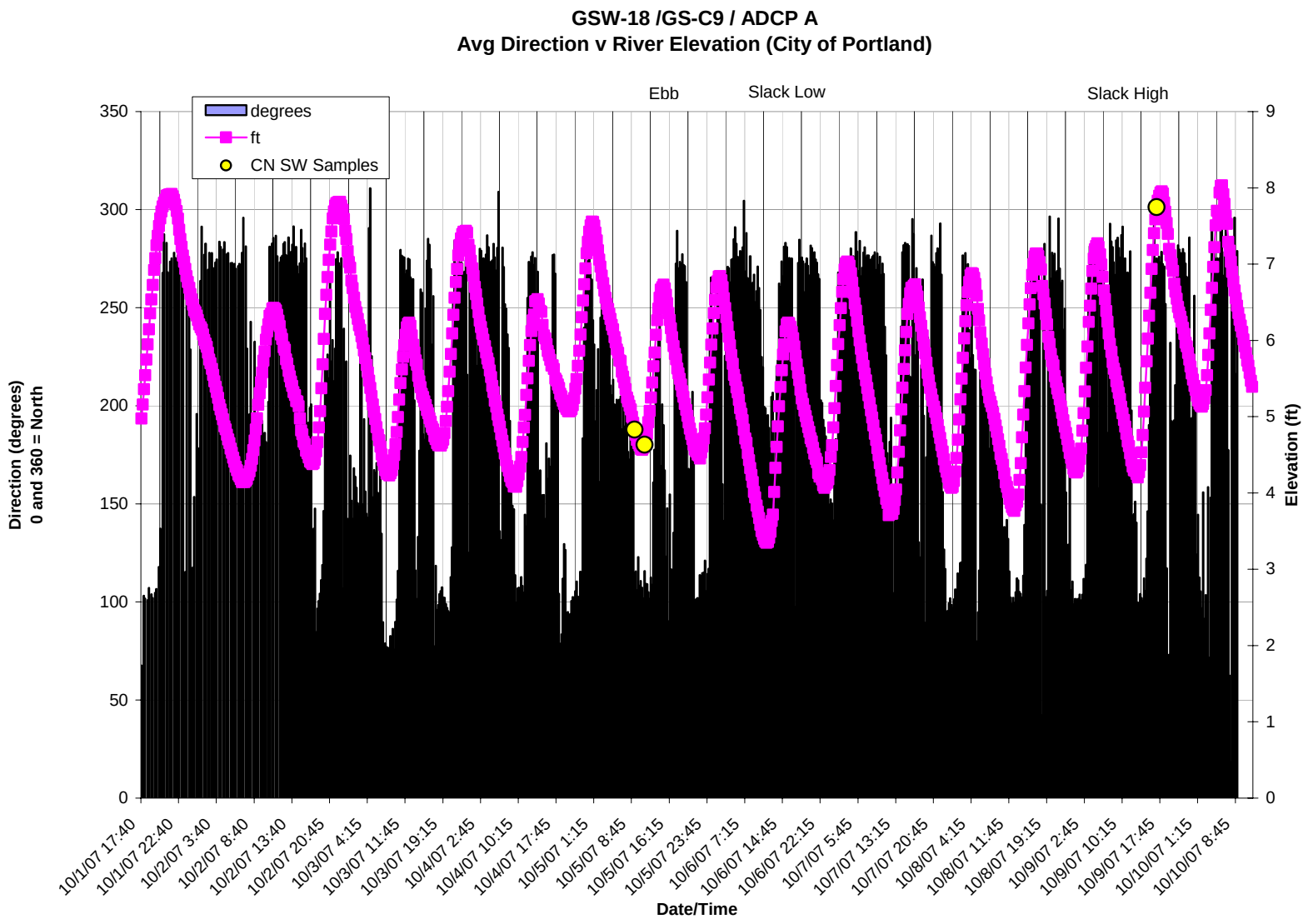
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.5
Dissolved Oxygen and Turbidity Results for Cyanide Samples
NW Natural – Gasco Site
Portland, Oregon



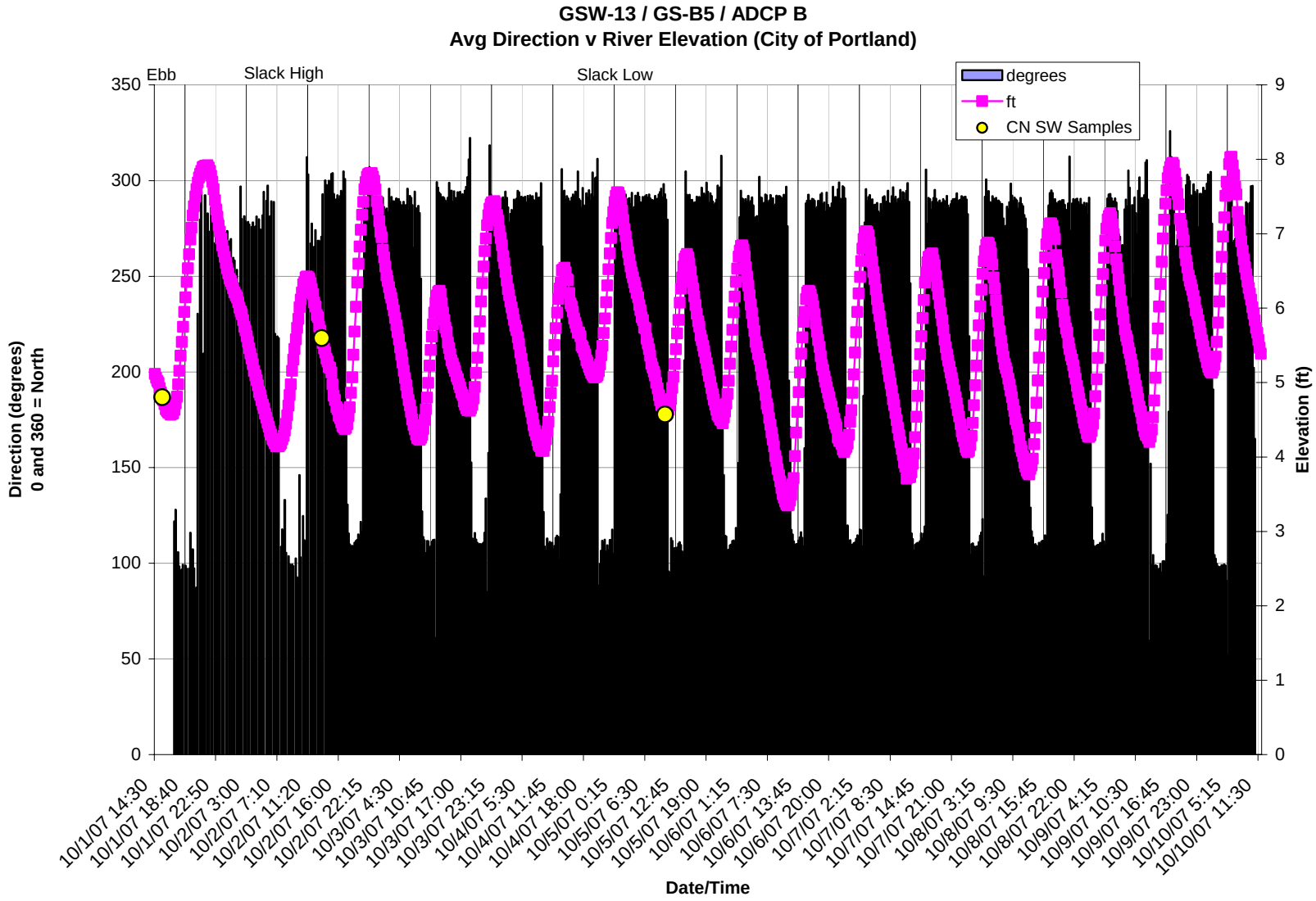
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.6
Acoustic Doppler: Directional Reading Frequency Summary
NW Natural – Gasco Site
Portland, Oregon



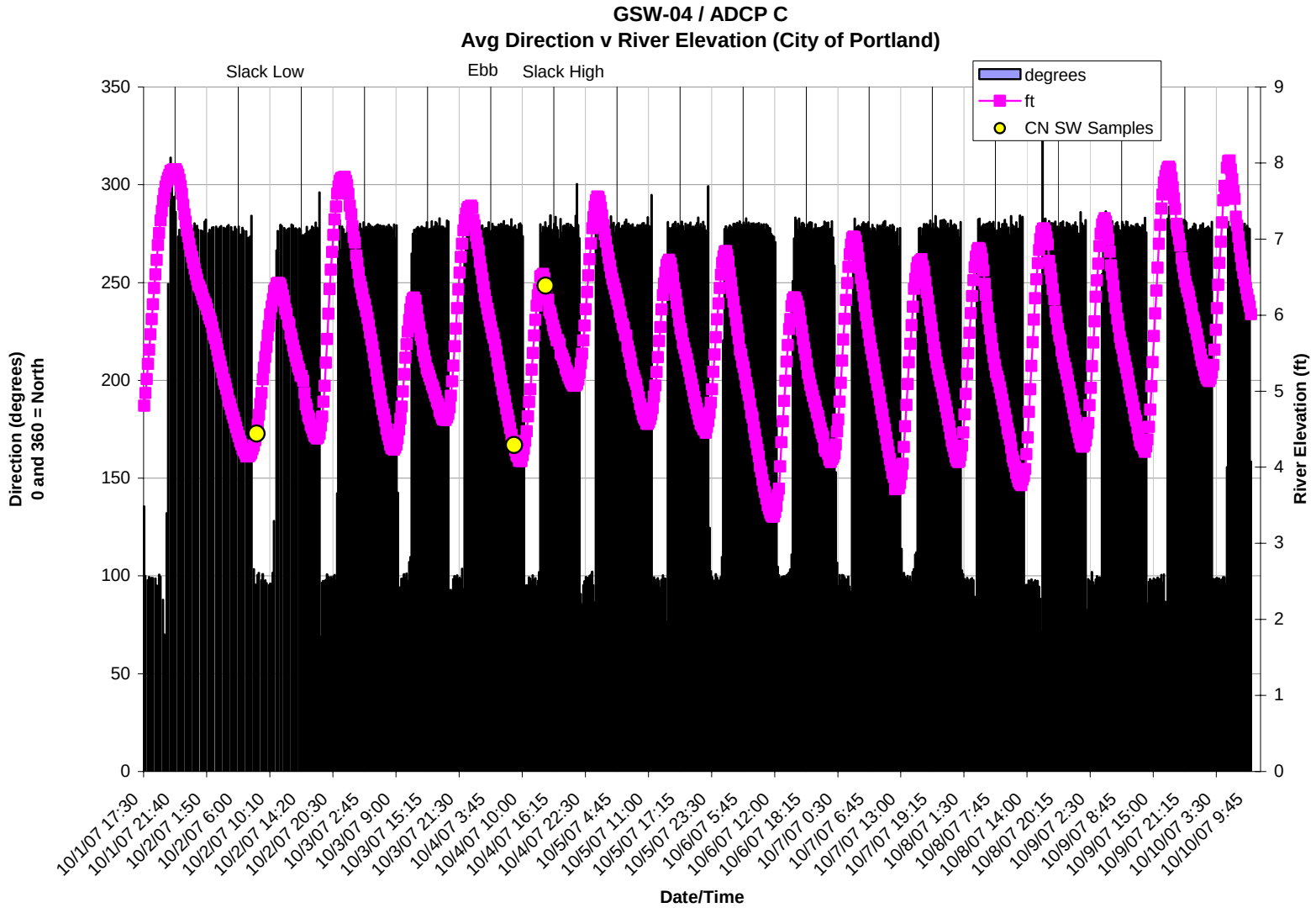
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.7a
Acoustic Doppler A: Direction v River Elevations
NW Natural – Gasco Site
Portland, Oregon



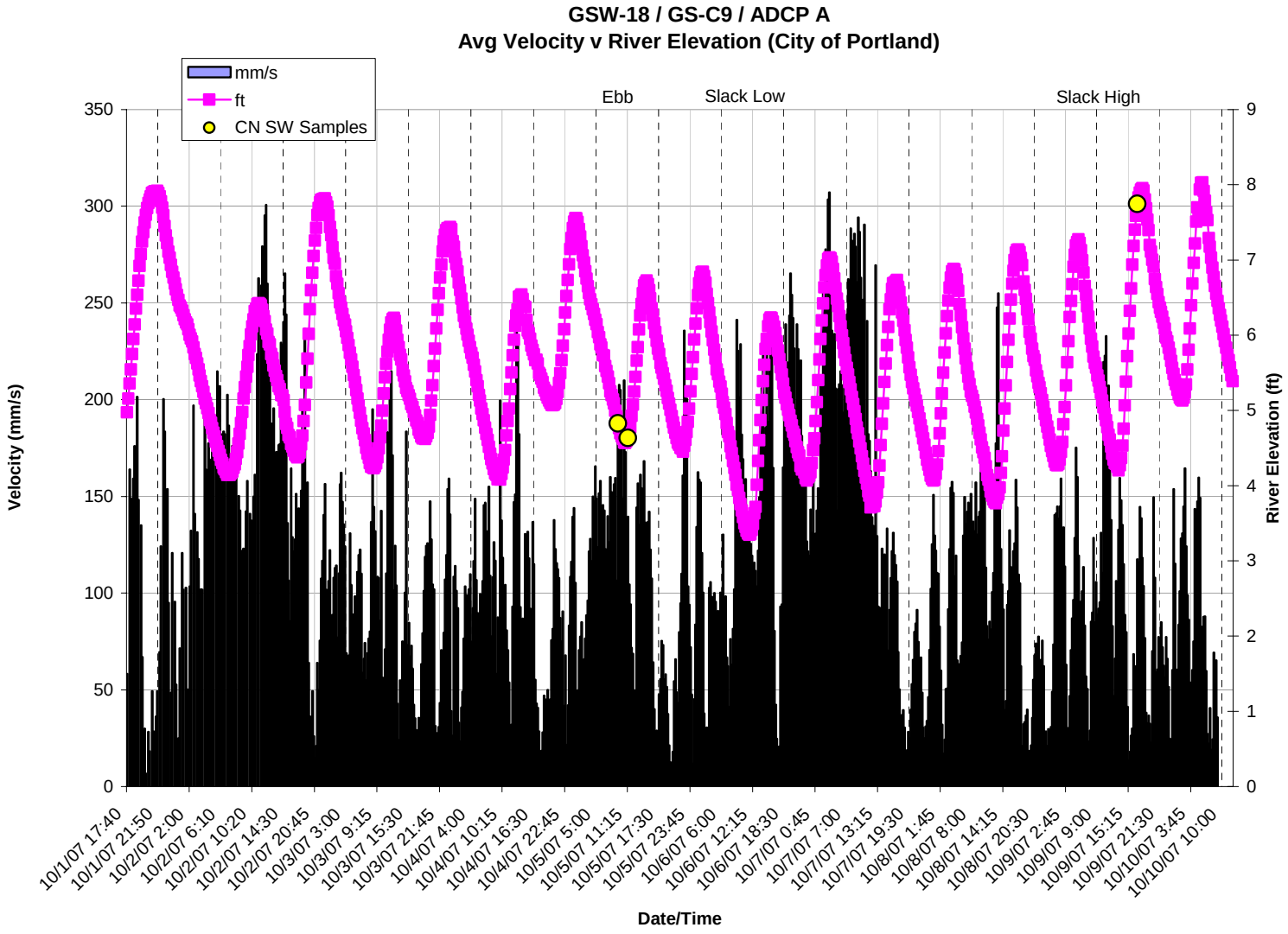
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.7b
Acoustic Doppler B: Direction v River Elevations
NW Natural – Gasco Site
Portland, Oregon



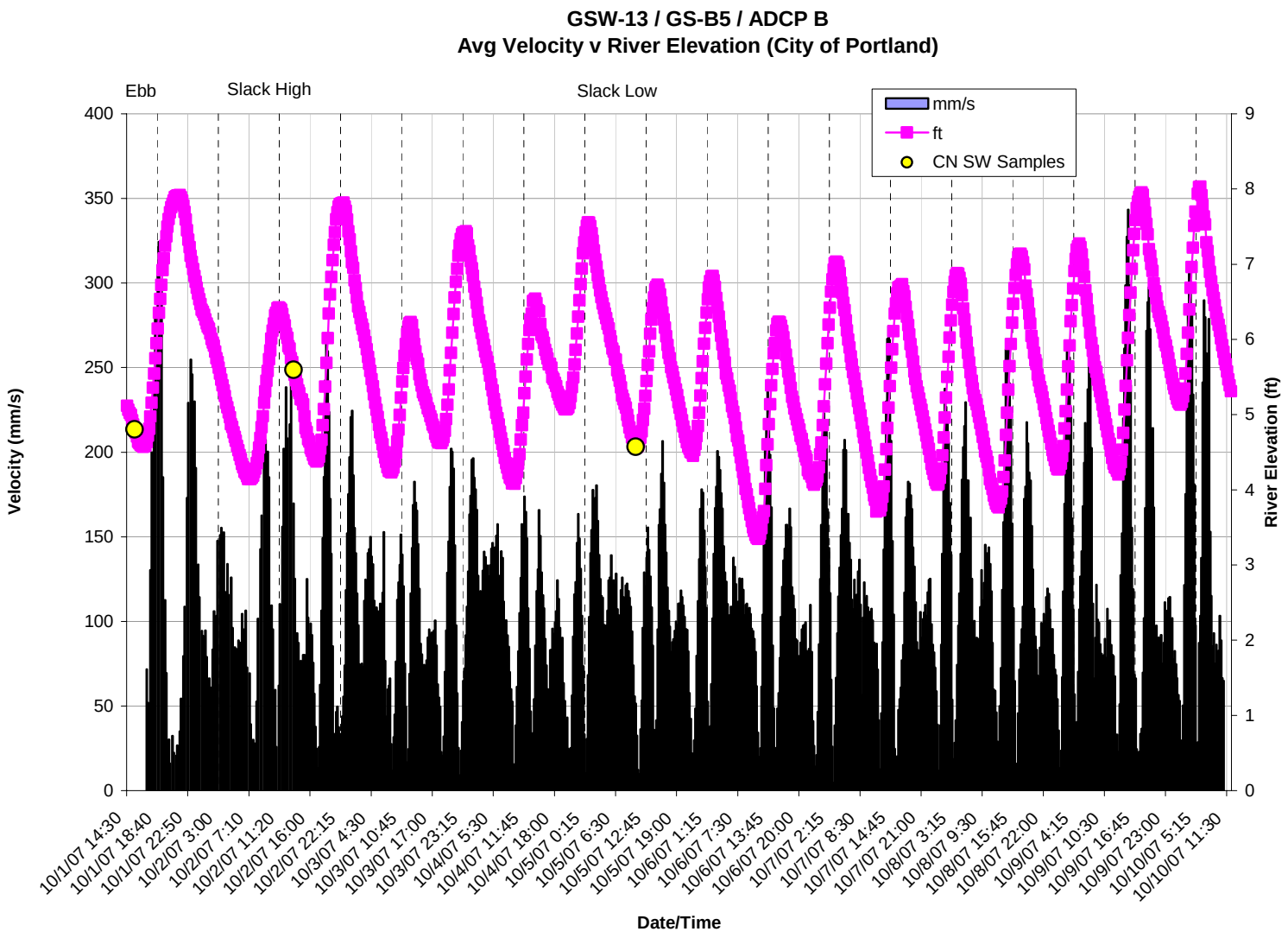
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.7c
Acoustic Doppler C: Direction v River Elevations
NW Natural – Gasco Site
Portland, Oregon



