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LETTER OF TRANSMITTAL

TO: HCDEH
100 H St., Suite 100
Eureka, CA 95501

ATTN: MARK VERHEY

DATE: April 12, 2005
JOB NO.: 4563.01
PROJECT: LOP No. 12672

TRANSMITTED BY: ☒ Mail ☐ Delivered In Person ☐ Fax

No. Copies		Description
1	1.	Subsurface Investigation Report; Report of Findings: Monitoring Well
	2.	and Boring Installation
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REMARKS:

THIS MATERIAL SENT FOR: ☒ As Requested ☒ Information ☐ Approval ☐

cc: Jim Seiler (electronically sent)

By: V.T. Sullivan
Vincent T. Sullivan, EIT

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SUBSURFACE INVESTIGATION REPORT
REPORT OF FINDINGS: MONITORING WELL AND BORING INSTALLATION

Former Fortuna Shell
819 Main Street, Fortuna, California

LOP No. 12672

Prepared for:
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April 12, 2005
Project No. 4563.01

SUBSURFACE INVESTIGATION REPORT

Report of Findings: Monitoring Well and Boring Installation
Humboldt Petroleum, Inc.; Former Fortuna Shell, 819 Main Street, Fortuna, California
LOP No. 12672; LACO ASSOCIATES Project No. 4563.01

EXECUTIVE SUMMARY

Fieldwork to monitor petroleum hydrocarbons in groundwater originating from the former underground storage tanks (USTs) at the Humboldt Petroleum, Incorporated (HPI) Fortuna Shell site, hereafter referred to as the "site," was conducted in September 2004 through November 2004 by LACO ASSOCIATES (LACO). The work activities were performed in general accordance with LACO's *Workplan: Additional Monitoring Wells* (Workplan), submitted August 2004 and approved by the Humboldt County Division of Environmental Health (HCDEH) in correspondence dated September 13, 2004. The current owner and responsible party for cleanup is Mr. Jim Seiler.

Three monitoring wells were installed during the present investigation to serve as monitoring points for the forthcoming remediation program. The presence of dissolved-phase methyl tertiary butyl ether (MTBE) in a boring installed during the present investigation led to the installation of two additional monitoring wells to delineate the dissolved-phase MTBE plume, as specified in the Workplan. Preparation of the final remediation design is underway and will be submitted under separate cover.

INTRODUCTION

During the current investigation, LACO observed the installation of monitoring wells MW14, MW15, and MW16, on September 21, 2004, borings B12 and B13 on September 30, 2004, and monitoring wells MW17S and MW17D (S = shallow, D = deep) on November 1, 2004 (Figures 1 and 2). The installations were performed by Lakes Well Drilling (Lakes) using a direct-push drilling rig. This report contains the details of the monitoring well and boring installations, sampling and drilling methodologies, a summary of soil and groundwater laboratory analytical results, discussion of findings and conclusions, and recommendations for future work at the site.

FIELD METHODS AND LABORATORY ANALYSIS

Monitoring Wells

Monitoring wells MW14, MW15, MW16, MW17S, and MW17D were installed using a direct-push drill rig fitted with 3.25-inch (outside diameter) hollow stem drive rods. Each lead drive rod was fitted with an expendable point. Continuous core soil samples (1.5-inch diameter) were

collected to a depth of approximately 10 feet bgs for monitoring wells MW14, MW15, and MW16 and to a depth of approximately 24.5 feet bgs and 32 feet bgs in monitoring wells MW17S and MW17D, respectively. Soil lithology in the monitoring wells was logged in general accordance with ASTM D-2488, noting changes in USCS classification, evidence of hydrocarbon contamination, and the presence and depth of groundwater. Monitoring well logs are included as Attachment 1. Drilling equipment was decontaminated before its use in the field and after each monitoring well installation with Alconox and a pressure washer. Soil samples for laboratory analysis were collected during the monitoring well installations.

Soil samples from the September 21, 2004, installation of monitoring wells MW14 through MW16 were submitted to North Coast Laboratories, Inc. (NCL) for analysis of:

- Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8260B
- Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) by EPA Method 8260B
- MTBE, Tertiary Butyl Alcohol (TBA), Di-isopropyl Ether (DIPE), Ethyl Tertiary Butyl Ether (ETBE), and Tertiary Amyl Methyl Ether (TAME) by EPA Method 8260B

Monitoring wells MW14 through MW16 were installed to an approximate depth of 10 feet below ground surface (bgs). The wells were constructed with 1.5-inch diameter solid PVC pipe from 0 to 5 feet bgs, and with 0.010 inch machine-slotted screen from 5 feet to the total depth. The annular spaces were filled with number 2/16 clean silica sand from 5 feet bgs to the total depth, bentonite from 1.5 to 5 feet bgs, and a neat cement slurry to grade. A locking cap was placed on the top of each of the well casings inside the access boxes. Each well was set in a water-tight "Christy" box and set in an apron of traffic-rated concrete.

Monitoring well MW17S was installed to an approximate depth of 24.5 feet bgs. The well was constructed with 1.5-inch diameter solid PVC pipe from 0 to 22.5 feet bgs, and with 0.010-inch machine-slotted screen from 22.5 feet to the total depth. The annular space was filled with number 2/16 clean silica sand from 22 feet bgs to the total depth, grout from 1.5 to 22 feet bgs, and a neat cement slurry to grade. A locking cap was placed on the top of the well casing inside the access box. Monitoring well MW17S was set in a water-tight "Christy" box and set in an apron of traffic-rated concrete.

Monitoring well MW17D was installed to an approximate depth of 28 feet bgs. The well was constructed with 1.5-inch diameter solid PVC pipe from 0 to 26 feet bgs, and with 0.010-inch machine-slotted screen from 26 feet to the total depth. The annular space was filled with number

2/16 clean silica sand from 25.5 feet bgs to the total depth, grout from 1.5 to 25.5 feet bgs, and a neat cement slurry to grade. A locking cap was placed on the top of the well casing inside the access box. Monitoring well MW17D was set in a water-tight "Christy" box and set in an apron of traffic-rated concrete.

On September 24, 2004, a LACO technician completed the monitoring well development of monitoring wells MW14 through MW16. Monitoring wells MW17S and MW17D were developed on November 4, 2004. The monitoring wells were developed with a low-flow submersible pump and closed inside diameter surge block.

The top of the well casings were surveyed to the nearest 0.01 foot, NAVD-88, under direction of a licensed surveyor, on February 7, 2005.

Borings

On September 30, 2004, LACO personnel observed the installation of two temporary borings (B12 and B13) in the alley west of the site. A site map with the boring locations is presented as Figure 2. The borings were installed to a depth of 32 feet bgs using a Geoprobe direct-push drill rig fitted with 2-inch drive outside-diameter drive rods and a Macrocore sampler. Drilling and sampling equipment were decontaminated before and after each use with Alconox. Soil lithology was classified in accordance with ASTM D-2488 criteria. A boring log for boring B12 is included as Attachment 2. Soil samples were collected from boring B12 at 12, 16, 20, and 24 feet bgs. Depth-discrete groundwater samples were collected from 20 to 22 (borings B12 and B13) and 23 to 25 feet bgs (boring B12) using a screen-point sampler.

Soil samples were collected in laboratory-supplied brass tubes, sealed with Teflon and capped. Samples were stored in ice-filled coolers until submitted to NCL for analysis under standard chain-of-custody protocol. Boring B12 was closed within 72 hours with hydrated bentonite chips to 1.5 feet bgs, and topped with local fill material to match existing grade. Boring B13 was closed within 72 hours with grout from 1.5 feet bgs to the total depth, and topped with local fill material to match existing grade.

Soil samples from the boring installation were analyzed for:

- TPHg by EPA Method 8260B
- BTEX by EPA Method 8260B
- MTBE, TBA, DIPE, ETBE, and TAME by EPA Method 8260B

Groundwater samples from the boring installations were collected and contained in laboratory supplied containers, and submitted to NCL for analysis of:

- TPHg by EPA method 8260B
- BTEX by EPA Method 8260B
- MTBE, TAME, TBA, ETBE, and DIPE by EPA Method 8260B

Groundwater Sampling

On September 24 and October 8, 2004 (monitoring wells MW14 through MW16) and November 4, 2004 (monitoring wells MW17S and MW17D), DTW measurements were collected from the monitoring wells for calculation of hydraulic head elevations. DTW measurements were also collected on November 10, 2004, from monitoring wells MW1 through MW17S/D for calculation of hydraulic head elevations. The water level was recorded when equilibration with the atmosphere was achieved, demonstrated by a change of less than 0.02 feet for measurements made not less than 5 minutes apart.

During the October 8, 2004, monitoring event, water was sampled in monitoring wells MW14 through MW16 with a 1 $^1/_2$-inch bailer. During the November 10, 2004, monitoring event, once the wells equilibrated, water was purged in monitoring wells MW1 through MW4 and MW6 through MW16 using a low-flow submersible pump at a flow rate of less than 1 liter per minute with the intake depth set within the screened interval of the water column. Details of the intake depths for the November 10, 2004, sampling event are indicated on the field sampling data sheets, included as Attachment 3. Water quality indicator parameters dissolved oxygen (DO), oxidation-reduction potential (ORP), temperature (T), potential of hydrogen (pH), and conductivity (ECw) were monitored for the November 10, 2004, sampling event in monitoring wells MW1 through MW4 and MW6 through MW16 by routing the pump discharge through a flow cell. Formation water was sampled when indicator parameters stabilized within the accuracy range of the meters for 3 consecutive readings not less than 1 minute apart. The accuracy range of the DO, ORP, ECw, pH, and T meters are +/- 0.3 mg/L, +/- 2 mV, +/- 20 μmhos, +/- 0.2 pH, and +/- 0.5 °C, respectively. Water was not purged, nor was water quality indicator parameters monitored for the November 10, 2004, sampling event in monitoring wells MW5 and MW17S/D due to the use of bailers in these wells. Water was sampled in monitoring well MW5 with a 1 $^1/_2$-inch bailer and a ¾-inch bailer was used to sample monitoring wells MW17S and MW17D.

While keeping the same flow rate, sample containers were filled directly from the pump discharge. Groundwater samples from the sampling events of October 8, 2004 (monitoring wells MW14 through MW16), and November 10, 2004 (monitoring wells MW1 through MW17S/D), were submitted to NCL for analysis of:

- TPHg by EPA Method 8260B
- BTEX by EPA Method 8260B
- MTBE, TBA, DIPE, ETBE, and TAME by EPA Method 8260B

Additionally, groundwater samples from the monitoring event of November 10, 2004, were submitted to NCL for analysis of:

- Total Petroleum Hydrocarbons as diesel/motor oil (TPHd/mo) with a silica gel cleanup by EPA Method 8015B (monitoring wells MW1 through MW16 and MW17D)
- Lead Scavengers by EPA method 8260B (monitoring wells MW1 through MW17S/D)

RESULTS OF INVESTIGATION

Site Hydrogeology

Soil encountered during the installation of the monitoring wells included silty sands, poorly graded sand with silt, silty sand with gravel, well graded sand with gravel, and silt. Groundwater was encountered from approximately 6.5 to 7 feet bgs in monitoring wells MW14 through MW16, and was encountered in monitoring well MW17D, as characterized by moist to wet soils at depths of approximately 25 to 28 feet bgs. Field notes from the monitoring well installations are included as Attachment 4.

Previous investigations at this site (LACO's *Report of Findings: Monitoring Well and Boring Installation*, submitted February 2001, and *Corrective Action Plan*, submitted February 2002) defined the hydrogeology at this site as consisting of perched, shallow, intermediate, and deep water-bearing units. The current investigation generally supported the stratigraphic characterizations presented in the February 2001 and February 2002 submittals, with a perched aquifer consisting of well graded sand with silt and gravel defined from approximately 6 to 10 feet bgs in monitoring wells MW14 through MW16.

Monitoring well MW17S, screened over a 22.5 to 24.5 feet bgs interval, was installed within the silty sand layer above the intermediate water-bearing unit. Previous investigations at this site had determined that the intermediate water-bearing unit consists of well-graded to silty sands. Monitoring well MW17D was installed within the intermediate water-bearing unit, which in the

vicinity of monitoring well MW17D, consists of poorly graded sand and silty sand with gravel, and screened over the 26 to 28 feet bgs interval. Previous investigations had determined the intermediate water-bearing unit occurred over the 25 to 35 feet bgs interval. The current investigation appears to confirm this observation, with poorly graded sands, silty sands with gravel, and silty sands observed in monitoring well MW17D to 32 feet bgs. The silty clay stratigraphic layers previously observed beneath the site and separating the intermediate and shallow water-bearing units appear to discontinue in the vicinity of monitoring wells MW17S/D.

Soil Analytical Results

Laboratory analytical results of the soil samples collected during the installation of monitoring wells MW14 through MW16 are summarized in Table A, included below, and copies of the laboratory analytical reports are included as Attachment 5. Historical soil laboratory analytical results are presented as Table 1.

Table A: Soil Analytical Results, Current Investigation

Sample Location	Sample Depth (feet bgs)	Sample Date	TPHg (µg/g)	Benzene (µg/g)	Toluene (µg/g)	Ethylbenzene (µg/g)	Xylenes (µg/g)	Fuel Oxygenates (µg/g)
4563-MW14-S4	4	9/21/2004	**2.6**	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50
4563-MW14-S10	10	9/21/2004	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50
4563-MW15-S4	4	9/21/2004	**1.7**	**0.0096**	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50
4563-MW15-S8	8	9/21/2004	**220**	**0.039**	ND<0.0050	**0.54**	**2.4**	ND<0.020-0.50
4563-MW16-S4	4	9/21/2004	**560**	**1.8**	**0.26**	**1.0**	**2.6**	ND<1.0-25
4563-MW16-S9	9	9/21/2004	**1.8**	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	**MTBE=0.057** All others ND<0.020-0.50
4563-B12-S12.0	12	9/30/2004	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50
4563-B12-S16.0	16	9/30/2004	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50
4563-B12-S20.0	20	9/30/2004	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50
4563-B12-S24.0	24	9/30/2004	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.020-0.50

In the case narrative included with NCL's laboratory analytical results, soil samples 4563-MW14-S3, 4563-MW15-S4, 4563-MW15-S8, 4563-MW16-S4, and 4563-MW16-S9 (obtained September 21, 2004) did not present a peak pattern consistent with that of gasoline. The reported results represent the amount of material in the gasoline range.

Groundwater Analytical Results

The laboratory analytical results of the groundwater samples collected from the monitoring wells and borings are summarized in Table B, included below, and copies of the analytical reports are

included as Attachment 5. Historical groundwater analytical results from previous boring installations are included as Table 2. Laboratory analytical results from the November 10, 2004, sampling event were submitted as part of LACO's *Groundwater Monitoring Report; Fourth Quarter 2004* (submitted December 2004) and are included along with monitoring well DTW measurements, hydraulic head calculations, and historic groundwater laboratory analytical results in Table 3.

Table B: Groundwater Analytical Results, Current Results

Sample Location	Sample Interval (feet bgs)	Sample Date	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Other Analytes (µg/L)
4563-B12-W20-22	20-22	9/30/2004	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
4563-B12-W23-25	23-25	9/30/2004	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<1.0-10
								MTBE = 45 All others ND<2.0-50
4563-B13-W20-22	20-22	9/30/2004	ND<100	ND<1.0	ND<1.0	ND<1.0	ND<1.0	
4563-MW14	5-10	10/8/2004	**1,400**	**0.61**	ND<0.50	**0.82**	**0.75**	**TAME = 2.2** All others ND<1.0-30
4563-MW15	5-10	10/8/2004	**2,400**	**77**	**3.6**	**32**	**17**	**TAME = 1.3** All others ND<1.0-60
4563-MW16	5-10	10/8/2004	**6,700**	**400**	**19**	**65**	**90**	**MTBE = 410** **TAME = 8.8** All others ND<1.0-80
4563-MW17S	22.5 - 24.5	11/10/2004	**64**	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**MTBE = 33** All others ND<1.0-35
4563-MW17D	26 - 28	11/10/2004	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**MTBE = 5.0** All others ND<1.0 - 170

In the case narrative included with NCL's laboratory analytical results, the groundwater sample from boring B13-W20-22 (obtained September 30, 2004) was reported as non-detect with a dilution due to insufficient sample volume, and some reporting limits were raised for this groundwater sample due to matrix interference. In the case narrative included with NCL's laboratory analytical results for the October 8, 2004, monitoring well installation, the gasoline values for the groundwater samples from monitoring wells MW14 through MW16 include the reported gasoline components and additives in addition to other peaks in the gasoline range.