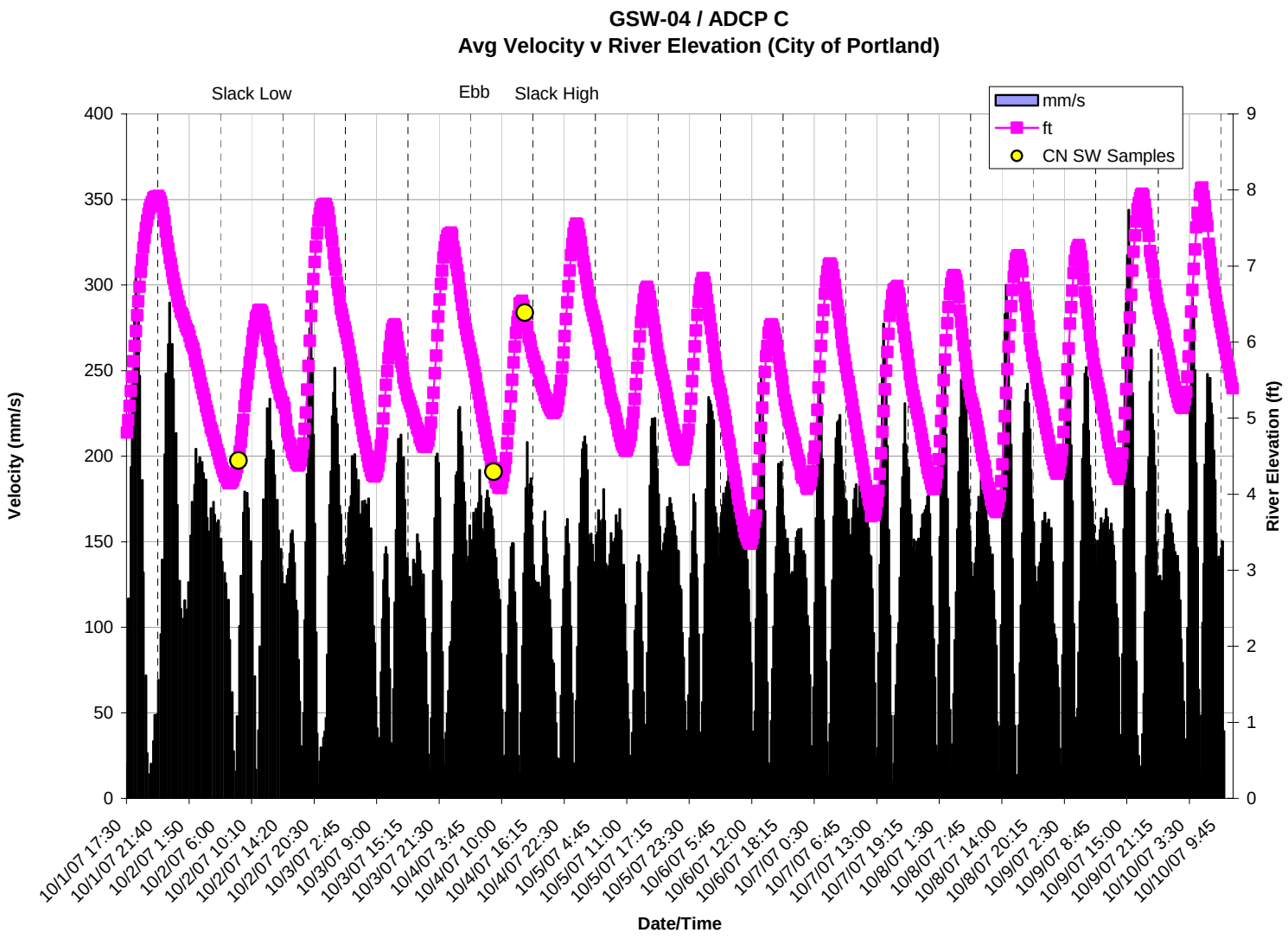
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.8a
Acoustic Doppler A: Velocity v River Elevations
NW Natural – Gasco Site
Portland, Oregon



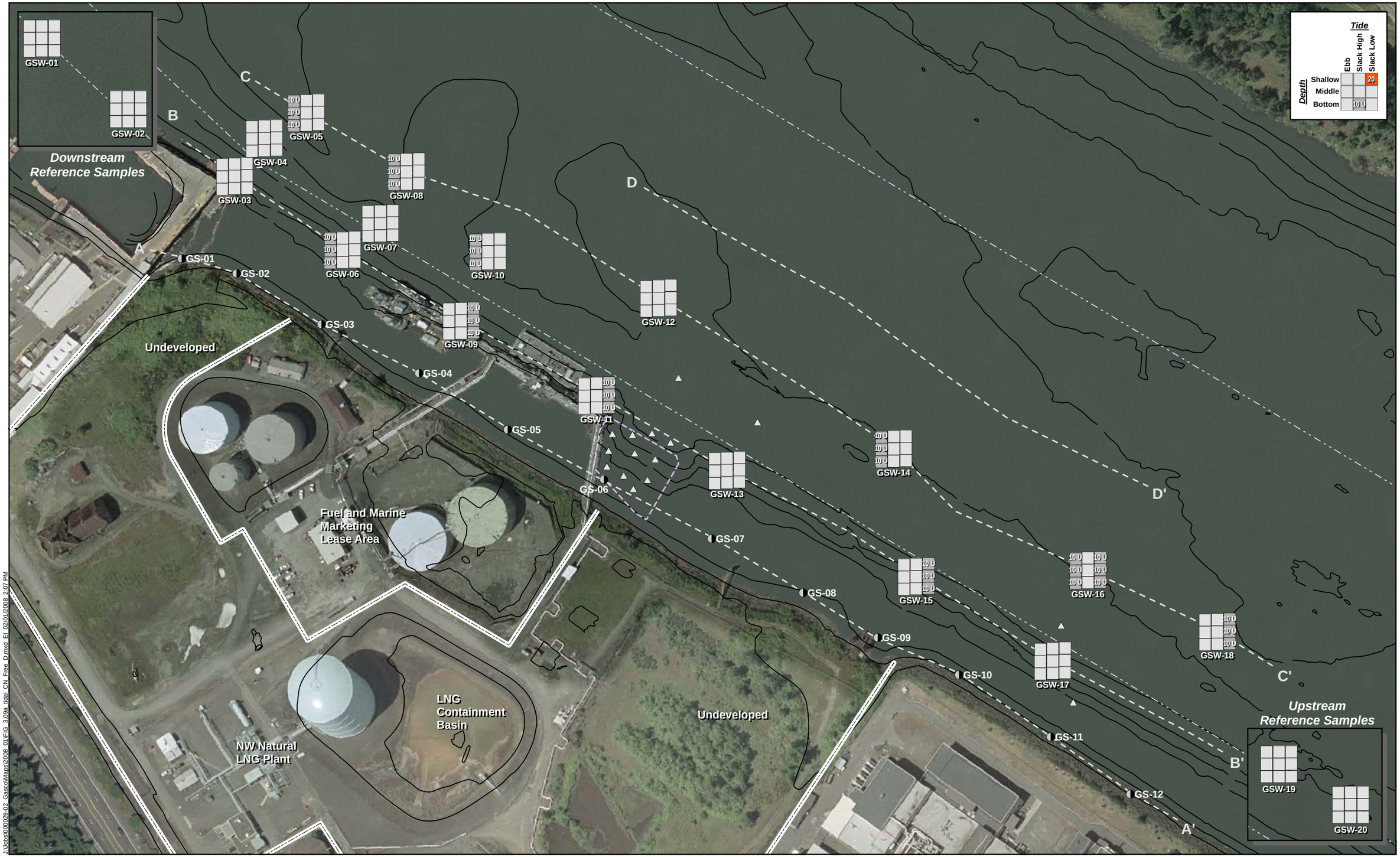
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.8b
Acoustic Doppler B: Velocity v River Elevations
NW Natural – Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.8c
Acoustic Doppler C: Velocity v River Elevations
NW Natural – Gasco Site
Portland, Oregon



J:\Jobs\000029-02_GascoMaps\2008_01\FIG_3.09a_tidal_CN_Free_D.mxd EI 02/01/2008 2:07 PM

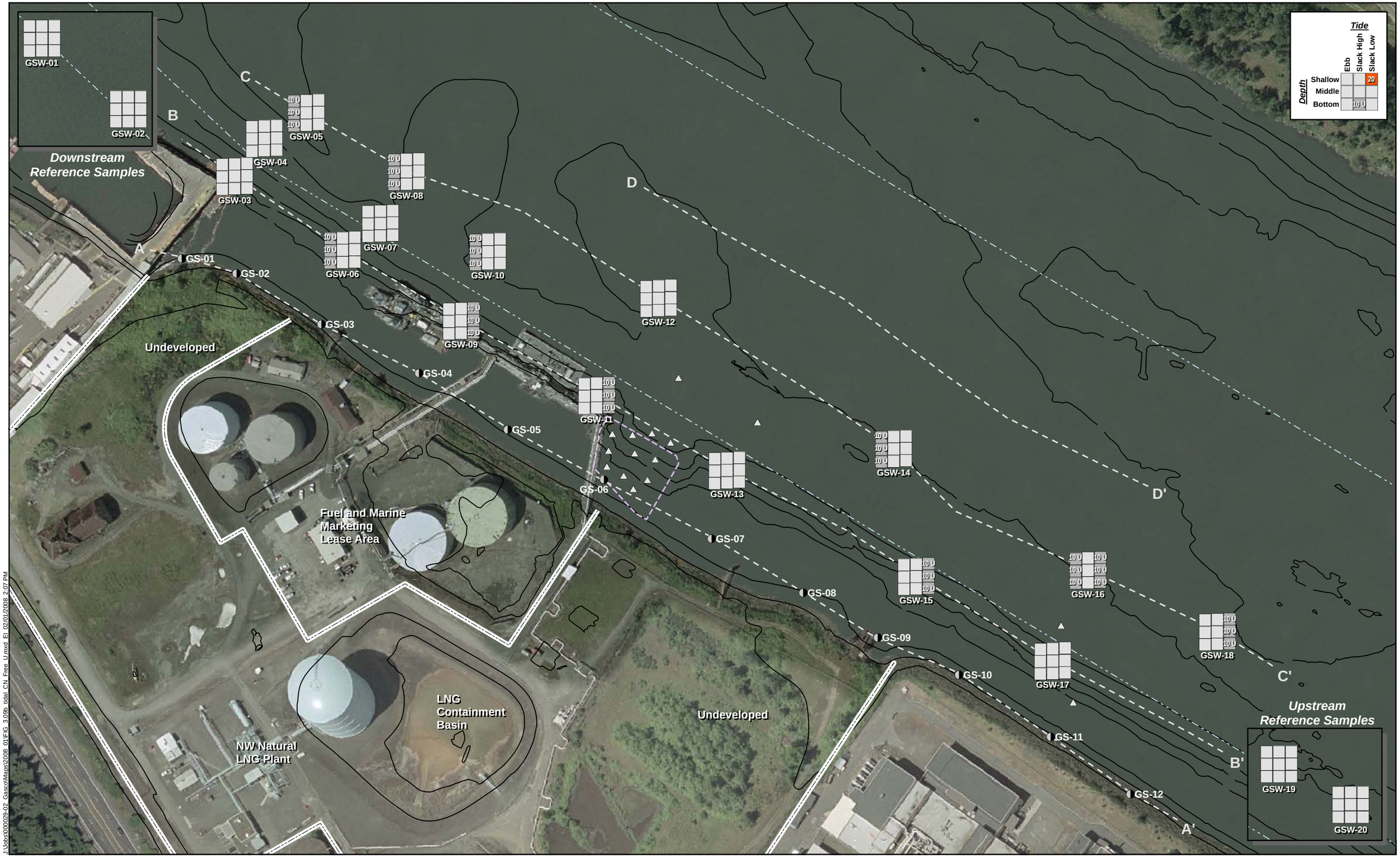
ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect, 5 µg/L MDL
Non-detect, 10 µg/L MDL
Detect, concentration (µg/L)

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.9a
Free Cyanide, Dissolved Results
NW Natural - Gasco Site
Portland, Oregon



J:\Jobs\000029-02_GascoMaps\2008_01\FIG 3.09b_tidal_CN_Free_U.mxd EI 02/01/2008 2:07 PM

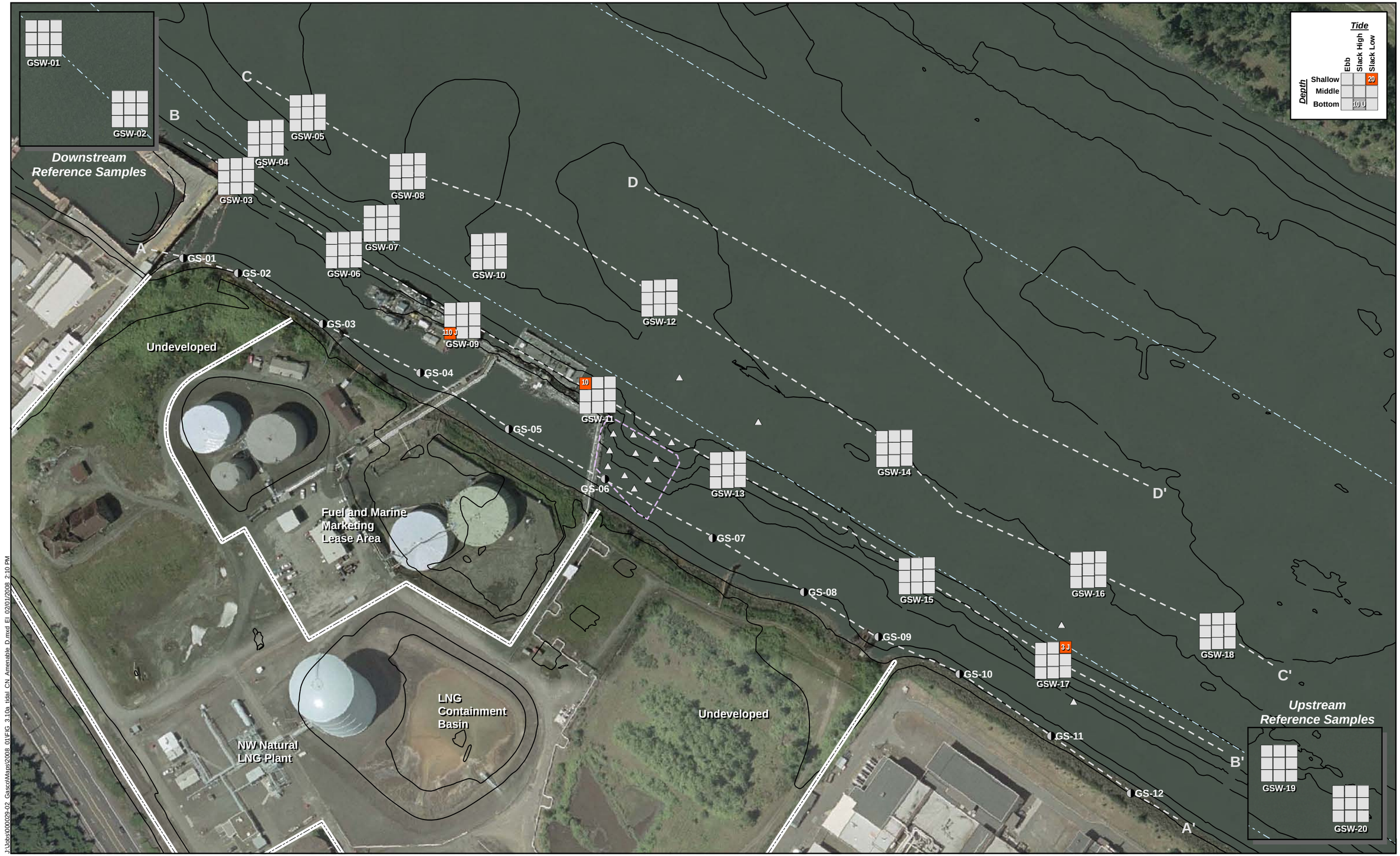
ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect, 5 µg/L MDL
Non-detect, 10 µg/L MDL
Detect, concentration (µg/L)

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.9b
Free Cyanide, Unfiltered Results
NW Natural - Gasco Site
Portland, Oregon



J:\Jobs\000029-02_GascoMaps\2008_01\FIGs 3.10a_tidal_CN_Amenable_D.mxd EI 02/01/2008 2:10 PM

ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect, 3 µg/L MDL
Non-detect, 10 µg/L MDL
Detect, concentration (µg/L)