ANALYTICAL RESULTS DISCUSSION

Soil Laboratory Analytical Results

Elevated concentrations of sorbed-phase TPHg appears to be localized in the areas of newly installed monitoring wells MW15 and MW16. Various combinations of BTEX constituents were reported for this area as well, albeit at concentrations ranging from two to five orders of magnitude lower than the reported TPHg concentrations. Previous investigations in this area of the site have not indicated TPHg concentrations of this magnitude. An exception to this observation is the analytical results of boring B2, located southwest and hydraulically downgradient of newly installed monitoring well MW16. TPHg laboratory analytical results for both boring B2 and monitoring well MW16 were reported as within the same order of magnitude at similar depths. Boring B5, installed hydraulically upgradient and southeast of monitoring well MW15, indicated TPHg concentrations within the same order of magnitude and two orders of magnitude lower than those TPHg concentrations reported for the newly installed monitoring well MW15. Similarly, boring B6, installed hydraulically upgradient and southeast of monitoring well MW16 indicated TPHg concentrations within the same order of magnitude, and one order of magnitude lower than those TPHg concentrations reported for the newly installed monitoring well MW16. Figure 2 illustrates the location of historical and current boring and monitoring well installations, and historical soil laboratory analytical results are presented as Table 1.

The extent of sorbed-phase hydrocarbon-impacted soil west of the site appears to have been delineated with the conclusion of the current investigation. In particular, the laboratory analytical results of monitoring well MW14 indicated TPHg concentrations within the same order of magnitude as those reported for previous borings in the area west and northwest of the site. Southwest of the site, the extent of soil impacted by sorbed-phase TPHg appears to have been delineated. Laboratory analytical results from monitoring well MW15 (220 μg/g at 8 feet bgs) indicate sorbed-phase TPHg concentrations two orders of magnitude higher than those reported for boring B6 (8.4 μg/g at 10 feet bgs), located southeast of monitoring well MW15.

As shown in Table A, all analytes for boring B12 were reported as non-detect at all sampled depths.

Groundwater Analytical Results

As discussed in LACO's *Workplan; Additional Monitoring Wells* (submitted August 2004) and in HCDEH correspondence dated August 10, 2004, MTBE detected in the groundwater sample from the 20 to 22 feet bgs interval of boring B13 resulted in the installation of monitoring well

MW17S/D. MTBE was not reported in the other boring installed during this investigation. Previously, the western extent of dissolved-phase MTBE has been limited to boring B19-00, installed approximately 120 feet east of boring B13, where MTBE was reported as 740 μg/L in December 2000.

LACO performed an MTBE plume trend analysis, using the November 10, 2004, laboratory analytical results of monitoring wells MW8, MW12, and MW17S. The purpose of this trend analysis was to approximate the extent of the MTBE plume in the hydraulically downgradient direction by calculating a bulk attenuation rate constant *k*. It is appropriate to estimate *k* between monitoring wells along the inferred centerline of a plume (USEPA, 2002). Using the MTBE concentrations of monitoring wells MW8 and MW17S, located 10 and 220 feet southwest of the site, respectively, and an inferred plume centerline defined by the lateral alignment of monitoring wells MW8 and MW17S, a site-specific *k* was calculated using a first-order decay rate equation:

$$k = \frac{-LN\left(\frac{C_g}{C_s}\right)}{x}$$

(Equation 1)

where:

k = bulk attenuation rate constant

C_g = downgradient MTBE concentration (monitoring well MW8, MTBE = 3,500 µg/L)

C_s = upgradient MTBE concentration (monitoring well MW17S, MTBE = 33 µg/L)

x = lateral distance between C_g and C_s (approximately 210 feet)

This calculated *k* (-0.0222, with units of $1/length$) was used to estimate the approximate point hydraulically downgradient of monitoring well MW17S, along an inferred centerline consisting of monitoring wells MW8, MW12, and MW17S, where the dissolved MTBE concentration would meet the North Coast Regional Water Quality Control Board (NCRWQCB) water quality objective for MTBE of 13 µg/L. Solving for *x* in Equation 1, using 3,500 µg/L for C_s, 13 µg/L for C_g, and the previously calculated *k* of -0.0222/feet, leads to a calculated hydraulically downgradient distance beyond monitoring well MW17S where MTBE concentration would meet the NCRWQCB water quality objective for MTBE. LACO estimates this distance to be

approximately 32 feet hydraulically downgradient of monitoring well MW17S, or approximately 252 feet southwest of the site, therefore delineating the hydraulically downgradient extent of dissolved-phase MTBE.

The hydraulically downgradient extent of the dissolved-phase MTBE plume appears to have been delineated. Based on the analytical results of the current investigation, the north-south extent of the dissolved-phase MTBE plume (consisting of concentrations higher than the NCRWQCB water quality objective for MTBE of 13 µg/L) appears to be relatively narrow and bounded by the area south of monitoring well MW12 and north of monitoring well MW13. The vertical extent of the dissolved-phase MTBE plume appears to have been delineated as well. Dissolved-phase concentrations of MTBE above the NCRWQCB water quality objective were reported for the shallow water-bearing unit, with dissolved-phase concentrations of MTBE below the NCRWQCB water quality objective reported for the intermediate water-bearing unit.

CONCLUSIONS AND RECOMMENDATIONS

Preparation of a remedial action plan for the *in-situ* destruction of the on-site TPHg/BTEX and fuel oxygenate secondary source was approved by the HCDEH in April 2003, and a pilot test to determine the final remedial system design was completed in August 2004. Preparation of the final remediation design is underway and will be submitted under separate cover. The final remediation design will incorporate information from the recent neighboring site investigation.

LIMITATIONS

LACO has exercised a standard of care equal to that generated for this industry to ensure that the information contained in this report is current and accurate. LACO disclaims any and all liability for any errors, omissions, or inaccuracies in the information and data presented in this report and/or any consequences arising therefrom, whether attributable to inadvertence or otherwise. LACO makes no representations or warranties of any kind including, but not limited to, any implied warranties with respect to the accuracy or interpretations of the data furnished. LACO assumes no responsibility of any third party reliance on the data presented, and that data generated for this report represents information gathered at that time and at the locations indicated. It should not be utilized by any third party to represent data for any other time or location. It is known that site and subsurface environmental conditions can change with time and under anthropologic influences. This report is valid solely for the purpose, site, and project described in this document. Any alteration, unauthorized distribution, or deviation from this description will invalidate this report.

LIST OF FIGURES, TABLES AND ATTACHMENTS

Figure 1: Location Map
Figure 2: Site Map

Table 1: Soil Analytical Results
Table 2: Historic Groundwater Analytical Results, Boring Installations
Table 3: Well Data and Groundwater Analytical Results

Attachment 1: Monitoring Well Logs
Attachment 2: Boring Log
Attachment 3: Field Sampling Data Sheets
Attachment 4: Field Notes – Monitoring Well and Boring Installations
Attachment 5: Laboratory Analytical Reports

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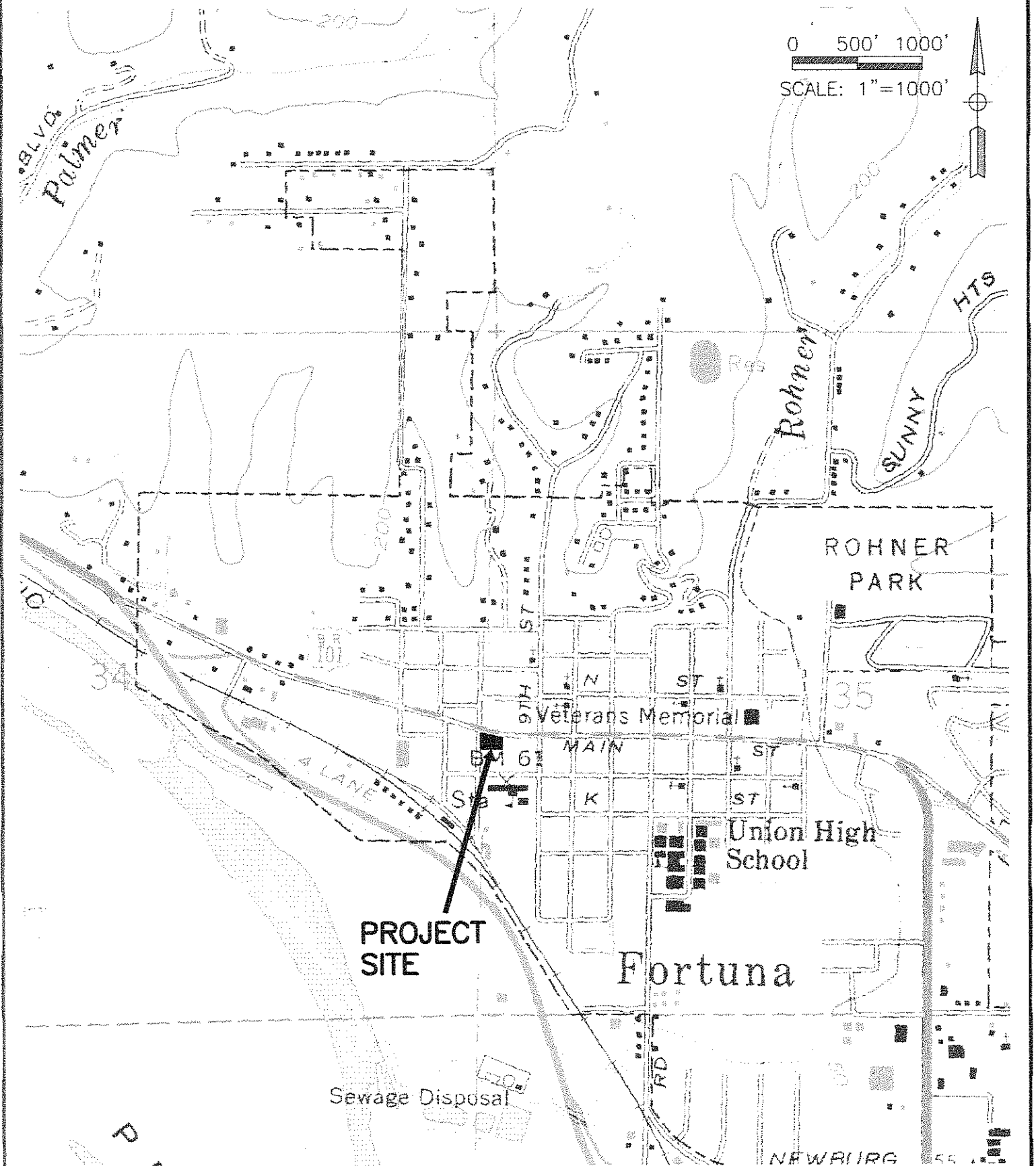
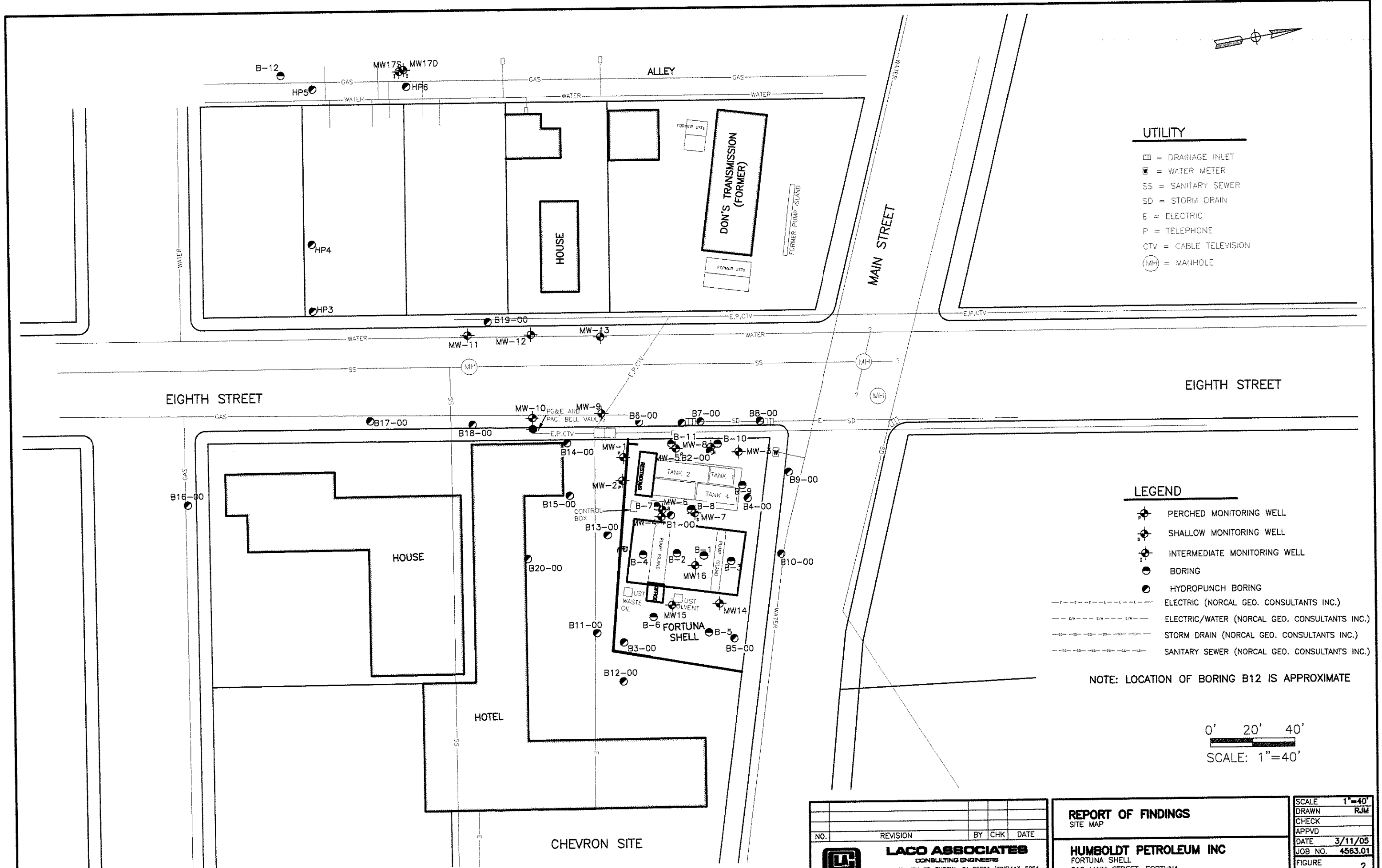
LACO ASSOCIATES CONSULTING ENGINEERS 21 W 4TH ST. EUREKA, CA 95501 (707)443-5054	PROJECT REPORT OF FINDINGS	BY RJM	FIGURE 1
	CLIENT HUMBOLDT PETROLEUM INC	DATE 2/10/05	
	LOCATION FORTUNA SHELL	CHECK	JOB NO. 4563.01
	LOCATION MAP	SCALE 1"=1000'	



Feb 10,2005-2:11pm
F:\CADFILES\4500\4563 HPI Fortuna Shell\dwg\4563-ROF-feb05\ 4563fig1.dwg



NO.	REVISION	BY	CHK	DATE

LACO ASSOCIATES
CONSULTING ENGINEERS
21 W. 4TH ST. EUREKA, CA 95501 (707)443-5054

REPORT OF FINDINGS
SITE MAP

HUMBOLDT PETROLEUM INC
FORTUNA SHELL
819 MAIN STREET, FORTUNA

SCALE	1"=40'
DRAWN	RJM
CHECK	
APPVD	
DATE	3/11/05
JOB NO.	4563.01
FIGURE	2

Mar 11,2005-9:55am
T:\CADFILES\4500\4563 HPI Fortuna Shell\dwg\4563-ROF-feb05\ 4563-baseMap_mar11-05.dwg

TABLE 1: SOIL ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, CA
LACO No. 4563.01; LOP No. 12672