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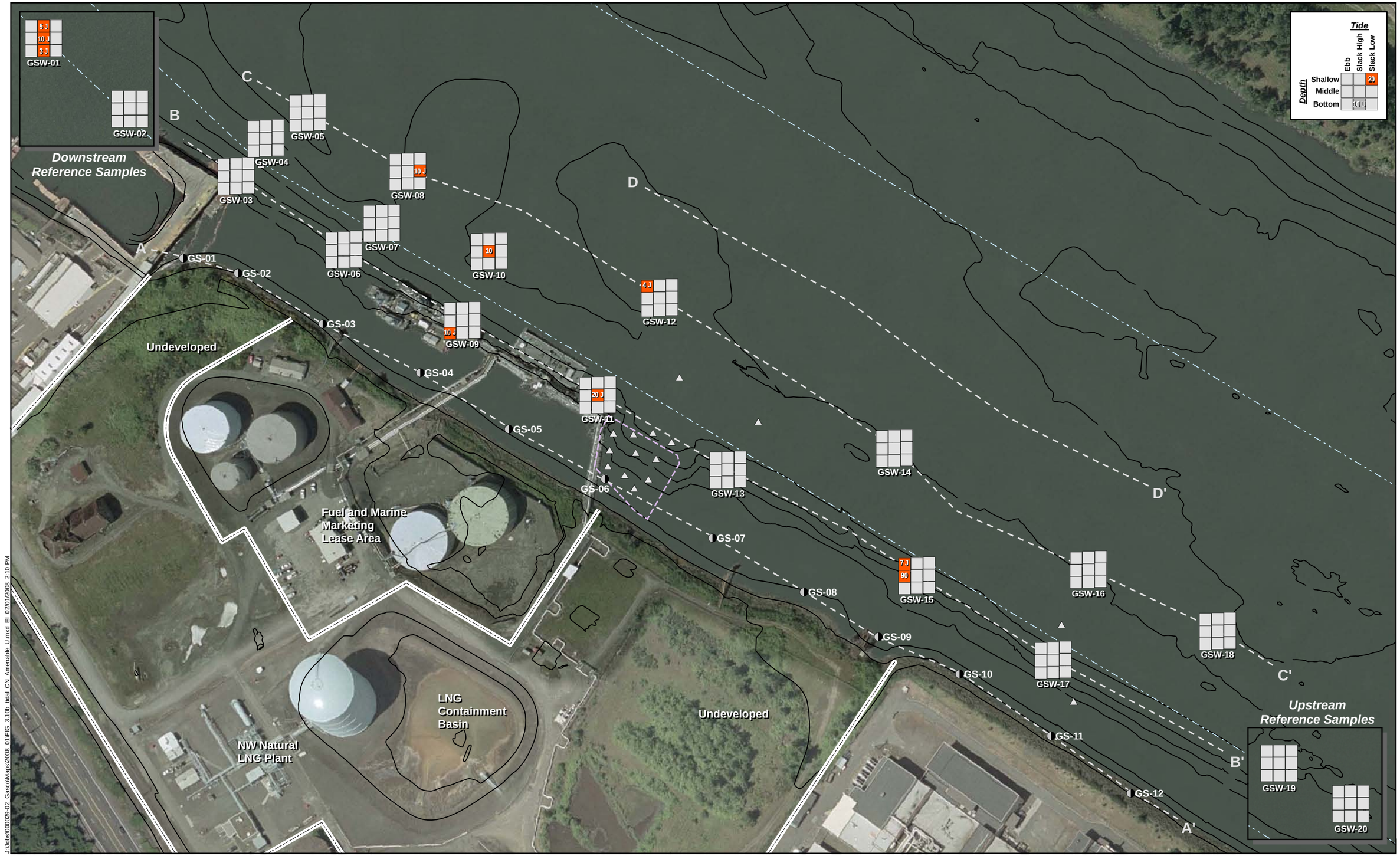
Work Product Prepared in Anticipation of Litigation

Figure 3.10a
Amenable Cyanide, Dissolved Results
NW Natural - Gasco Site
Portland, Oregon



J:\Jobs\000029-02 Gasco\Maps\2008 01\FIGS 3.10b tidal CN Amenable U.mxd EI 02/01/2008 2:10 PM

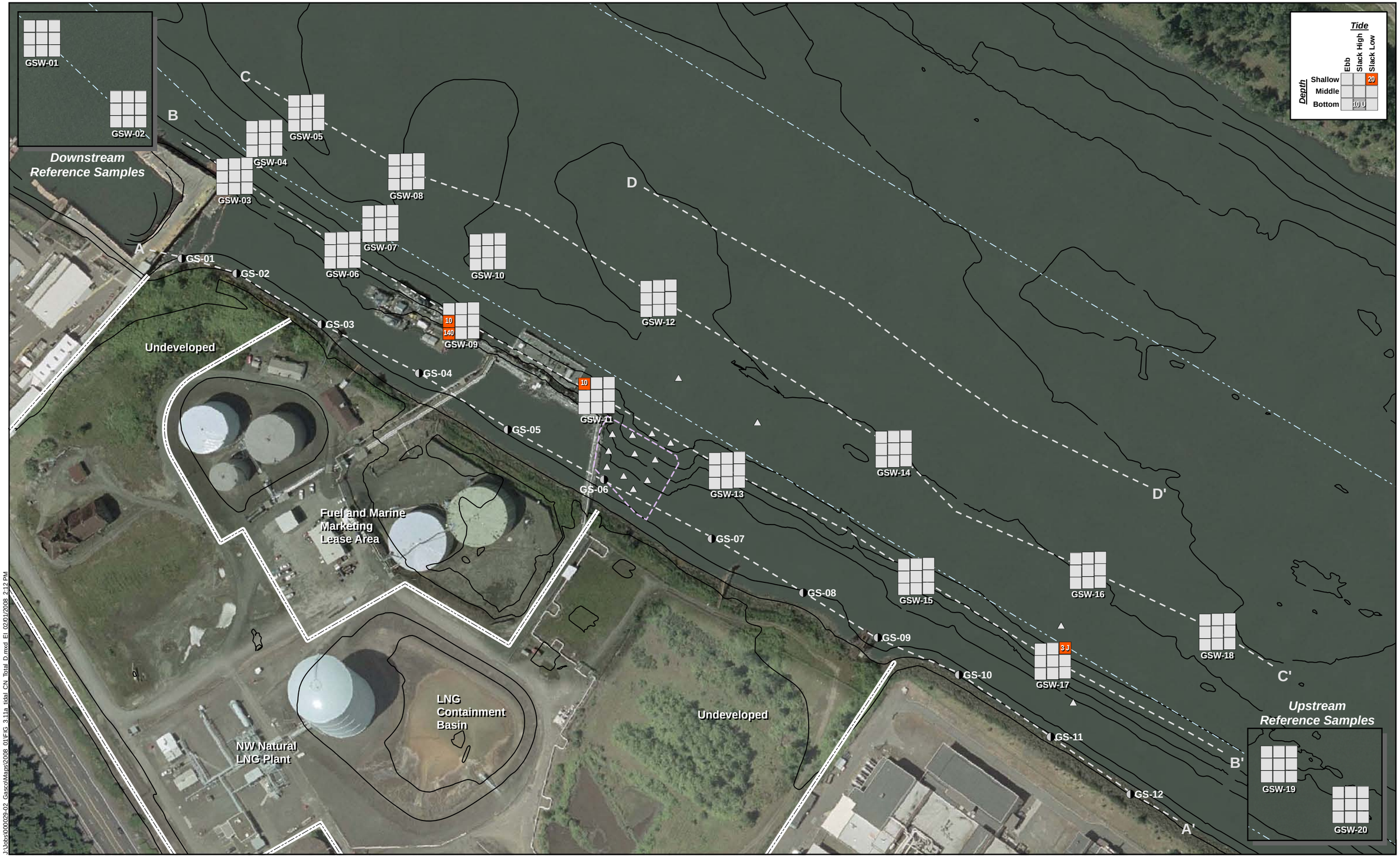
ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect, 3 µg/L MDL
Non-detect, 10 µg/L MDL
Detect, concentration (µg/L)

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.10b
Amenable Cyanide, Unfiltered Results
NW Natural - Gasco Site
Portland, Oregon



J:\Jobs\000029-02 Gasco\Maps\2008 01\FIG 3.11a tidal CN Total D.mxd EI 02/01/2008 2:12 PM

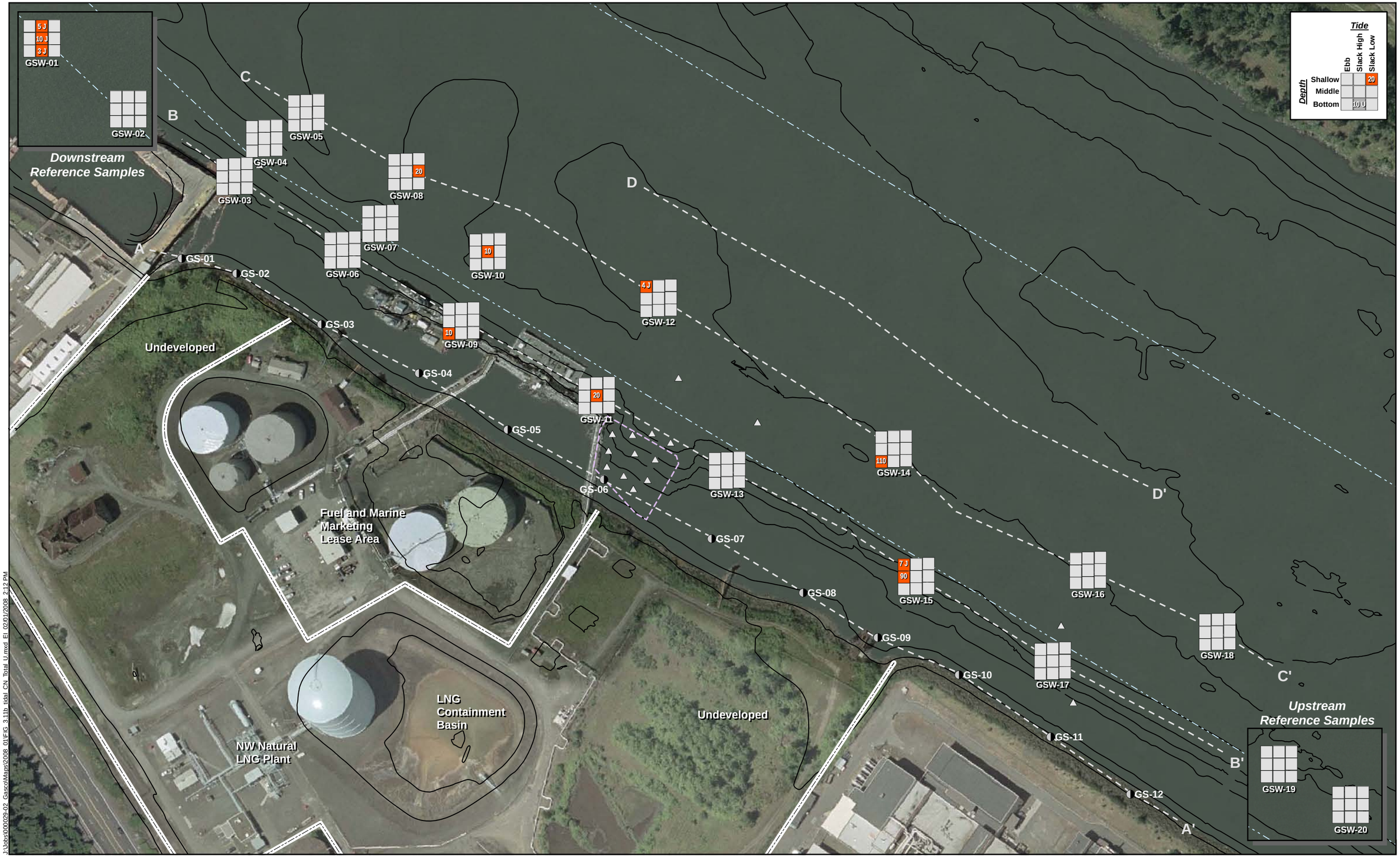
ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect, 3 µg/L MDL
Non-detect, 10 µg/L MDL
Detect, concentration (µg/L)

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.11a
Total Cyanide, Dissolved Results
NW Natural - Gasco Site
Portland, Oregon



J:\Jobs\000029-02_GascoMaps\2008_01\FIG_3.11b_tidal_CN_Total_U.mxd EI 02/01/2008 2:12 PM

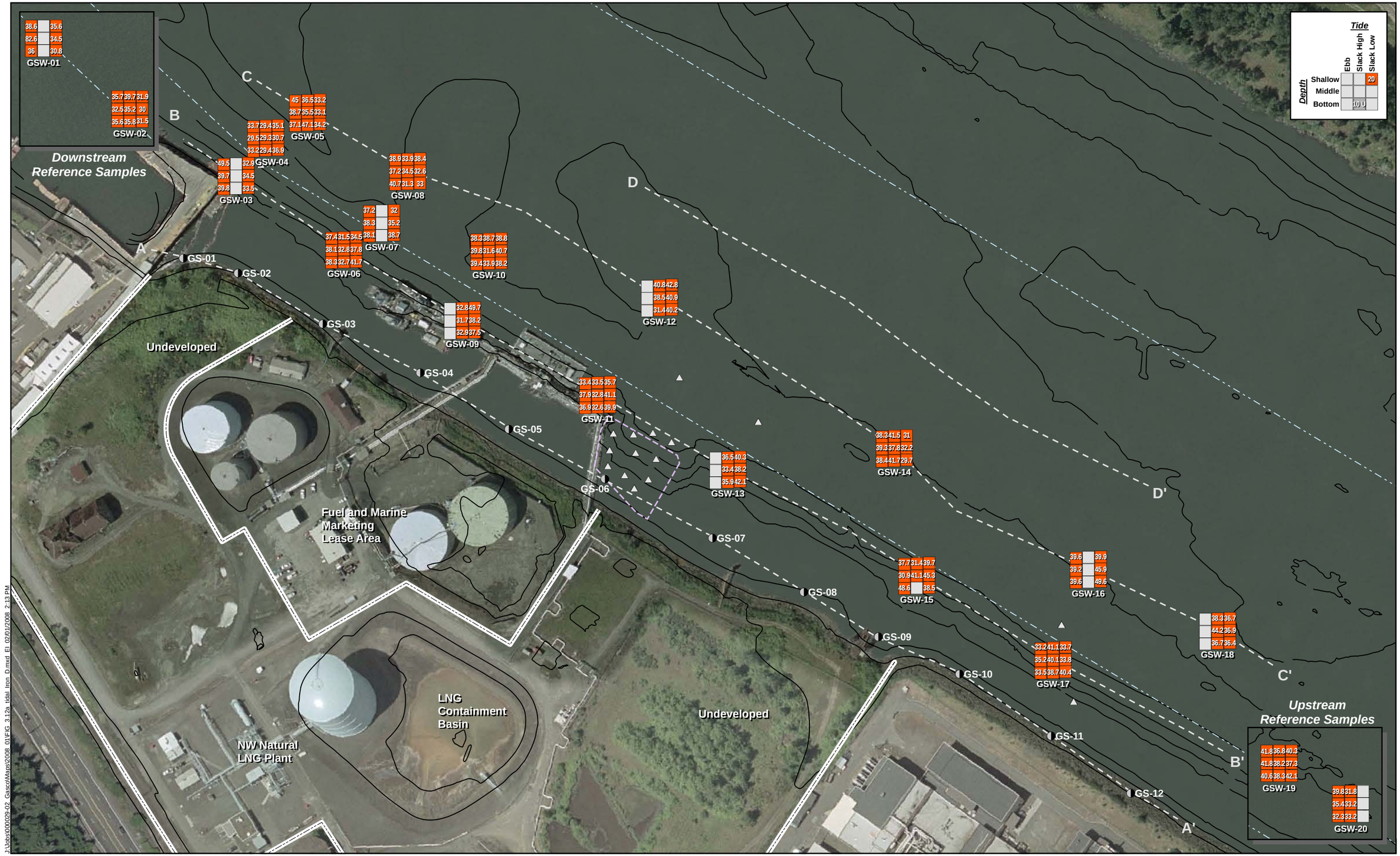
ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect, 3 µg/L MDL
Non-detect, 10 µg/L MDL
Detect, concentration (µg/L)

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.11b
Total Cyanide, Unfiltered Results
NW Natural - Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

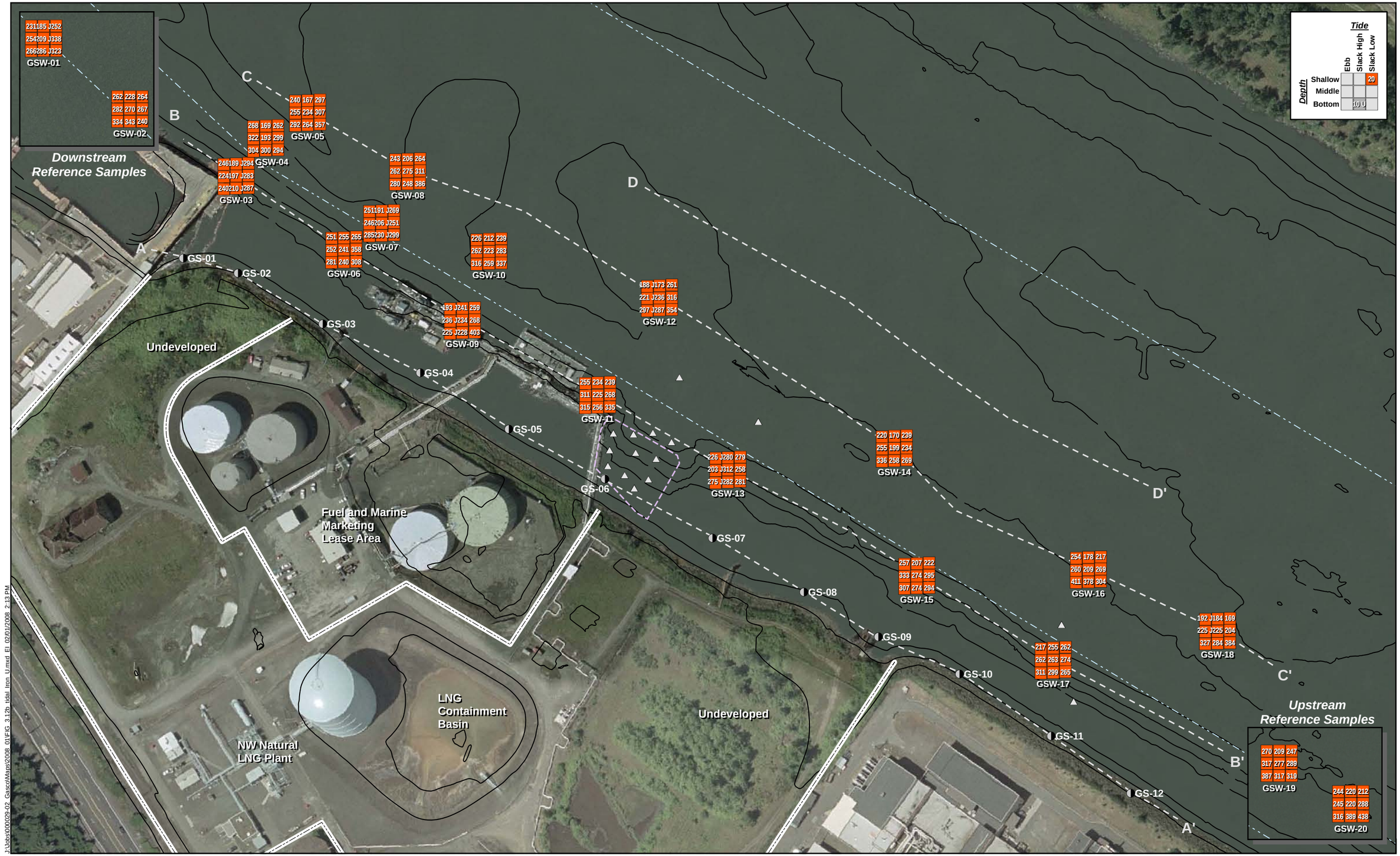
0 175
Scale in Feet
1 inch equals 175 feet