Sample Location	Sample Depth (feet)	Sample Date	TPHg (µg/g)	TPHd (µg/g)	TPHmo (µg/g)	Benzene (µg/g)	Toluene (µg/g)	Ethylben-zene (µg/g)	Xylenes (µg/g)	Fuel Oxygenates (µg/g)	Lead Scavengers (µg/g)
Pre-UST Closure Investigation											---
4563-B1	5	8/10/1998	3.5	50	---	0.25	ND<0.4	ND<0.2	ND<0.2	MTBE=0.94	---
	10	8/10/1998	8.4	ND<1.0	---	0.011	ND<0.04	ND<0.06	ND<0.06	MTBE=0.069	---
4563-B2	5	8/10/1998	520	38	---	ND<1.5	ND<4.0	ND<8.0	ND<8.0	MTBE=0.74	---
	10	8/10/1998	6.9	ND<1.0	---	ND<0.03	ND<0.04	ND<0.06	ND<0.06	MTBE=0.065	---
4563-B3	5	8/10/1998	400	59	---	ND<1.0	0.3	ND<3.0	ND<7.0	MTBE=0.83	---
	10	8/10/1998	ND<1.0	ND<1.0	---	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.050	---
4563-B4	5	8/10/1998	44	1.3	---	ND<0.07	ND<0.2	ND<0.32	ND<0.32	MTBE=0.088	---
	10	8/10/1998	ND<1.0	ND<1.0	---	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE=0.054	---
4563-B5	5	8/10/1998	ND<1.0	ND<1.0	---	ND<0.005	ND<0.005	ND<0.16	ND<0.16	ND<0.050	---
	10	8/10/1998	ND<1.0	ND<1.0	---	ND<0.005	ND<0.005	ND<0.050	ND<0.050	ND<0.050	---
4563-B6	5	8/10/1998	16	3.2	---	ND<0.04	ND<0.04	ND<0.20	ND<0.20	MTBE=0.085	---
	10	8/10/1998	8.4	6.2	---	ND<0.02	ND<0.10	ND<0.10	ND<0.10	MTBE=0.092	---
4563-B7	5	8/11/1998	230	12	---	0.62	ND<2.0	ND<2.0	ND<2.0	MTBE=1.1	---
	10	8/11/1998	3.4	ND<1.0	---	0.016	ND<0.02	ND<0.04	ND<0.04	MTBE=0.11	---
AUGER	10	8/11/1998	1,400	28	---	3.0	ND<12	17	94	ND<10	---
4563-B9	5	8/11/1998	1.4	ND<1.0	---	0.025	ND<0.005	ND<0.005	ND<0.005	MTBE=0.085	---
	10	8/11/1998	10	ND<1.0	---	ND<0.04	ND<0.08	ND<0.08	ND<0.08	MTBE=0.14	---
4563-B10	5	8/11/1998	520	51	---	1.1	ND<5.0	ND<5.0	ND<2.0	MTBE=2.9	---
	10	8/11/1998	7.8	ND<1.0	---	ND<0.04	ND<0.08	0.07	0.09	MTBE=0.39	---
4563-B11	5	8/11/1998	1,000	27	---	2.7	ND<20	ND<10	ND<10	MTBE=7.3	---
	10	8/11/1998	33	1.2	---	0.082	ND<0.5	0.24	0.34	MTBE=0.78	---
UST Closure											
4563#1	9'	11/11/1998	160	1.4	18	ND<0.050	ND<0.050	0.4	0.39	ND<0.50	---
4563#2	9'	11/11/1998	340	3.9	20	ND<0.050	ND<0.40	1.8	1.3	MTBE= 0.8	---
4563#3	9'	11/11/1998	16	55	320	ND<0.0050	ND<0.020	0.039	0.039	MTBE= 0.065	---
4563#4	9'	11/11/1998	630	---	---	150	ND<0.025	690	450	MTBE= 51	---
4563#5	3'	11/11/1998	2.5	ND<1.0	ND<10	0.092	0.0079	0.014	0.038	MTBE= 0.021	---
4563#6	3'	11/11/1998	34	ND<1.0	10	0.7	0.23	0.59	0.67	MTBE= 3.5	---
4563#7	3'	11/11/1998	62	3.5	ND<10	0.2	ND<0.20	ND<0.40	ND<0.40	MTBE= 0.82	---
4563#8	3'	11/11/1998	9.8	2.9	35	0.14	0.094	0.064	0.12	ND<0.50	---
										MTBE= 0.01	
4563#9	3'	11/11/1998	1.7	ND<1.0	ND<10	0.061	ND<0.0050	0.0065	0.018	TBA=0.01	---
4563#10	3'	11/11/1998	ND<1.0	ND<1.0	ND<10	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.50	---
2000 Investigation											
MW 1	5.0'	7/25/2000	3.6	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.02
	9.0'	7/25/2000	ND<1000.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE = 0.0058	ND<0.02
	10.0'	7/25/2000	ND<1000.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE = 0.0066	ND<0.02
MW 2	5.0'	7/25/2000	96	10	ND<10.0	ND<0.016	ND<0.016	ND<0.016	ND<0.016	ND<0.016	ND<0.04
	7.0'	7/25/2000	830	32	10	ND<0.16	ND<0.16	0.18	0.16	ND<0.16	ND<0.04
	10.0'	7/25/2000	ND<1000	ND<1.0	ND<10	0.0071	ND<0.005	ND<0.005	ND<0.005	MTBE = 0.0046	ND<0.02
MW 3	5.0'	7/25/2000	110	13	47	ND<0.04	ND<0.04	ND<0.04	ND<0.04	MTBE = 0.081	ND<0.1
	10.0'	7/25/2000	ND<1000.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE = 0.055	ND<0.02
	12.0'	7/25/2000	ND<1.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE =0.13	ND<0.02
	15.0'	7/25/2000	ND<1.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE = 0.83	ND<0.02
MW 4	2.0'	7/26/2000	4.8	ND<1.0	ND<10.0	0.042	ND<0.005	0.012	0.0404	MTBE =0.018	ND<0.02
	5.0'	7/26/2000	4.9	ND<1.0	ND<10.0	0.059	ND<0.005	ND<0.005	0.013	MTBE = 0.028	ND<0.02
	7.0'	7/26/2000	20	1.4	ND<10.0	0.022	ND<0.008	0.037	0.018	MTBE = 0.013	ND<0.02
	10.0'	7/26/2000	ND<1.0	ND<1.0	ND<10.0	0.016	ND<0.005	ND<0.005	ND<0.005	MTBE =0.013	ND<0.02
MW 5	5.0'	7/26/2000	1500	23	14	1.4	0.17	4.5	7.34	MTBE =0.35	ND<0.4
	8.0'	7/26/2000	670	10	22	0.67	ND<0.8	5.5	2.69	MTBE =0.32	ND<0.002
	10.0'	7/26/2000	17	9.7	21	0.0089	ND<0.005	0.0085	0.0058	MTBE =0.09	ND<0.002
	15.0'	7/26/2000	ND<1.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE =0.75	ND<0.002
MW 6	15.0'	7/26/2000	1.5	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE =0.019	ND<0.002
MW 7	5.0'	7/27/2000	730	230	3100	2.4	0.56	1.8	19.58	MTBE =0.12	ND<0.02
	10.0'	7/27/2000	ND<1.0	ND<1.0	ND<10.0	0.016	ND<0.005	ND<0.005	0.0053	MTBE =0.066	ND<0.002
	14.0'	7/27/2000	ND<1.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE =0.013	ND<0.002
MW 8	2.0'	7/27/2000	8.2	ND<1.0	ND<10.0	0.093	ND<0.005	0.009	0.026	MTBE =0.2	ND<0.002
	5.0'	7/27/2000	1400	17	44	2.5	0.2	1.7	1.6	MTBE = 1.1	ND<0.4
	10.0'	7/27/2000	ND<1.0	ND<1.0	ND<10.0	0.0052	ND<0.005	ND<0.005	ND<0.005	MTBE =0.5	ND<0.002
	20.0'	7/27/2000	ND<1.0	ND<1.0	ND<10.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE =0.83	ND<0.002
B1-00	8.0'	5/17/2000	1,400	100	610	ND<2.0	ND<8.0	10	25.0	MTBE ND<5.0	---
	10.0'	5/17/2000	ND<1.0	ND<1.0	ND<10	0.014	ND<0.005	ND<0.005	0.0066	MTBE ND<0.05	---
	17.0'	5/17/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	0.0055	ND<0.005	0.0081	MTBE = 0.16	---
	24.0'	5/17/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	0.0062	MTBE ND<0.05	---
	27.0'	5/17/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	29.0'	5/17/2000	1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	34.0'	5/17/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	39	5/17/2000	1.7	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---