Non-detect
Detect, concentration (µg/L)

Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.12a
Iron, Dissolved Results
NW Natural - Gasco Site
Portland, Oregon

J:\Jobs\000029-02_GascoMaps\2008_01\FIG_3.12a_tidal_Iron_D.mxd El 02/01/2008 2:13 PM



J:\Jobs\000029-02_GascoMaps\2008_01\FIG 3.12b_tidal_Iron_U.mxd EI 02/01/2008 2:13 PM

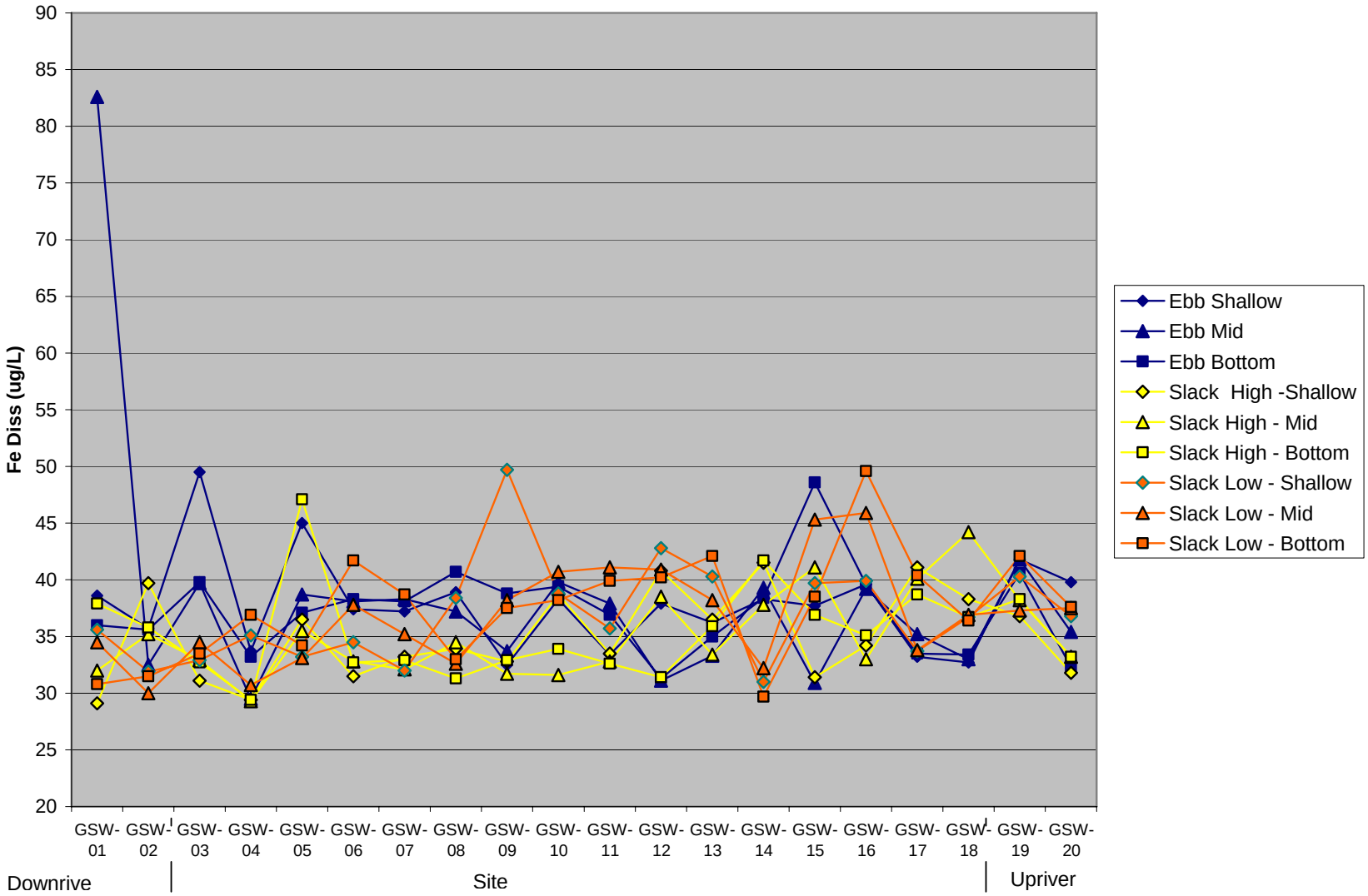
ANCHOR ENVIRONMENTAL, L.L.C.

0 175
Scale in Feet
1 inch equals 175 feet

Non-detect
Detect, concentration (µg/L)

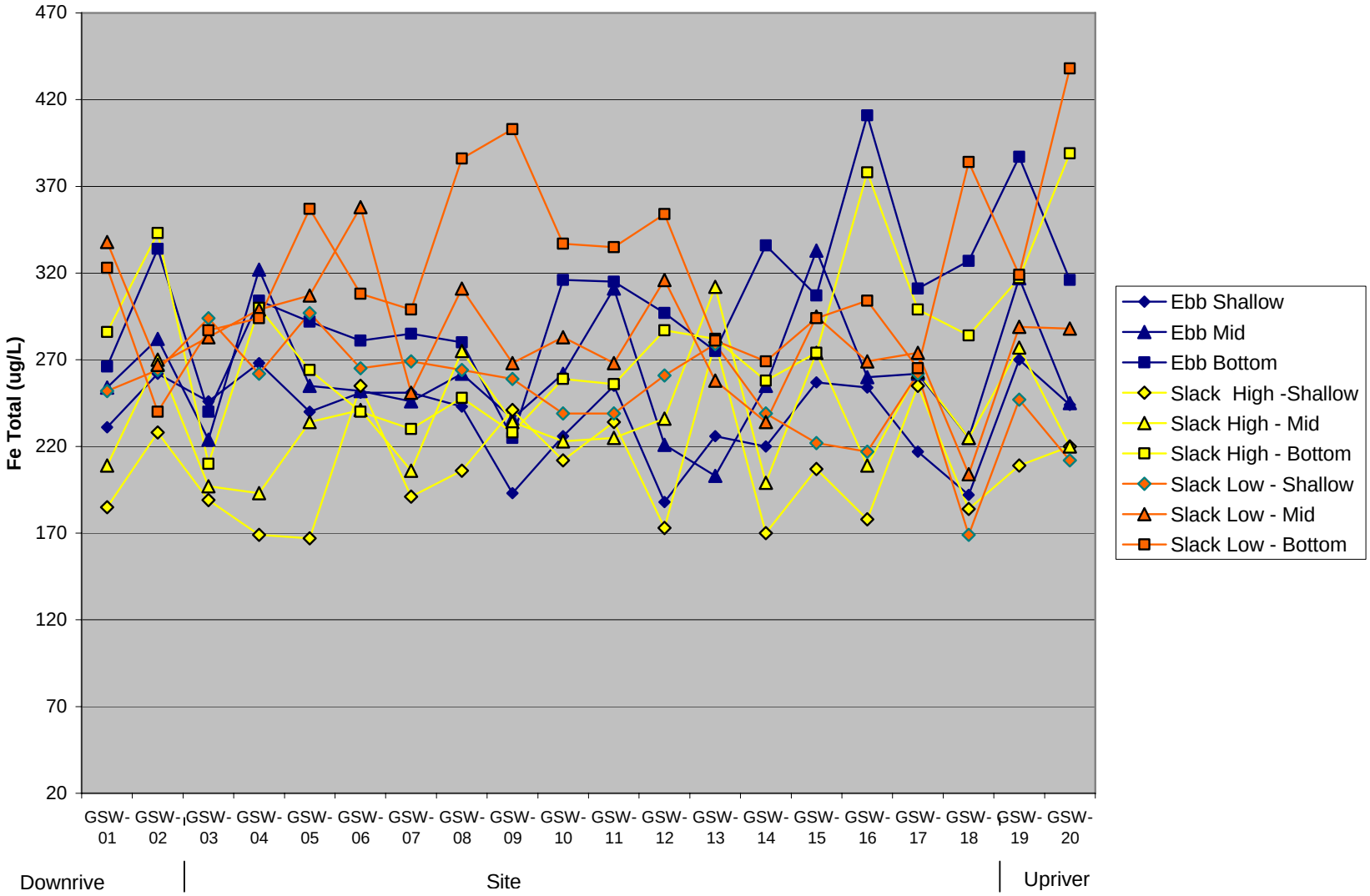
Attorney Client Privileged and Confidential
Work Product Prepared in Anticipation of Litigation

Figure 3.12b
Iron, Unfiltered Results
NW Natural - Gasco Site
Portland, Oregon



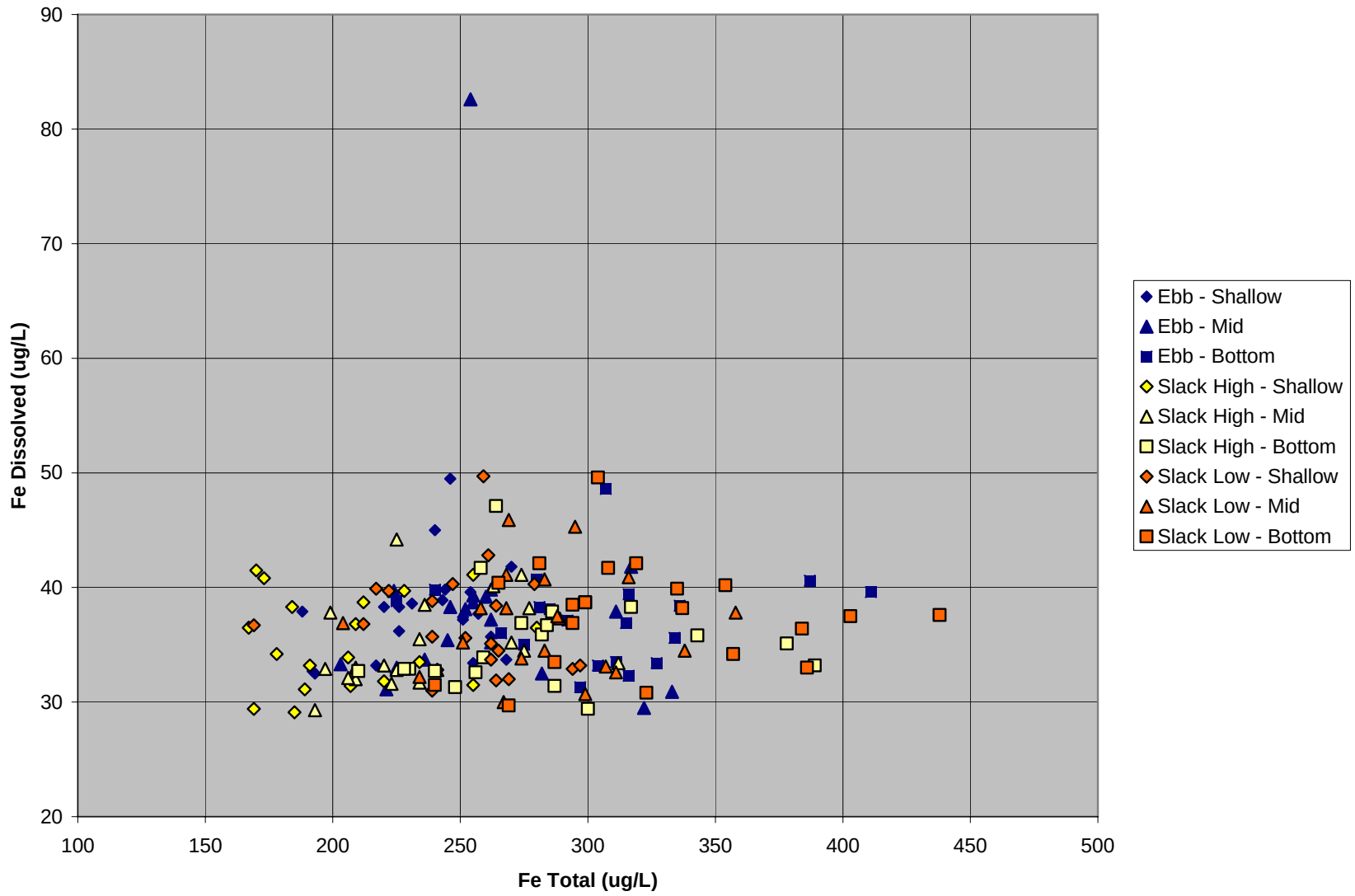
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.13
Dissolved Iron Results by Sampling Event
NW Natural – Gasco Site
Portland, Oregon



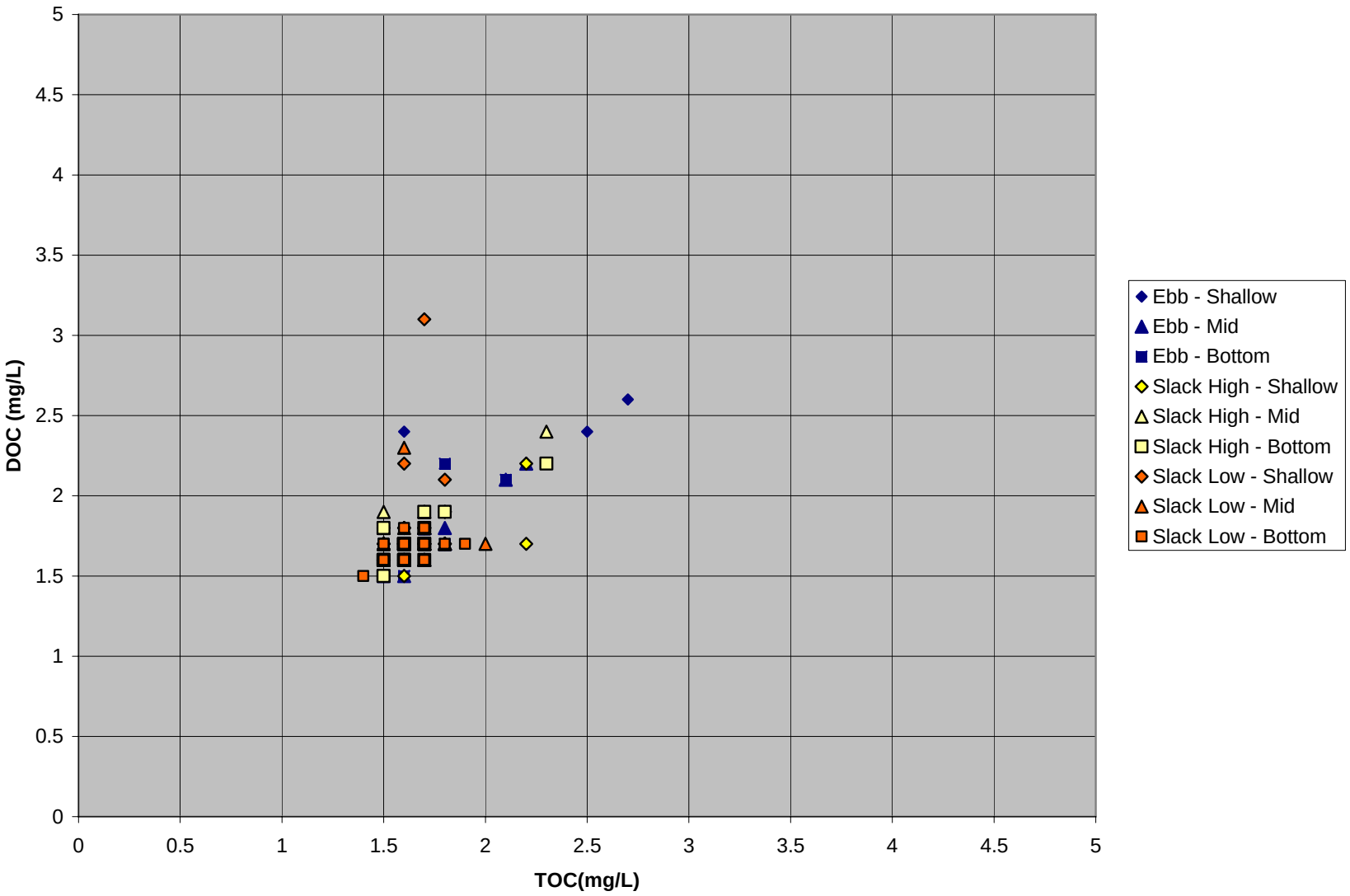
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.14
Total Iron Results by Sampling Event
NW Natural – Gasco Site
Portland, Oregon



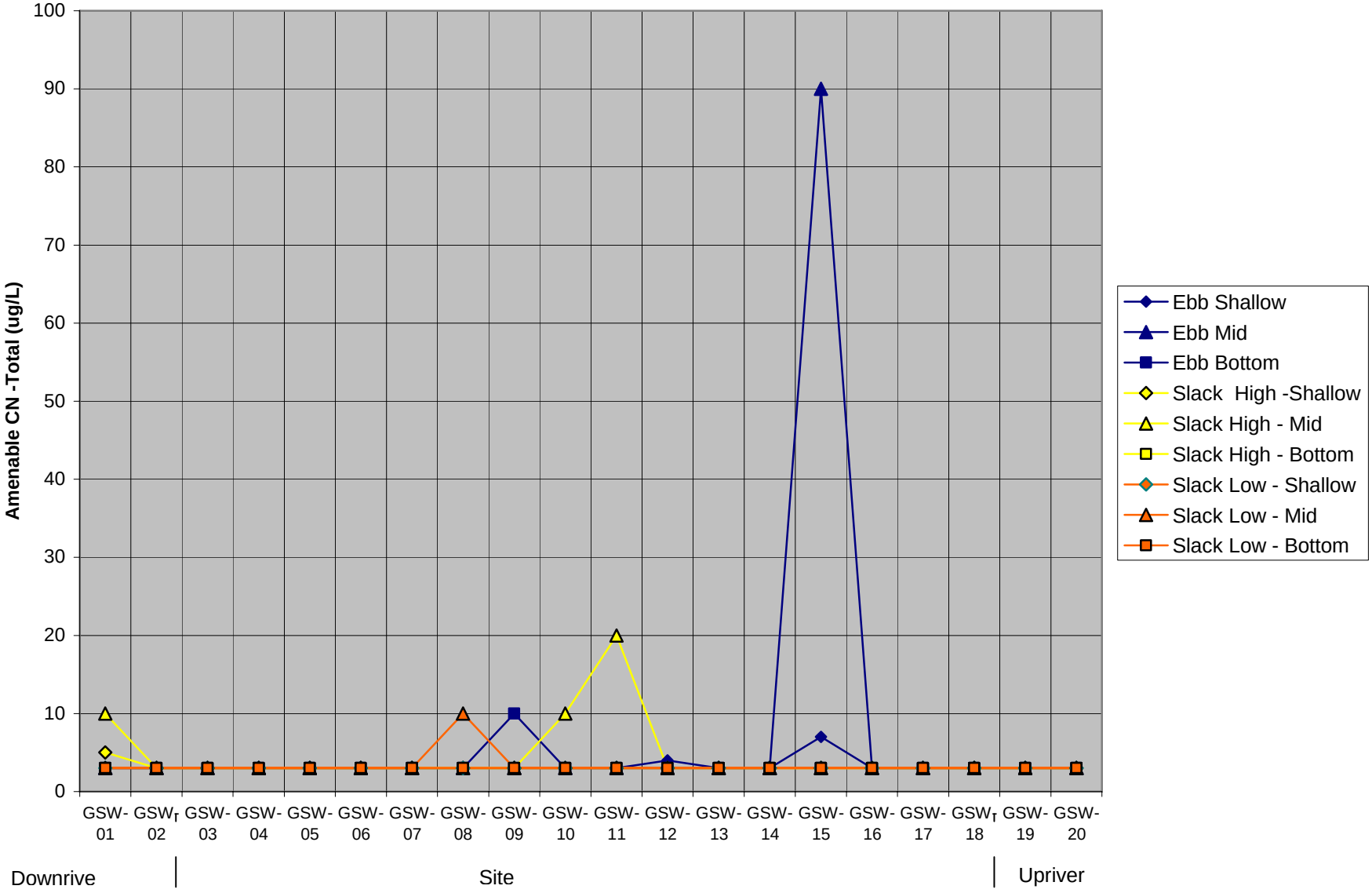
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.15
Dissolved versus Total Iron
NW Natural – Gasco Site
Portland, Oregon



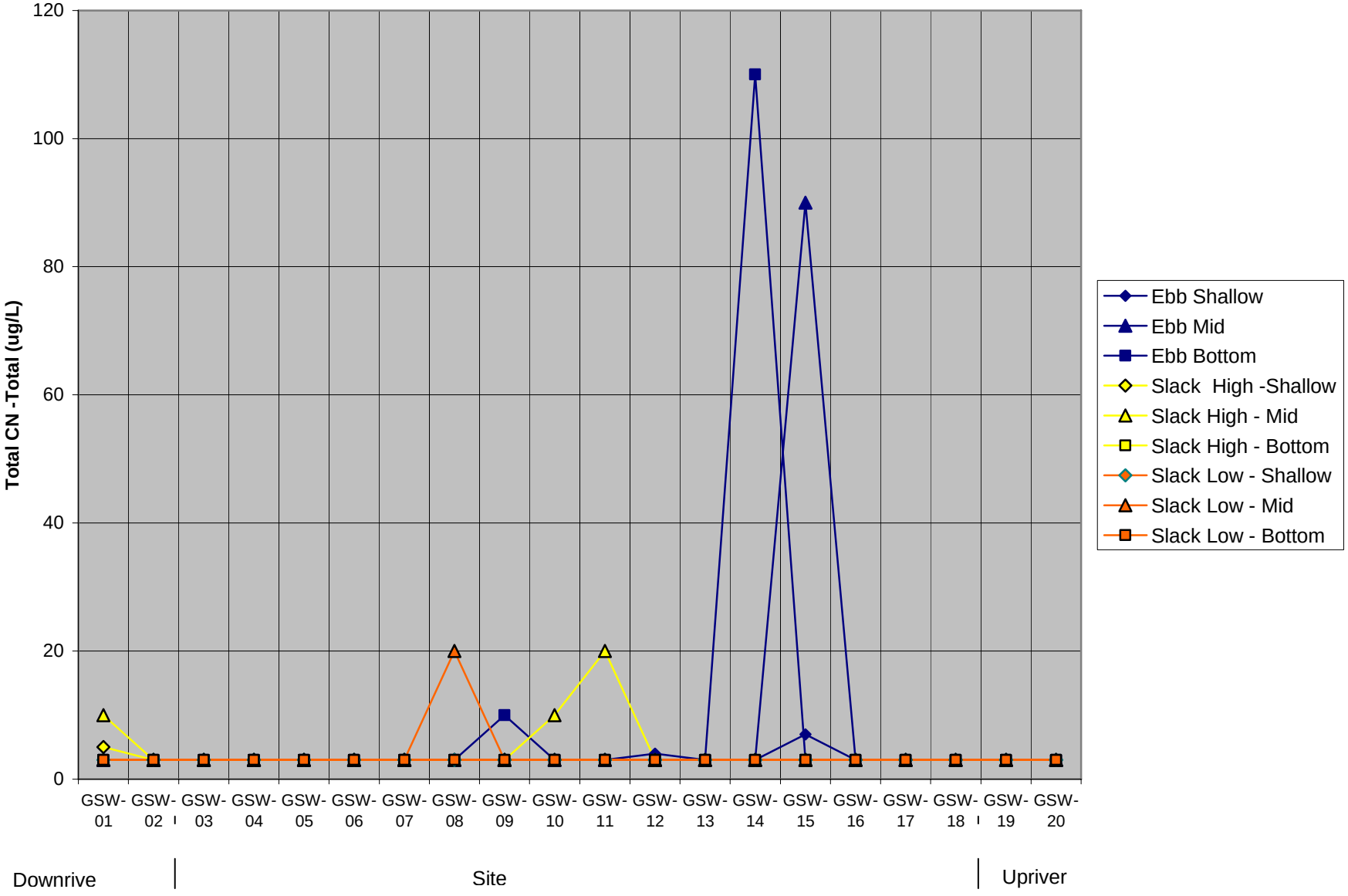
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.16
Dissolved versus Total Organic Carbon
NW Natural – Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.17
Amenable Cyanide (Unfiltered) Results by Sampling Event
NW Natural – Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.18
Total Cyanide (Unfiltered) Results by Sampling Event
NW Natural – Gasco Site
Portland, Oregon

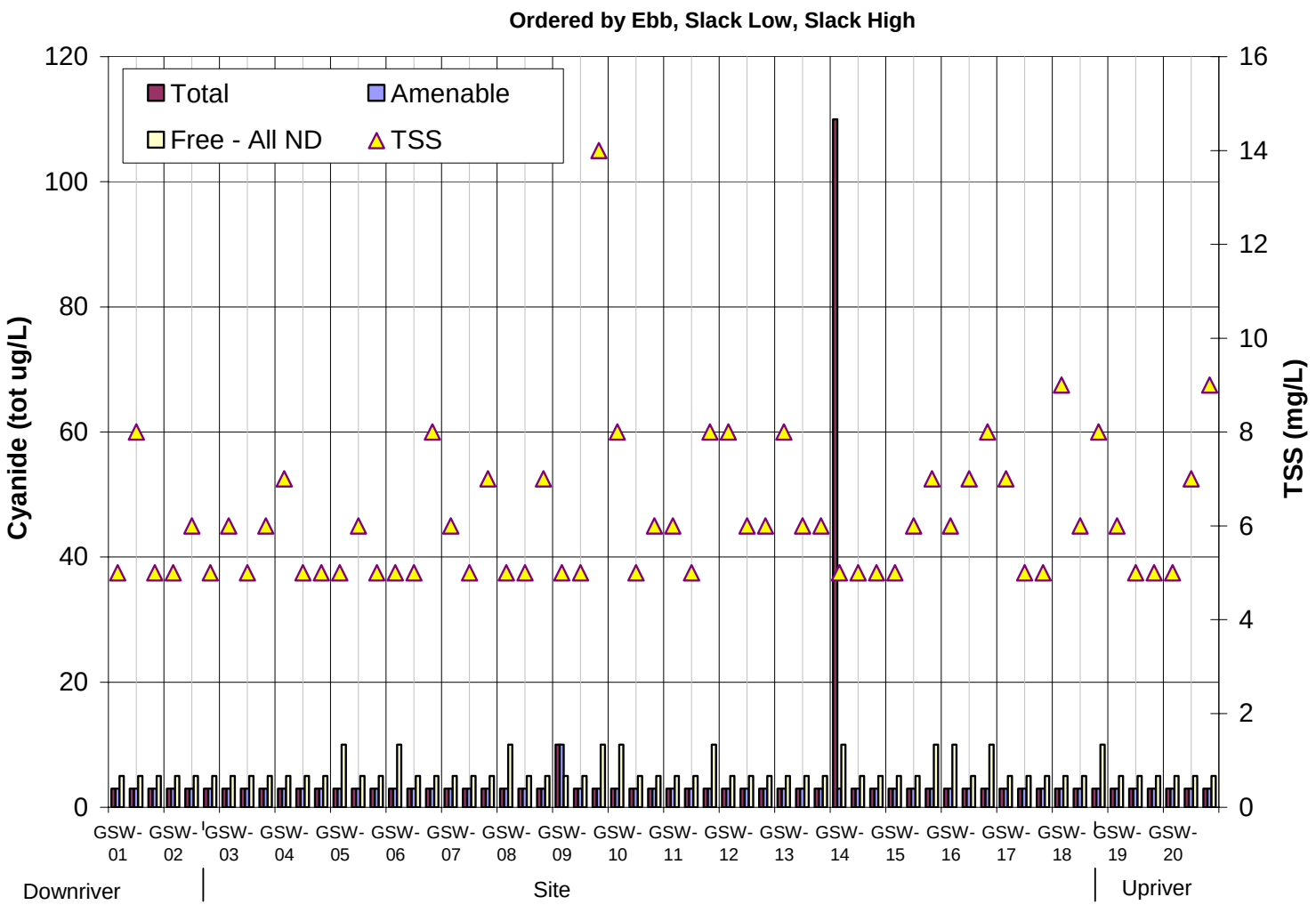
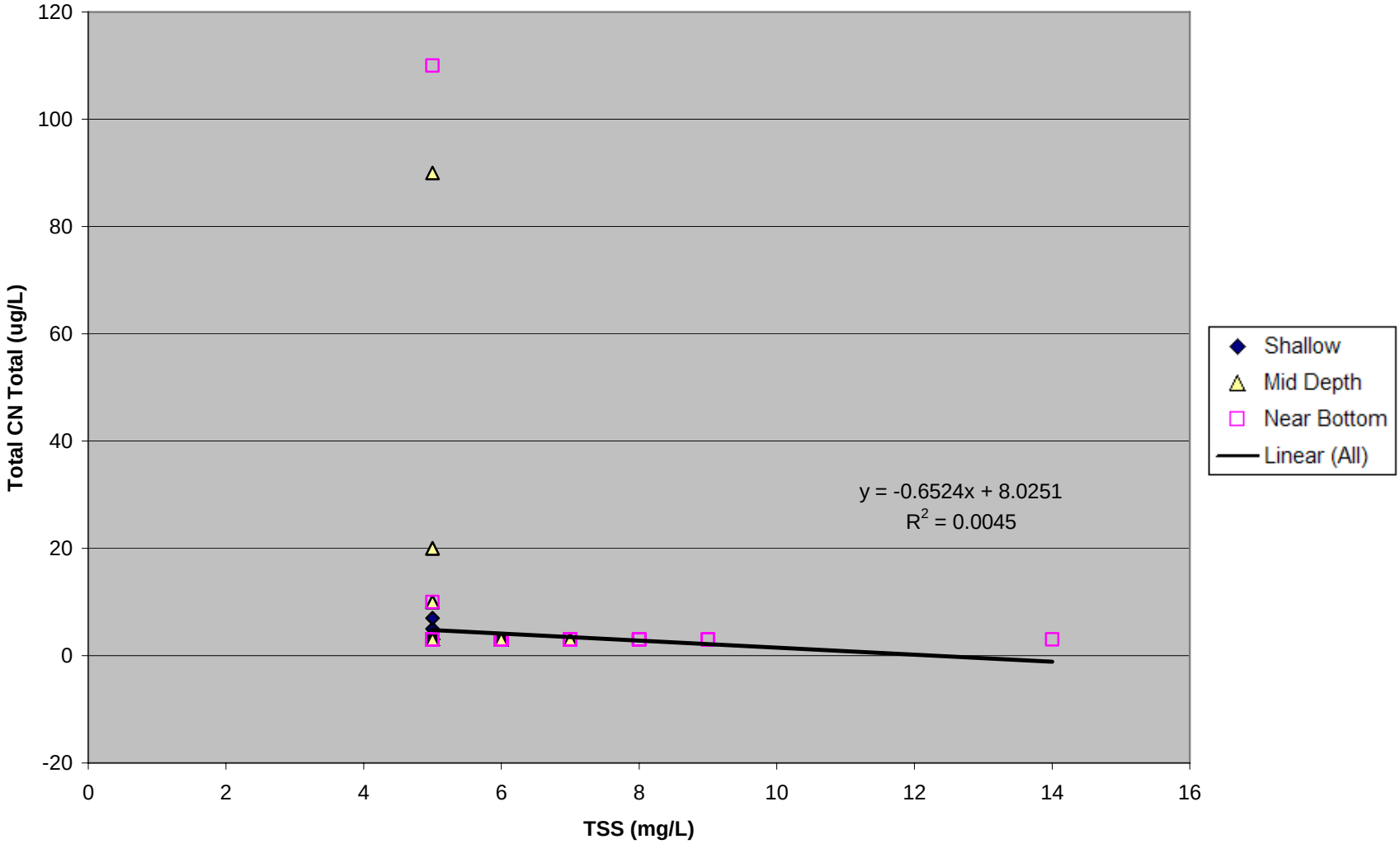
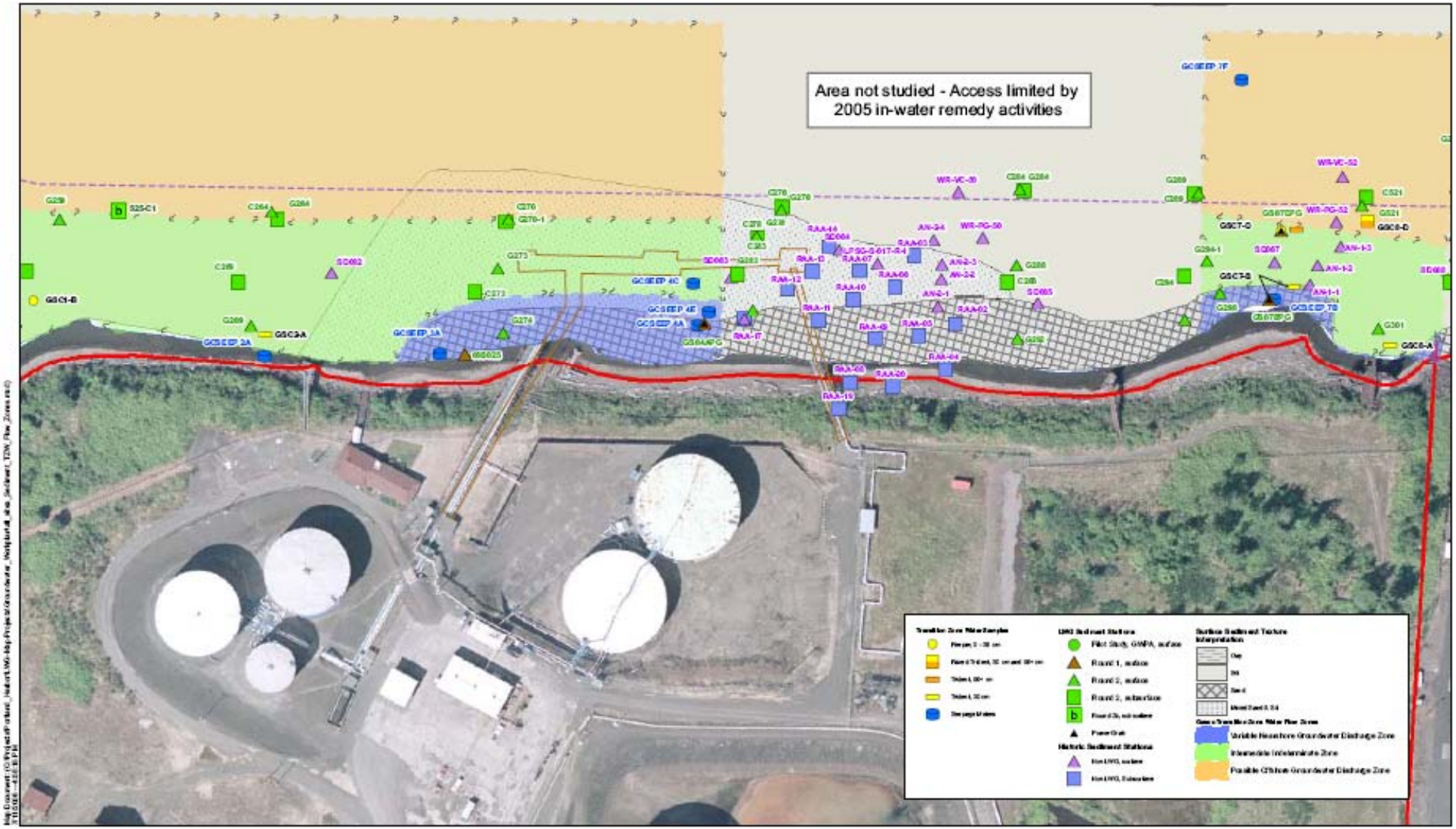


Figure 3.19
TSS versus Unfiltered Cyanide Results from Near Bottom Samples
NW Natural – Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3.20
Regression of TSS versus Unfiltered Total Cyanide
NW Natural – Gasco Site
Portland, Oregon