TABLE 1: SOIL ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, CA
LACO No. 4563.01; LOP No. 12672

Sample Location	Sample Depth (feet)	Sample Date	TPHg (µg/g)	TPHd (µg/g)	TPHmo (µg/g)	Benzene (µg/g)	Toluene (µg/g)	Ethylben-zene (µg/g)	Xylenes (µg/g)	Fuel Oxygenates (µg/g)	Lead Scavengers (µg/g)
2000 Investigation, continued											
B2-00	3.0'	5/18/2000	**15**	**1.4**	ND<10	**0.087**	ND<0.08	ND<0.04	ND<0.04	**MTBE = 0.22**	---
	9.0'	5/18/2000	**18**	ND<1.0	ND<10	ND<0.005	ND<0.01	ND<0.1	ND<0.1	**MTBE = 0.065**	---
	14.0'	5/18/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND <0.05	---
	19.0'	5/18/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	**MTBE = .059**	---
	24.0'	5/18/2000	ND<1.0	ND<1.0	ND<10	**0.067**	ND<0.005	ND<0.005	ND<0.01	MTBE ND<0.05	---
B3-00	9.0'	5/22/2000	**9.4**	**170**	**1,100**	ND<0.005	ND<0.01	ND<0.08	ND<0.08	MTBE ND<0.05	---
	14.0'	5/22/2000	**3.2**	**18**	**120**	ND<0.005	ND<0.005	ND<0.02	ND<0.002	MTBE ND<0.05	---
	19.0'	5/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B4-00	3.0'	5/24/2000	**12**	ND<1.0	ND<10	**0.099**	ND<0.1	ND<0.06	ND<0.06	MTBE ND<0.05	---
	6.0'	5/24/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	9.0'	5/24/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	14.0'	5/24/2000	**4.9**	ND<1.0	ND<10	**0.0057**	ND<0.03	ND<0.03	ND<0.03	**MTBE = 0.099**	---
	19.0'	5/24/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B6-00	2.0'	11/22/2000	**1.6**	**1.1**	ND<10	ND<0.005	ND<0.005	**0.005**	**0.014**	MTBE ND<0.05	---
	7.0'	11/22/2000	**670**	**48**	**49**	**0.59**	ND<8.0	ND<10	ND<10	MTBE ND<0.05	---
	9.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B7-00	2.0'	11/22/2000	**8.3**	**1.8**	ND<10	**0.0075**	ND<0.04	ND<0.04	**0.05**	MTBE ND<0.05	---
	6.0'	11/22/2000	**4.2**	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.02	ND<0.02	MTBE ND<0.05	---
	9.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	**MTBE= 0.37**	---
B8-00	2.0'	11/22/2000	ND<1.0	**1.3**	**19**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	5.0'	11/22/2000	ND<1.0	**1.1**	**18**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	10.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	15.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B9-00	2.0'	11/22/2000	**2.3**	ND<1.0	ND<10	ND<0.005	ND<0.015	ND<0.005	ND<0.03	MTBE ND<0.05	---
	7.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	10.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	15.0'	11/22/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B10-00	2.0'	11/22/2000	**2.3**	ND<1.0	ND<10	ND<0.005	ND<0.01	ND<0.005	ND<0.03	MTBE ND<0.05	---
	5.0'	11/22/2000	ND<1.0	ND<1.0	**10**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B11-00	4.5'	11/27/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	8.0'	11/27/2000	**6.2**	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.07	ND<0.07	MTBE ND<0.05	---
	10.0'	11/27/2000	ND<1.0	**3.6**	**71**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B12-00	4.5'	11/27/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	15.0'	11/27/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B13-00	4.0'	11/28/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	7.0'	11/28/2000	**7.2**	**51**	**430**	ND<0.005	ND<0.060	ND<0.15	ND<0.15	MTBE ND<0.05	---
B14-00	4.0'	11/28/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.5	---
	13.0'	11/28/2000	**4.7**	**1.3**	**42**	ND<0.005	ND<0.005	ND<0.04	ND<0.04	MTBE ND<0.05	---
B15-00	4.5'	11/29/2000	**1.8**	ND<1.0	**30**	ND<0.005	ND<0.005	ND<0.02	ND<0.02	MTBE ND<0.05	---
	7.0'	11/29/2000	**2.1**	**2.5**	**120**	ND<0.005	ND<0.01	ND<0.02	ND<0.02	MTBE ND<0.05	---
B16-00	5.0'	12/18/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	8.0'	12/18/2000	ND<1.0	ND<1.0	**20**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B17-00	5.0'	12/18/2000	**1.1**	**3.2**	**17**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	15.0'	12/18/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B18-00	5.0'	12/19/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	8.0'	12/19/2000	**1.9**	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	12.0'	12/19/2000	**1.3**	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	15.0'	12/19/2000	**1.5**	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B19-00	5.0'	12/19/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	10.0'	12/19/2000	ND<1.0	ND<1.0	ND<10	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
B20-00	5.0'	12/20/2000	ND<1.0	ND<1.0	**12**	ND<0.005	ND<0.005	ND<0.005	ND<0.005	MTBE ND<0.05	---
	7.0'	12/20/2000	**3**	**2.1**	**75**	ND<0.005	ND<0.005	ND<0.01	ND<0.005	MTBE ND<0.05	---
	9.0'	12/20/2000	**160**	**3.2**	**42**	ND<0.005	ND<0.3	ND<1.0	ND<1.0	MTBE ND<0.05	---

TABLE 2: HISTORIC GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, CA
LACO No. 4563.01; LOP No. 12672

Sample Number	Sample Date	TPHg (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	Fuel Oxygenates (µg/L)	Lead Scavengers (µg/l)
Pre-UST Closure Investigation										
4563-B1	8/10/1998	46,000	190,000	---	3,300	160	890	760	MTBE=2,700 ETBE=57 TAME=27	ND
4563-B2	8/10/1998	100,000	34,000	---	2,300	ND<1000	1,200	2,320	MTBE=1,200	ND
4563-B3	8/10/1998	47,000	130,000	---	2,200	920	1,200	2,950	MTBE=1,200	---
4563-B4	8/10/1998	11,000	670	---	680	ND<100	ND<13	47	MTBE=270	---
4563-B5	8/10/1998	11,000	93,000	---	ND<100	ND<50	25	ND<13	MTBE=170	---
4563-B6	8/10/1998	12,000	1,500,000	---	170	ND<100	62	82	MTBE=400	---
4563-B7	8/11/1998	38,000	31,000	---	2,800	ND<200	240	290	MTBE=1,200	---
4563-B8	8/11/1998	82,000	79,000	---	4,000	660	2,900	16,000	MTBE=1,000	ND
4563-B9	8/11/1998	22,000	2,300	---	1,600	ND<200	480	590	MTBE=1,900	---
4563-B10	8/11/1998	37,000	88,000	---	4,800	870	670	1,300	MTBE=19,000	---
4563-B11	8/11/1998	38,000	3,700	---	3,700	ND<1000	820	640	MTBE=7,900	ND
UST Closure										
UST CAVITY	11/11/1998	210,000	4,000,000	ND<2,500,000	310	520	3800	29000	3300	---
B1-00 1A	5/17/2000	18,000	2,800	460	1,400	130	390	632	MTBE = 370 TAME = 36	ALL ND
B1-00 2A	5/17/2000	960	180	ND<170	27	7.5	23	45.3	MTBE = 860 TBA = 71 DIPE = 2.7 TAME = 13 ETBE = 5.4	ALL ND
B2-00 1A	5/17/2000	32,000	5,600	6,600	1,400	320	1,200	2,430	MTBE = 5500 TAME = 260	ALL ND
B2-00 2A	5/18/2000	4,500	3,100	4,100	200	16	110	173	MTBE = 2100 TBA = 910 ETBE = 6.4 TAME = 210	ALL ND
B3-00 1A	5/22/2000	1,600	16,000	97,000	14	1.2	1.3	3.5	MTBE = 41	ALL ND
B3-00 2A	5/22/2000	80	94	200	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 5.7	ALL ND
B4-00 2A	5/24/2000	340.0	120.0	ND<170	1.9	ND<0.5	0.6	ND<0.5	MTBE = 140 TAME = 5.7	ALL ND
B5-00 2A	5/25/2000	150.0	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 0.58	ALL ND
B6-00 1A	11/22/2000	6,500	470	ND<170	110	11	84	39	MTBE = 31	ALL ND
B6-00 2A	11/22/2000	740	93	220	2.9	ND<1.0	1.9	ND<1.0	MTBE = 910 ETBE = 7.7 TAME = 9.1	1,2-Dichloro-ethane = 8.5
B7-00 1A	11/22/2000	1,900	53	ND<170	ND<2.5	ND<2.5	ND<2.5	ND<2.5	MTBE = 2200 TBA = 690 TAME = 240	ALL ND
B7-00 2A	11/22/2000	500	82	240	ND<2.5	ND<2.5	ND<2.5	ND<2.5	MTBE = 350 TBA = 140	1,2-Dichloro-ethane = 7.0
B8-00 1A	11/22/2000	110	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 130 TAME = 5.6	ALL ND
B8-00 2A	11/22/2000	230	---	---	ND<1.0	ND<1.0	ND<1.0	ND<1.0	MTBE = 45	ALL ND
B9-00 1A	11/22/2000	ND<50	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	ALL ND
B9-00 2A	11/22/2000	ND<50	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 8.0	ALL ND
B10-00 2A	11/22/2000	ND<50	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 1.2	ALL ND
B11-00 1A	11/22/2000	180	52	910	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 9.6	ALL ND
B11-00 2A	11/27/2000	ND<50	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 4.4	ALL ND
B12-00 1A	11/28/2000	750	110	330	ND<0.5	ND<0.5	1.1	ND<0.5	MTBE = 0.78	ALL ND
B12-00 2A	11/28/2000	ND<50	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 4.3	ALL ND
B13-00 1A	11/27/2000	1,900	190	1,400	11	0.6	1.5	2	MTBE = 7.4	ALL ND
B13-00 2A	11/28/2000	430	290	1,300	5.7	ND<0.5	ND<0.5	ND<0.5	MTBE = 50	ALL ND
B14-00 1A	11/28/2000	1,400	97	ND<170	4.9	ND<0.5	0.7	2.2	MTBE = 350 TAME = 75	ALL ND
B14-00 2A	11/29/2000	950	90	ND<10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	MTBE = 1500 TBA = 320 DIPE = 3.8 TAME = 7.2 ETBE = 10	ALL ND