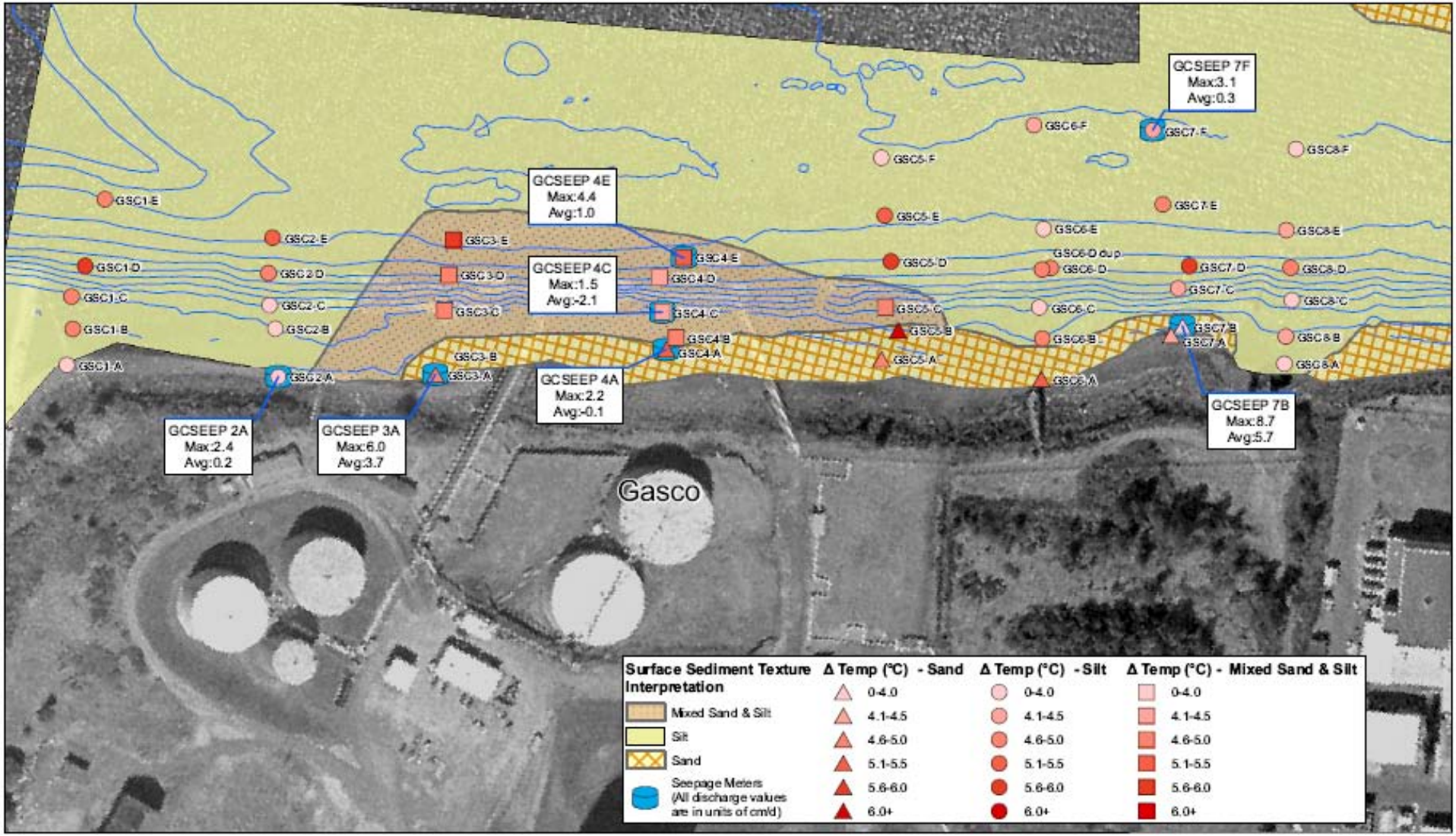


Source: Figure 7-7 from the Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Site Characterization Summary Report (Integral 2006)

Note: Seepage meter station GCSEEP 4E is shown in the incorrect location on this figure. The correct location is shown on Figure 4.2.

ANCHOR ENVIRONMENTAL, L.L.C.

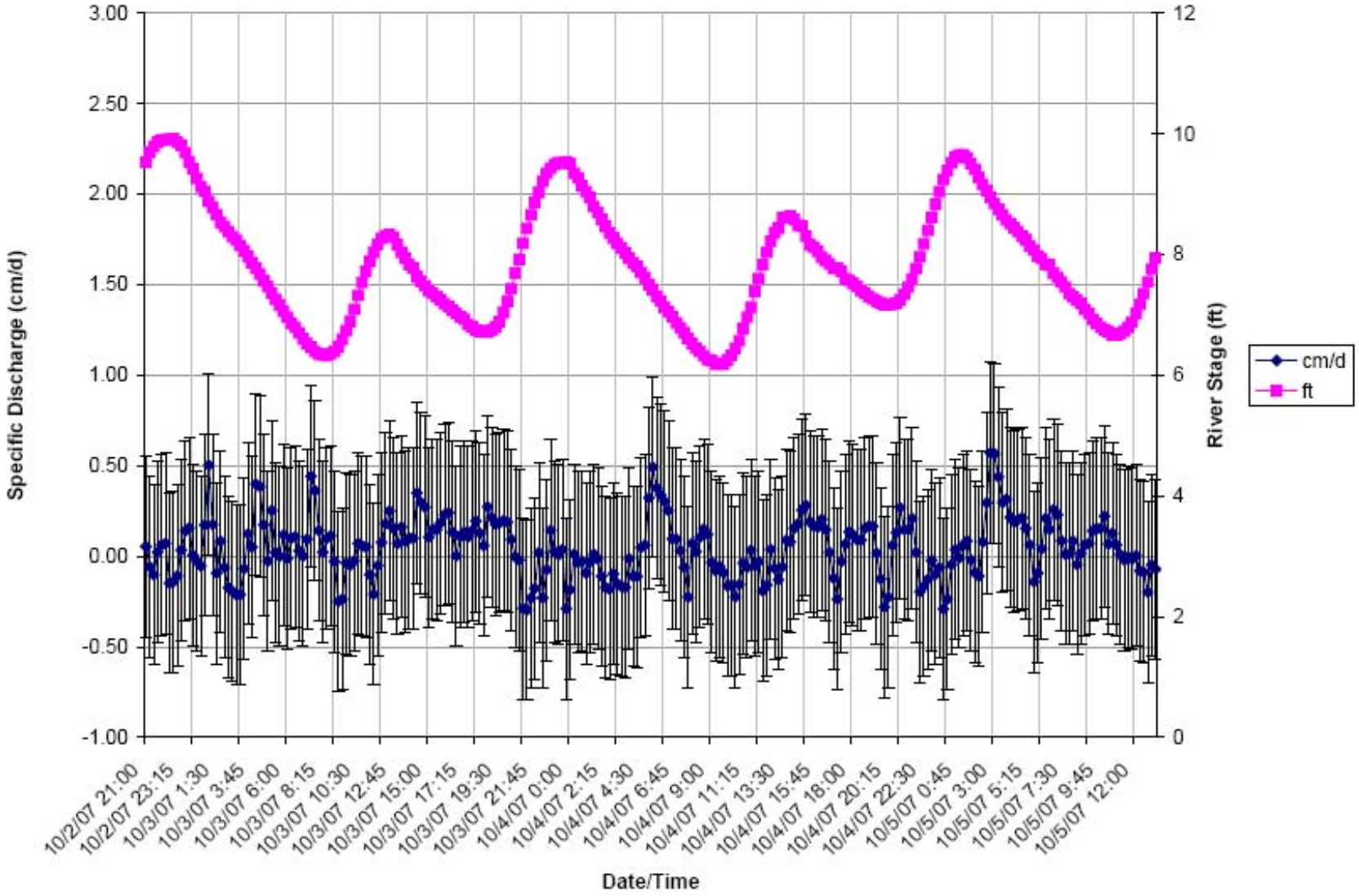
Figure 4.1
LWG Groundwater Discharge Monitoring Stations – Gasco Site
NW Natural – Gasco Site
Portland, Oregon



Source: Figure 7-7 from the Portland Harbor RI/FS Round 2 Groundwater Pathway Assessment Site Characterization Summary Report (Integral, 2006)

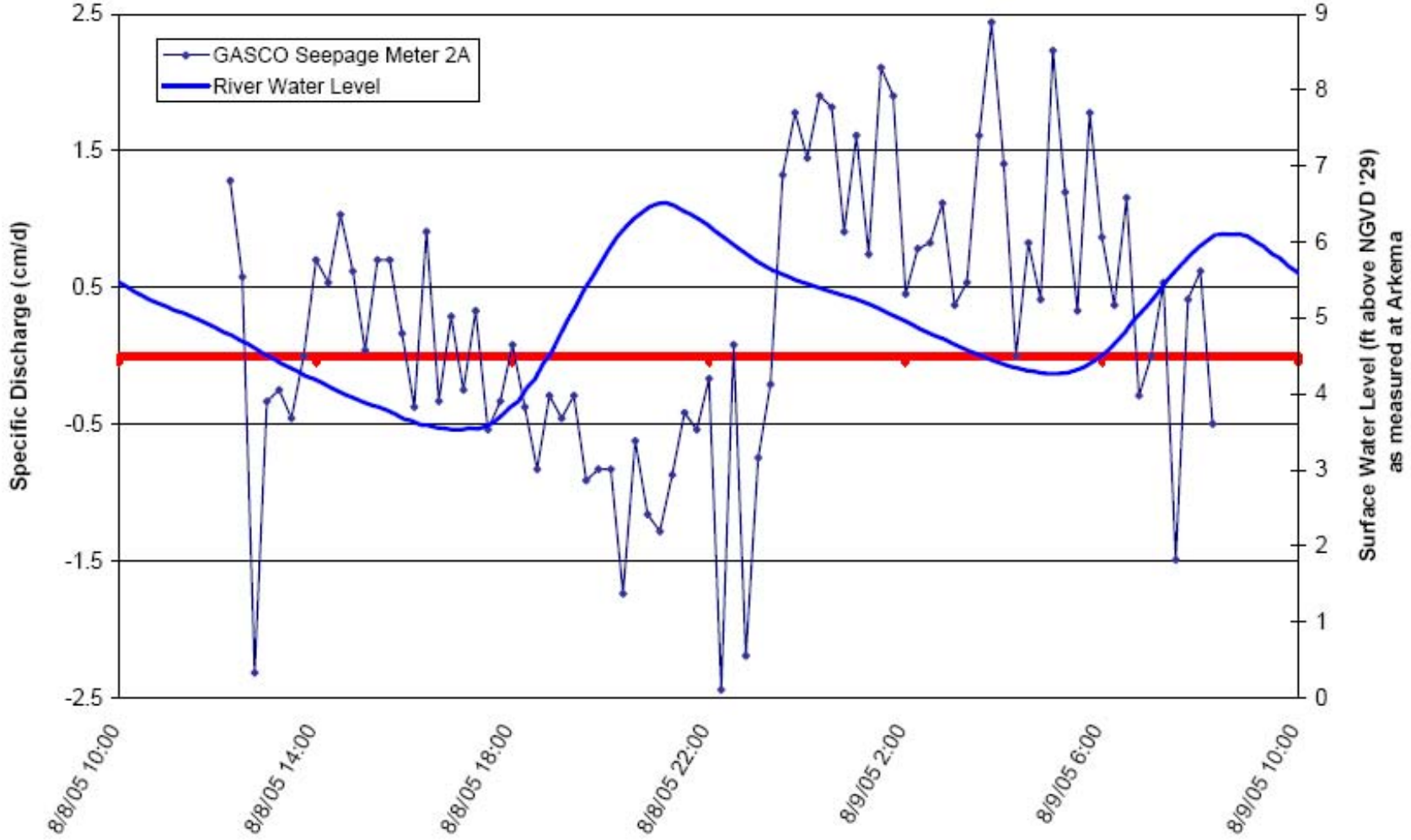
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4.2
Summary of LWG Investigation Groundwater Discharge – Gasco Site
NW Natural – Gasco Site
Portland, Oregon



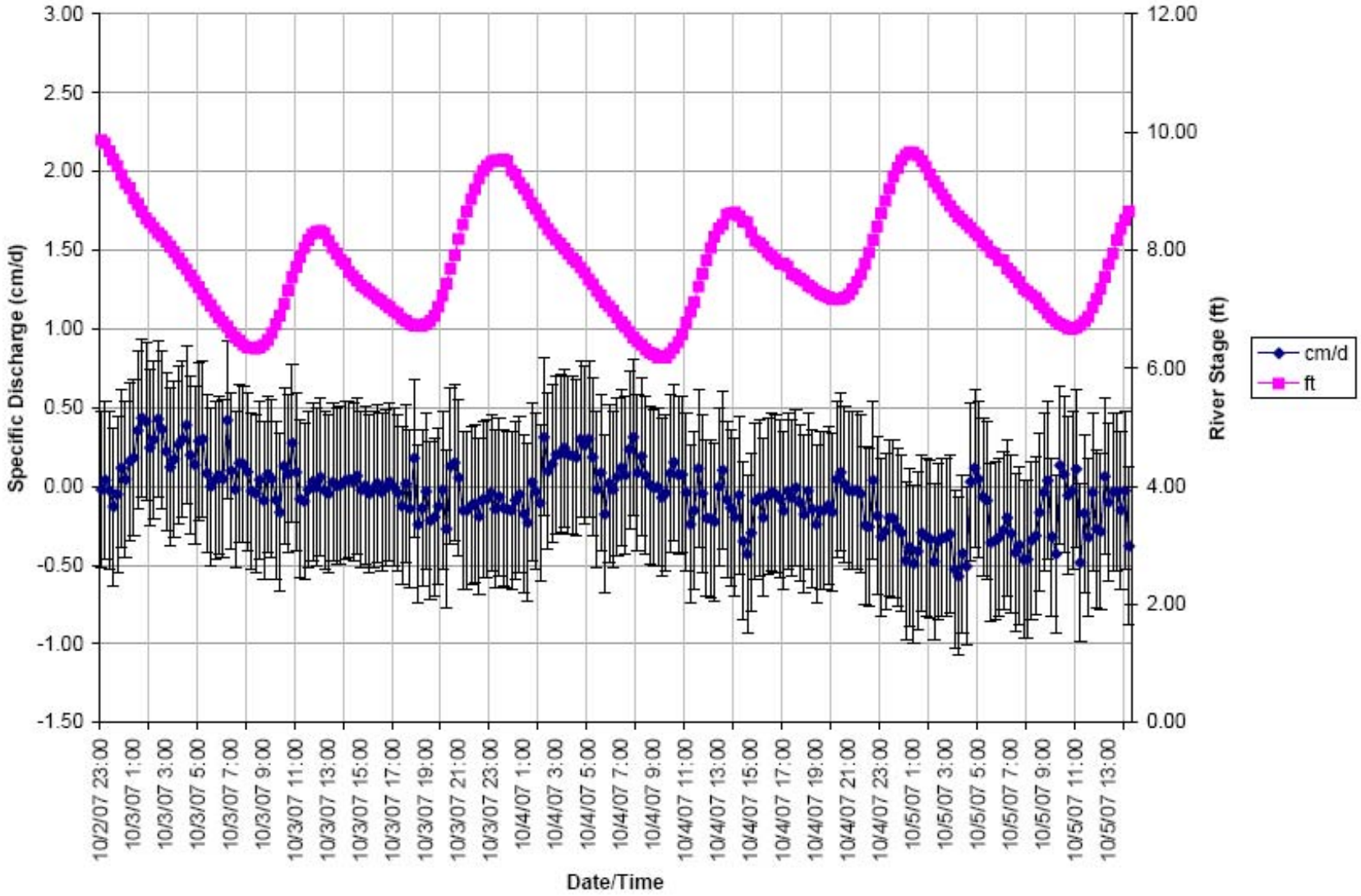
ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4.3
Monitoring Station GS-B2 Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4.4
LWG Monitoring Station GCSEEP-2A Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon



ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4.5
Monitoring Station GS-B7 Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

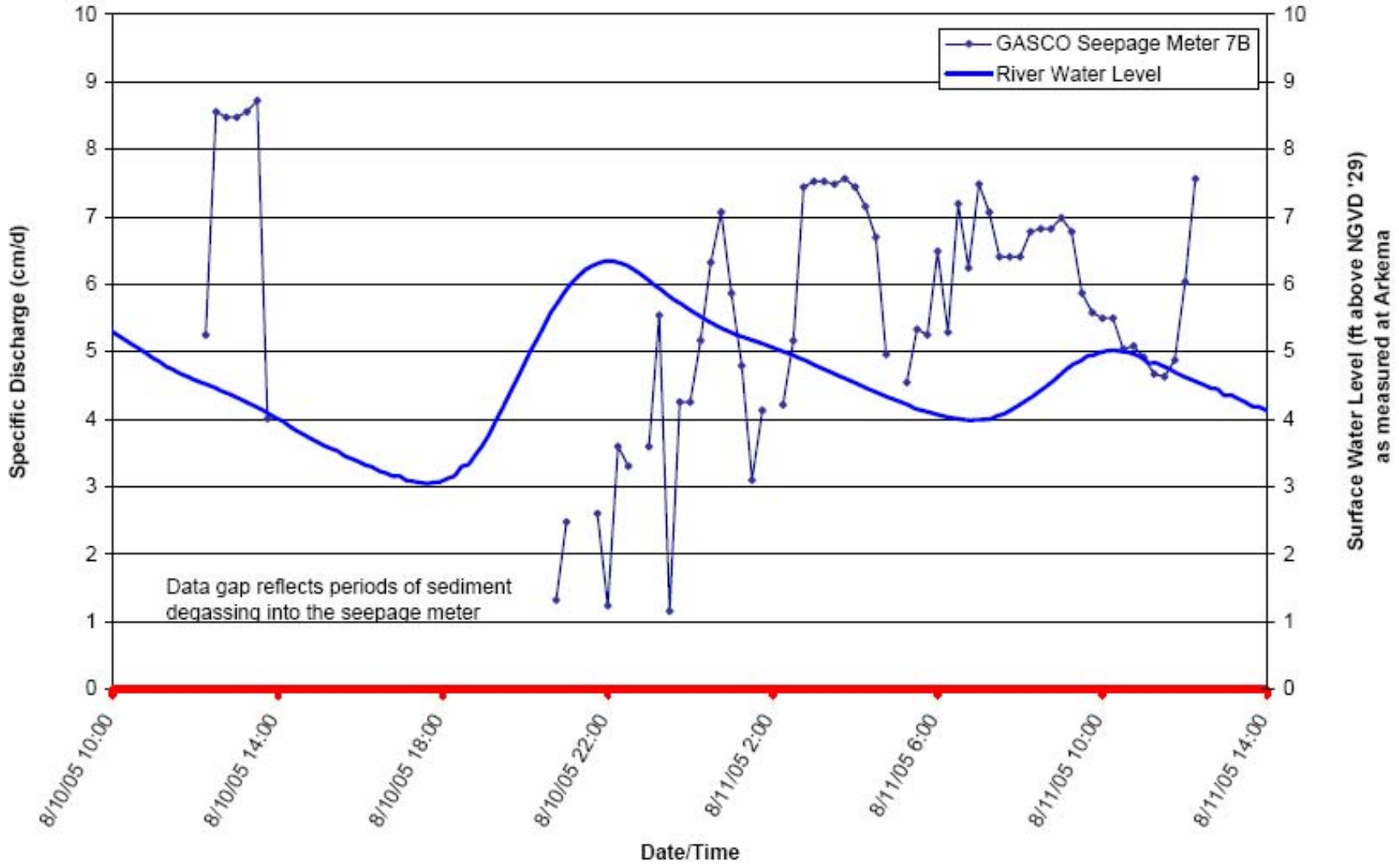


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Figure 4.6
LWG Monitoring Station GCSEEP-7B Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

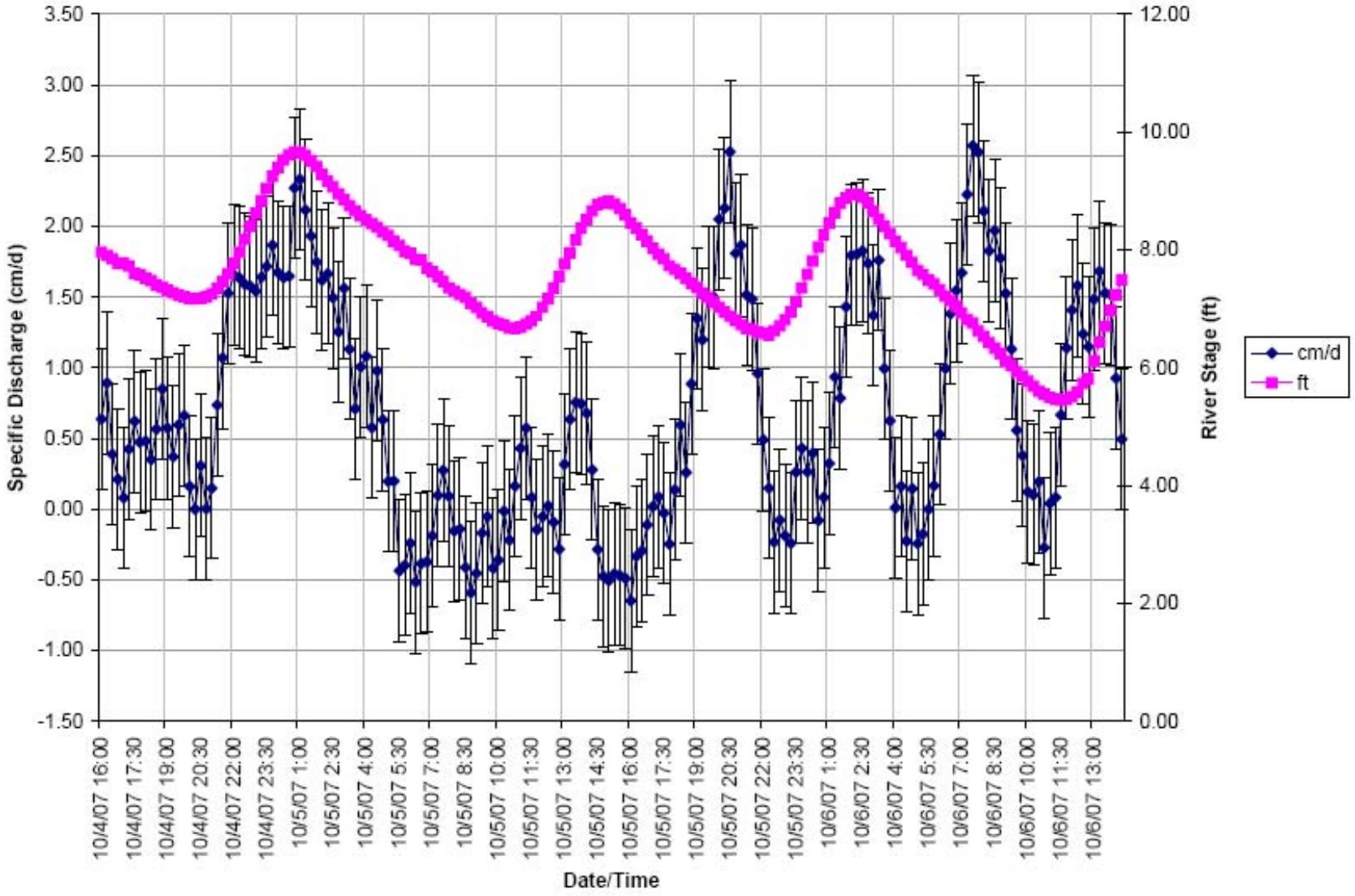

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Figure 4.7
Monitoring Station GS-C5 Groundwater Seepage Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

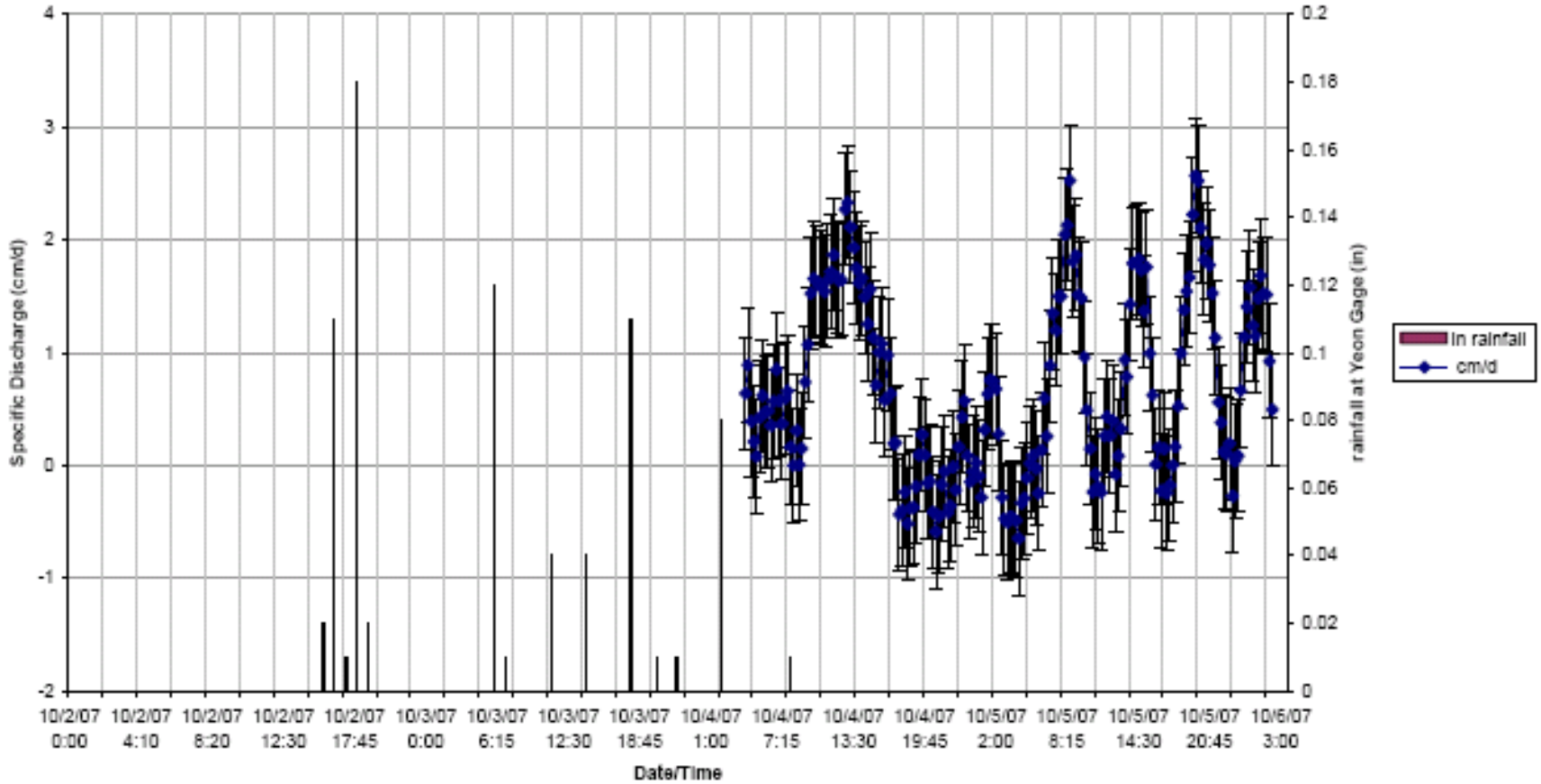

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Figure 4.8
Monitoring Station GS-C5 Groundwater Discharge Versus Precipitation
NW Natural – Gasco Site
Portland, Oregon

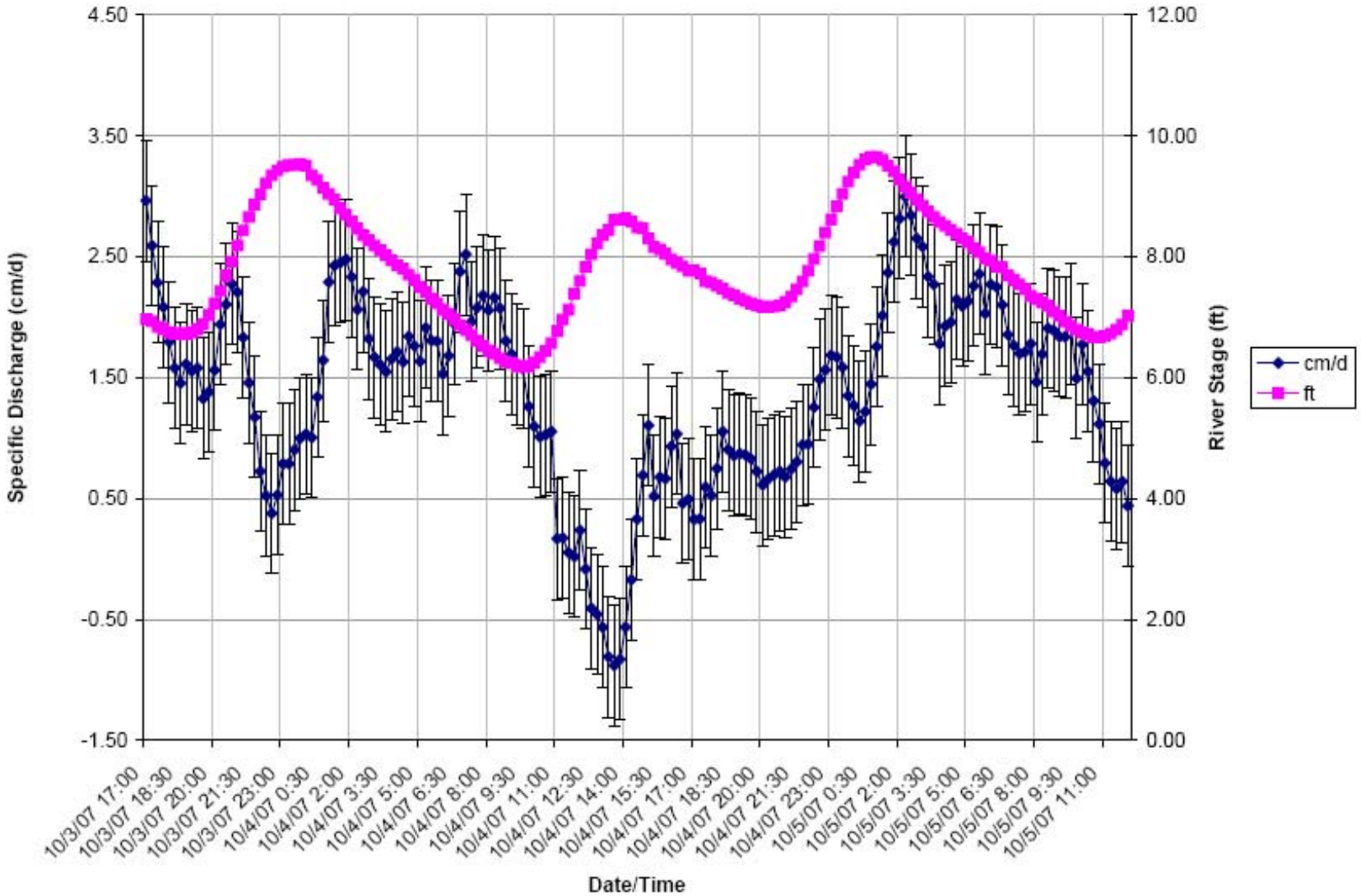

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Figure 4.9
Monitoring Station GS-C7 Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

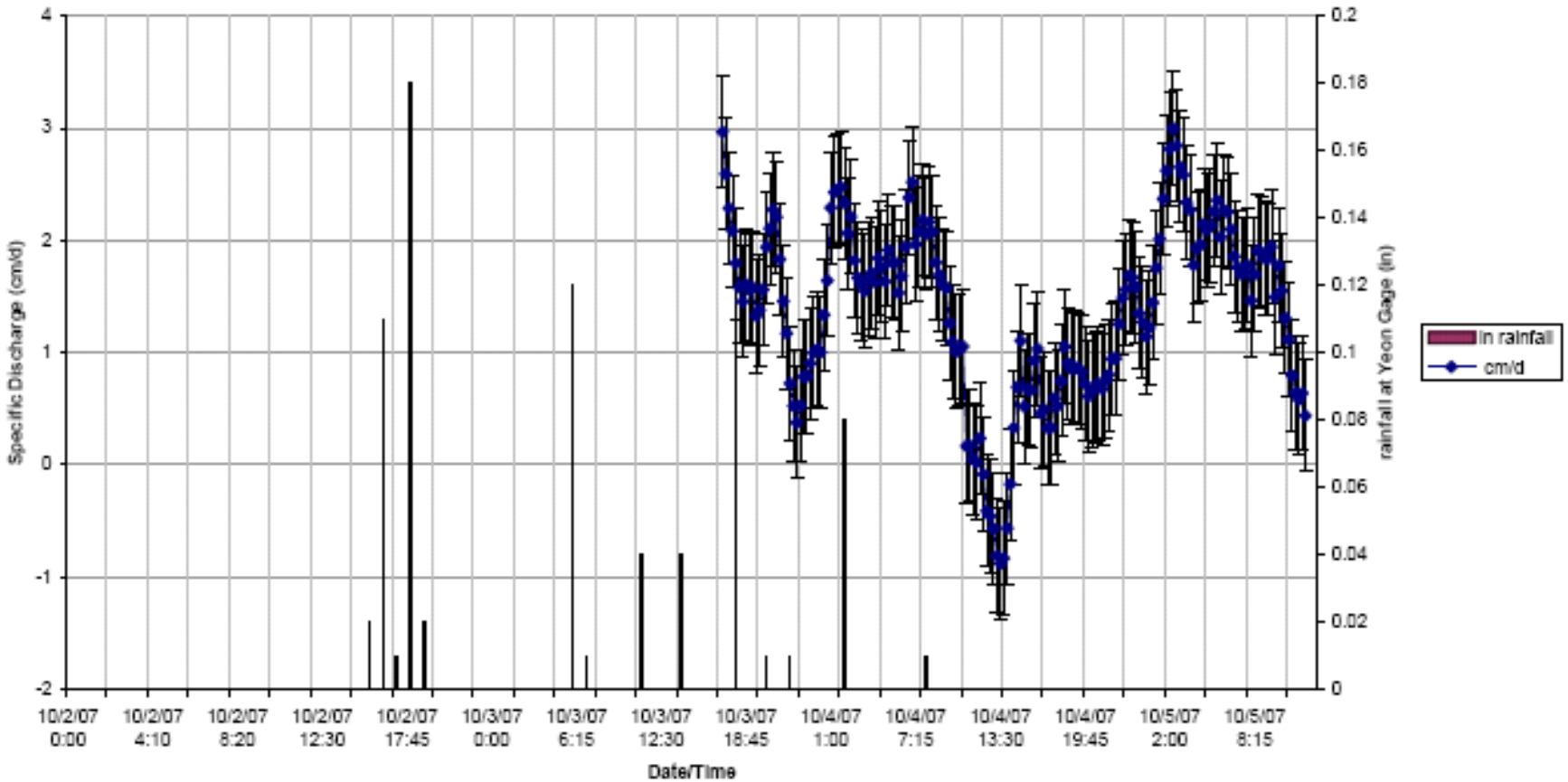

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Figure 4.10
Monitoring Station GS-C7 Groundwater Discharge Versus Precipitation
NW Natural – Gasco Site
Portland, Oregon