TABLE 2: HISTORIC GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, CA
LACO No. 4563.01; LOP No. 12672

Sample Number	Sample Date	TPHg (µg/l)	TPHd (µg/l)	TPHmo (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylenes (µg/l)	Fuel Oxygenates (µg/L)	Lead Scavengers (µg/l)
UST Closure, continued										
B15-00 1A	11/29/2000	860	76	ND<170	3.8	ND<0.5	ND<0.5	0.5	MTBE = 91 TBA = 38 TAME = 7.9	ALL ND
B15-00 2A	11/29/2000	410	59	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 860 TBA = 250 DIPE = 3.1 ETBE = 7.4 TAME = 2.8	ALL ND
B16-00 1A	12/18/2000	ND<50	130	600	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
B16-00 2A	12/18/2000	ND<500	1,200	5,800	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ALL ND	
B17-00 1A	12/18/2000	ND<50	ND<50	ND<170	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
B17-00 2A	12/19/2000	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
B18-00 1A	12/19/2000	150	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 79 TBA = 16 TAME = 6.0	---
B18-00 2A	12/20/2000	270	---	---	ND<0.5	1	ND<0.5	ND<0.5	MTBE = 18	---
B19-00 1A	12/19/2000	ND<50	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
B19-00 2A	12/20/2000	1,400	---	---	ND<1.0	ND<1.0	ND<1.0	ND<1.0	MTBE = 740 TBA = 140 ETBE = 4.3 TAME = 2.7	---
B20-00 1A	12/20/2000	760	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 7.1	---
B20-00 2A	12/20/2000	480	---	---	ND<0.5	ND<0.5	ND<0.5	ND<0.5	MTBE = 290 TBA = 42 ETBE = 2.0	---
2001 Investigation										
HP-1	10/16/2001	210.0	---	---	5.1	ND<0.5	ND<0.5	ND<0.5	MTBE = 1.1 TBA = 75 DIPE=58	---
HP-2	10/16/2001	280.0	---	---	0.77	ND<0.5	ND<0.5	ND<0.5	MTBE = 0.99 TBA = 110 DIPE=64	---
HP-3	10/16/2001	ND<50	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
HP-4	10/16/2001	ND<50	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
HP-5	10/16/2001	ND<50	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ALL ND	---
HP-6	10/16/2001	Insufficient water to sample								

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
PERCHED																
MW-1	59.67															
8/4/2000		53.51	6.16	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**53.41**	**6.26**	**3,600**	**230**	ND<170	**42**	**5**	**27**	**20.1**	**500**	ND<20	**56**	ND<1.0	ND<1.0	
9/8/2000		52.64	7.03	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		52.15	7.52	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**53.91**	**5.76**	**2,900**	**210**	ND<170	**9.2**	**1.4**	**8.1**	**5.5**	**250**	**120**	**27**	ND<1.0	ND<1.0	
12/12/2000		54.60	5.07	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		54.83	4.84	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**54.83**	**4.84**	**2,800**	**570**	ND<170	**23**	**2.4**	**12**	**4.8**	**74**	ND<20	ND<2.0	ND<2.0	ND<2.0	
3/12/2001		55.47	4.20	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		54.87	4.80	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**54.69**	**4.98**	**3,400**	**420**	ND<200	**37**	**3.9**	**19**	**7.52**	**120**	ND<10	ND<1.0	ND<1.0	ND<1.0	
6/8/2001		54.42	5.25	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		53.69	5.98	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2001		**53.21**	**6.46**	**2,300**	**190**	ND<170	**25**	**3.6**	**18**	**9.42**	**130**	ND<5.0	ND<1.0	ND<1.0	ND<1.0	
9/17/2001		52.69	6.98	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		52.15	7.52	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**52.13**	**7.54**	**4,300**	**350**	ND<170	**25**	**2.2**	**15**	**7.5**	**94**	**53**	**9.2**	ND<1.0	ND<1.0	
2/5/2002		**55.60**	**4.07**	**2,100**	**99**	---	**16**	**3.9**	**24**	**8.5**	**20**	**25**	**2.6**	ND<1.0	ND<1.0	
5/9/2002		**54.85**	**4.82**	**2,300**	**130**	ND<170	**18**	**2.6**	**16**	**3.6**	**8.7**	ND<5.0	**1.0**	ND<1.0	ND<1.0	
8/15/2002		**53.11**	**6.56**	**1,500**	**130**	ND<170	**6.6**	**1.2**	**7.3**	**8.4**	**9.9**	ND<5.0	ND<1.0	ND<1.0	ND<1.0	
12/20/2002		**56.52**	**3.15**	**410**	ND<50	ND<170	ND<50	ND<50	ND<50	**0.50**	ND<1.0	ND<20	ND<1.0	ND<1.0	ND<1.0	
2/11/2003		**55.42**	**4.25**	**1,700**	**140**	ND<170	**13**	**4.6**	**17**	**4.8**	**15**	ND<20	**1.1**	ND<1.0	ND<1.0	**1,2-EDB=1.1**
5/13/2003		**54.79**	**4.88**	**320**	ND<50	ND<170	**3.1**	**1.5**	**5.9**	**2.4**	**1.8**	ND<20	ND<1.0	ND<1.0	ND<1.0	
8/14/2003		**52.47**	**7.20**	**1,700**	ND<50	ND<170	**7.0**	**1.3**	**7.7**	**3.5**	**13**	ND<20	**1.4**	ND<1.0	ND<1.0	
11/4/2003		**51.72**	**7.95**	**4,500**	**320**	ND<170	**31**	**3.8**	**17**	**12**	ND<70	ND<20	**2.8**	ND<1.0	ND<1.0	
2/2/2004		**56.71**	**2.96**	**80**	ND<50	ND<170	ND<50	ND<50	ND<50	ND<50	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	
5/4/2004		**54.27**	**5.40**	**130**	ND<50	ND<170	ND<50	ND<0.50	ND<50	ND<0.50	ND<1.0	ND<0.10	ND<1.0	ND<1.0	ND<1.0	
8/3/2004		**52.12**	**7.55**	**1,400**	**180**	ND<170	**4.7**	**0.87**	**3.7**	**1.5**	ND<6.0	ND<10	ND<1.0	ND<1.0	ND<1.0	
11/10/2004		**54.27**	**5.40**	**61**	ND<50	ND<170	ND<50	ND<0.50	ND<50	ND<0.50	ND<1.0	ND<0.10	ND<1.0	ND<1.0	ND<1.0	
MW-2	59.45															
8/4/2000		53.49	5.96	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**53.45**	**6.00**	**8,000**	**330**	ND<170	**160**	**8.6**	**34**	**49**	**790**	ND<50	**82**	ND<2.5	ND<2.5	
9/8/2000		52.62	6.83	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		52.12	7.33	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**53.98**	**5.47**	**8,600**	**510**	ND<170	**130**	**6.2**	**25**	**32**	**680**	**420**	**86**	ND<2.5	ND<2.5	
12/12/2000		54.59	4.86	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		54.87	4.58	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**54.68**	**4.77**	**8,200**	**590**	ND<170	**150**	**9.6**	**39**	**40**	**310**	ND<50	ND<5.0	ND<5.0	ND<5.0	
3/12/2001		55.04	4.41	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		54.91	4.54	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**54.65**	**4.80**	**8,000**	**950**	ND<200	**110**	**6.9**	**30**	**32**	**280**	ND<25	ND<2.5	ND<2.5	ND<2.5	