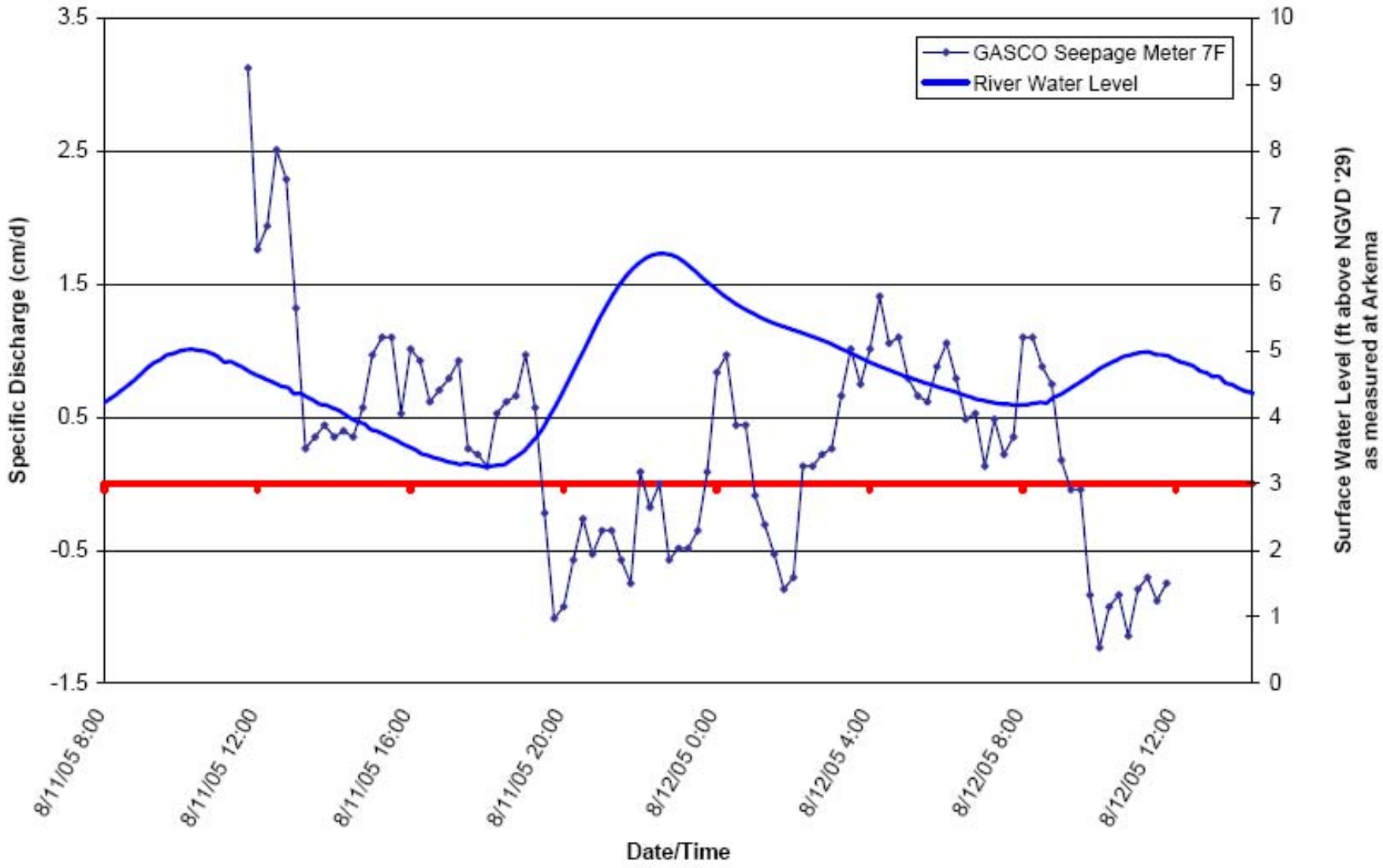

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Figure 4.11
LWG Monitoring Station GCSEEP-7F Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

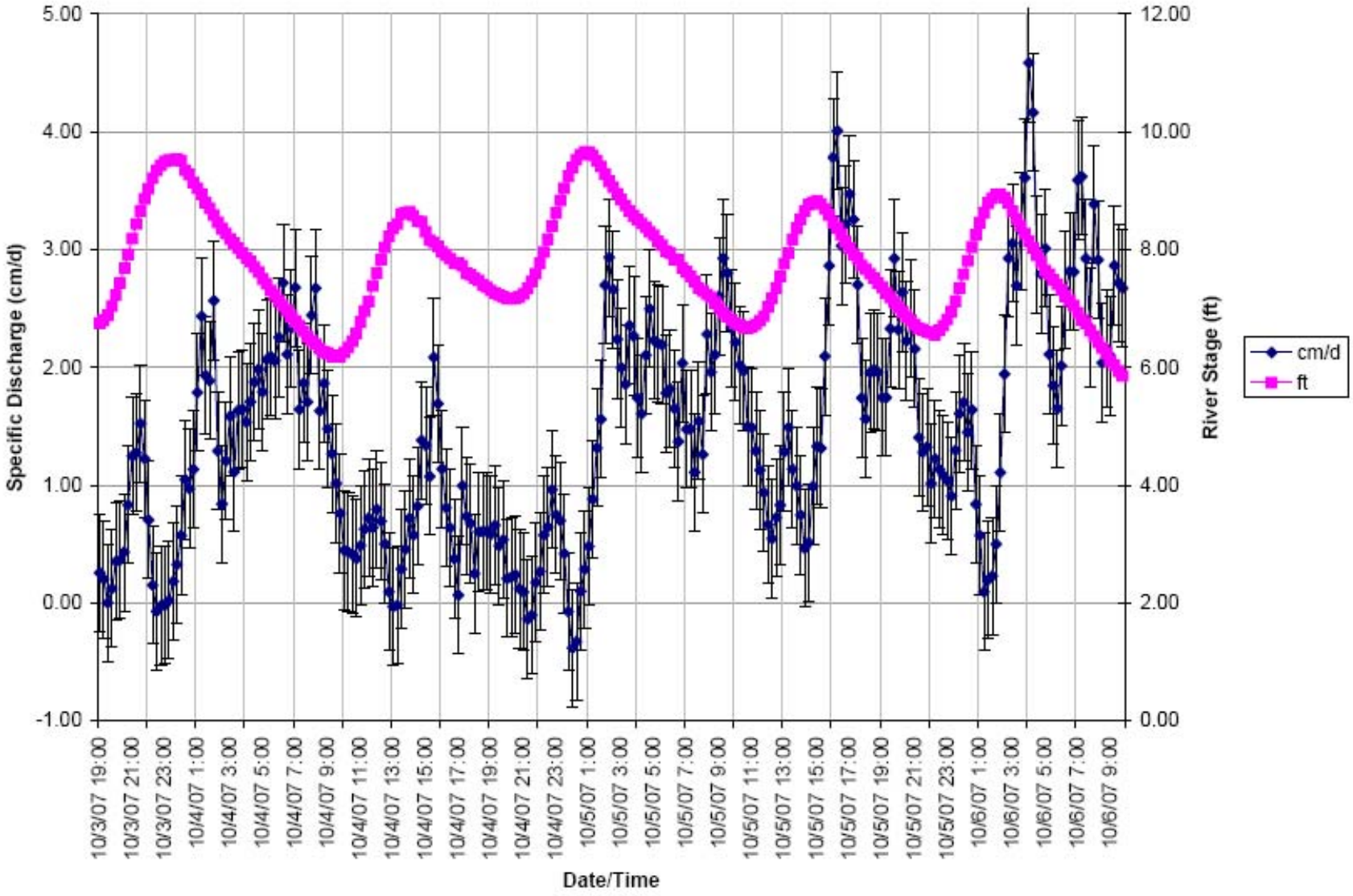

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Figure 4.12
Monitoring Station GS-D5 Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

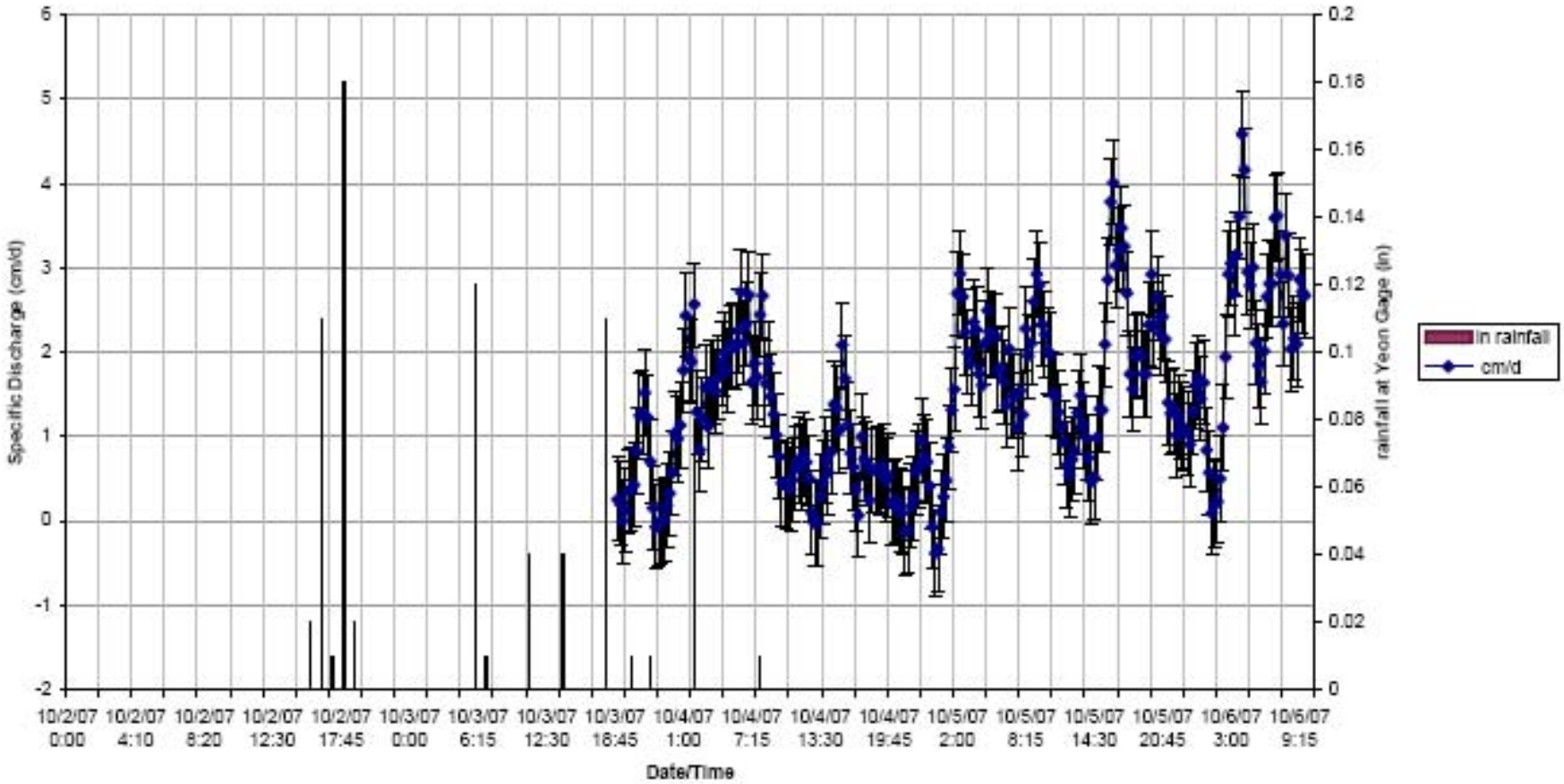

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Figure 4.13
Monitoring Station GS-D5 Groundwater Discharge Versus Precipitation
NW Natural – Gasco Site
Portland, Oregon

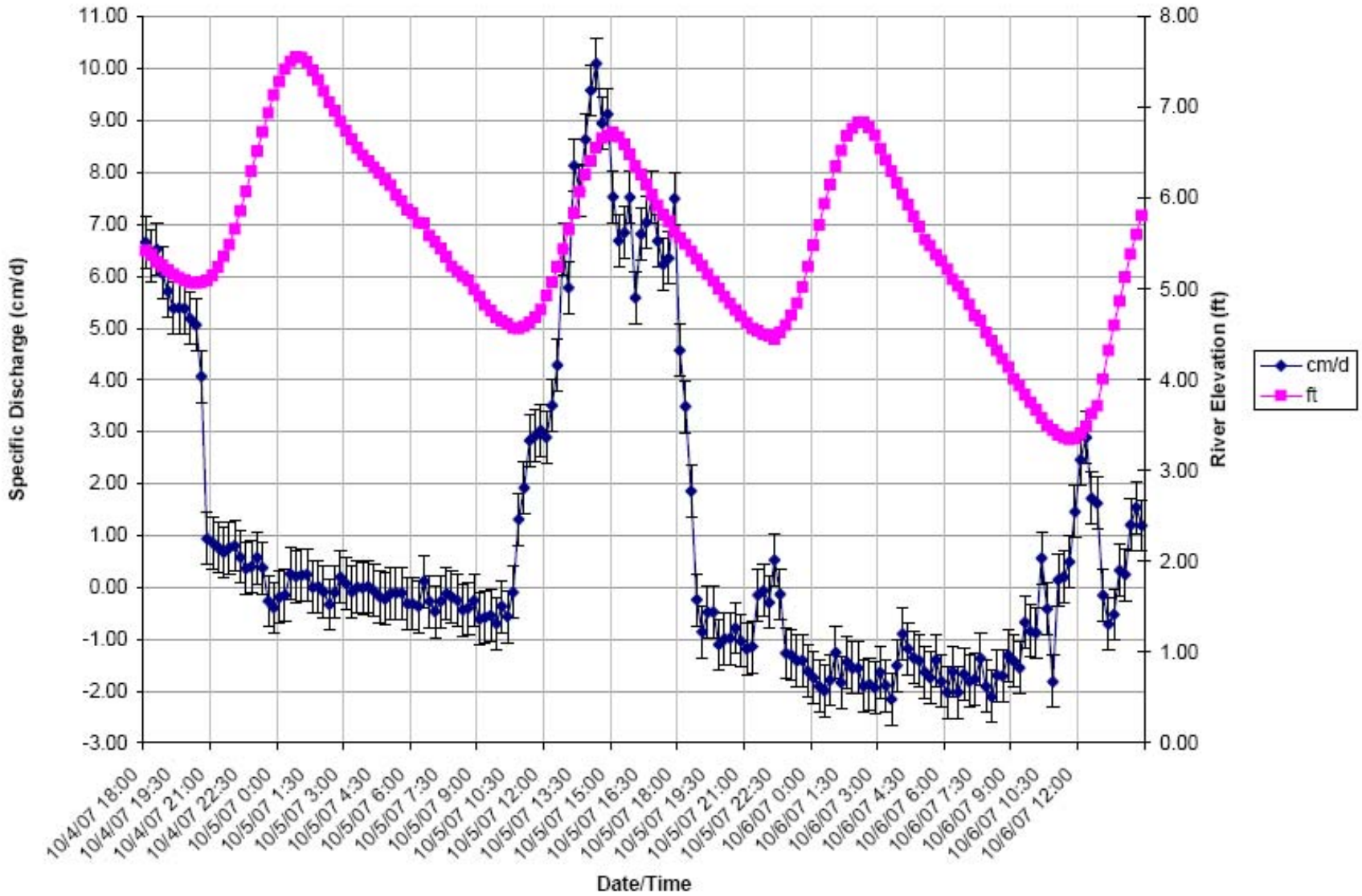

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Figure 4.14
Monitoring Station GS-PC1 Groundwater Discharge Versus River Elevation
NW Natural – Gasco Site
Portland, Oregon

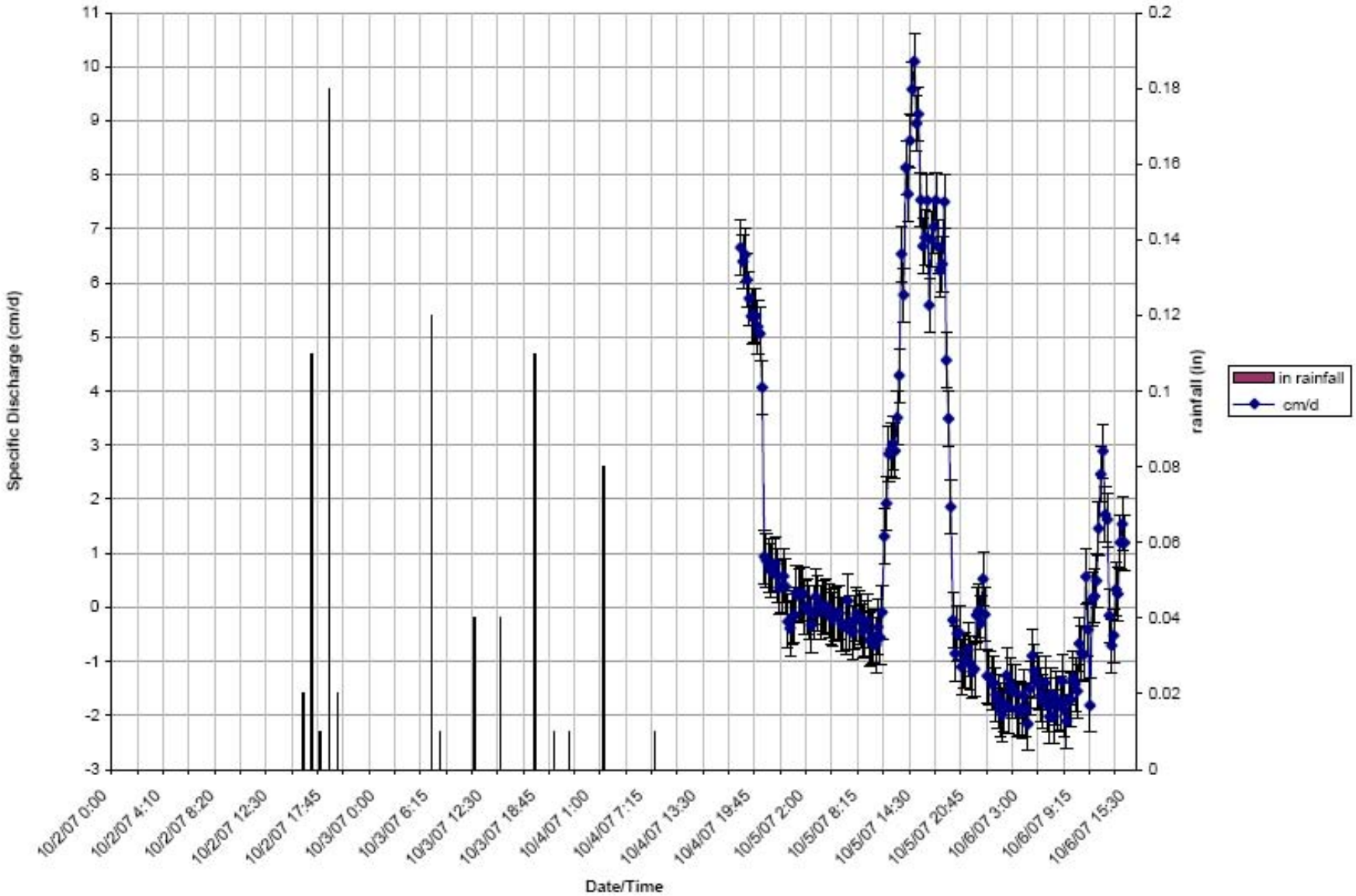

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Figure 4.15
Monitoring Station GS-PC1 Groundwater Discharge Versus Precipitation
NW Natural – Gasco Site
Portland, Oregon

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Figure 4.16
Seepage Meter Grid
NW Natural - Gasco Site
Portland, Oregon