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-2 continued																
6/8/2001		54.42	5.03	---	---	---	---	---	---	---	---	---	---	---	---	---
7/16/2001		53.75	5.70	---	---	---	---	---	---	---	---	---	---	---	---	---
8/7/2001		**53.23**	**6.22**	**5,900**	**300**	ND<170	**47**	**4.5**	**17**	**19**	**180**	ND<25	ND<2.5	ND<2.5	ND<2.5	
9/17/2001		52.74	6.71	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		52.25	7.20	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**52.17**	**7.28**	**8,400**	**580**	ND<170	**100**	**8.7**	**33**	**33**	**160**	ND<50	**15**	ND<5.0	ND<5.0	
2/5/2002		---	---	**9,900**	**460**	---	**160**	**13**	**71**	**51**	**170**	**100**	**21**	ND<3.0	ND<3.0	
5/9/2002		**54.81**	**4.64**	**7,800**	**360**	ND<170	**100**	**8.6**	**44**	**37**	**54**	ND<30	**6.1**	ND<3.0	ND<3.0	
8/15/2002		**50.84**	**8.61**	**6,400**	**720**	ND<170	**110**	**11**	**42**	**44**	**65**	ND<40	**5.6**	ND<4	ND<4	
12/20/2002		**56.25**	**3.20**	**5,200**	**330**	ND<170	**20**	ND<5.0	**18**	**16**	ND<20	ND<200	ND<10	ND<10	ND<10	
2/11/2003		**54.93**	**4.52**	**7,900**	**610**	ND<170	**100**	**10**	**50**	**49.3**	ND<300	**92**	**10**	ND<1.0	ND<1.0	**1,2-EDB=1.1** **1,2-DCA=1.9**
5/13/2003		**55.39**	**4.06**	**6,200**	**600**	ND<170	**51**	**7.7**	**41**	**37.8**	ND<100	ND<20	**5.2**	ND<1.0	ND<1.0	**1,2-DCA=1.2**
8/14/2003		**52.40**	**7.05**	**9,400**	**810**	ND<170	**70**	**7.3**	**34**	**29.7**	ND<180	**31**	**7.6**	ND<1.0	ND<1.0	
11/4/2003	Well was inaccessible	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
2/2/2004		**56.17**	**3.28**	**5,900**	**730**	ND<170	**21**	**5.4**	**27**	**20.3**	ND<14	ND<10	**1.1**	ND<1.0	ND<1.0	
5/4/2004		**54.20**	**5.25**	**7,000**	**500**	ND<170	**60**	**11**	**51**	**40**	ND<45	ND<20	**2.4**	ND<1.0	ND<1.0	
8/3/2004		**52.13**	**7.32**	**7,300**	**740**	ND<170	**47**	**7.9**	**39**	**31.3**	ND<36	ND<10	**1.8**	ND<1.0	ND<1.0	
11/10/2004		**54.14**	**5.31**	**6,300**	**980**	ND<170	**32**	**6.3**	**34**	**27.2**	ND<15	ND<10	**1.0**	ND<1.0	ND<1.0	
MW-3	59.25															
8/4/2000		53.06	6.19	---	---	---	---	---	---	---	---	---	---	---	---	---
8/7/2000		**53.11**	**6.14**	**2,300**	**74**	ND<170	**4.3**	ND<4.0	ND<4.0	ND<4.0	**5,600**	**2,500**	**550**			
9/8/2000		52.58	6.67	---	---	---	---	---	---	---	---	---	---	---	---	---
10/12/2000				---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**53.46**	**5.79**	**2,000**	**59**	ND<170	ND<2.0	ND<2.0	ND<2.0	ND<2.0	**4,000**	**1,300**	**490**	ND<5.0	ND<5.0	
12/12/2000		53.85	5.40	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		53.94	5.31	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**54.32**	**4.93**	**1,900**	ND<50	ND<170	**7.6**	ND<5.0	ND<5.0	ND<5.0	**2,000**	ND<100	**200**	ND<10	ND<10	
3/12/2001		53.70	5.55	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		54.23	5.02	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**53.92**	**5.33**	**1,200**	**56**	ND<200	**1.4**	ND<1.3	ND<1.3	ND<1.3	**1100**	**270**	**130**	ND<2.5	ND<2.5	
6/8/2001		53.68	5.57	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		53.16	6.09	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2001		**52.95**	**6.30**	**740**	ND<50	ND<170	**5.1**	ND<1.3	ND<1.3	ND<1.3	**970**	**200**	**94**	ND<2.5	ND<2.5	
9/17/2001		52.75	6.50	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		52.22	7.03	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**51.92**	**7.33**	**880**	ND<50	ND<170	**1.5**	ND<1.0	ND<1.0	ND<1.0	**1,100**	**160**	**99**	ND<2.0	ND<2.0	
2/5/2002		**54.58**	**4.67**	**600**	ND<50	---	**0.74**	ND<0.50	ND<0.50	ND<0.50	**740**	**310**	**86**	**2.2**	ND<1.0	
5/9/2002		**54.23**	**5.02**	**920**	ND<50	ND<170	**5.3**	ND<0.50	**0.81**	ND<0.50	**470**	**100**	**40**	ND<1.0	ND<1.0	
8/15/2002		**52.96**	**6.29**	**590**	**71**	ND<170	**6.3**	**0.56**	**0.95**	**1.8**	**420**	**150**	**30**	**1.1**	ND<1.0	
12/20/2002		**54.97**	**4.28**	**99**	ND<50	ND<170	**0.90**	ND<0.50	ND<0.50	**0.59**	**91**	ND<70	**4**	ND<1.0	ND<1.0	

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-3 continued																
2/11/2003		**54.54**	**4.71**	**740**	ND<50	ND<170	**2.8**	**1.1**	ND<0.50	**5.06**	**720**	**300**	**57**	ND<1.0	ND<1.0	
5/13/2003		**54.96**	**4.29**	**1,300**	**220**	ND<170	**25.0**	**4.3**	**1.2**	**22.9**	**680**	**300**	**60**	ND<1.0	ND<1.0	
8/14/2003		**52.36**	**6.89**	**820**	**95**	ND<170	**3.4**	**0.7**	ND<0.50	**3.9**	**1,000**	**180**	**73**	ND<1.0	ND<1.0	
11/4/2003		**51.79**	**7.46**	**650**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	**1.54**	**940**	**78**	**65**	**1.2**	ND<1.0	
2/2/2004		**55.27**	**3.98**	**3,600**	**490**	ND<170	**26**	**1.4**	**0.81**	**6.4**	**180**	**79**	**15**	ND<1.0	ND<1.0	
5/4/2004		**53.84**	**5.41**	**2,200**	**310**	ND<170	**4.6**	**1.0**	ND<0.50	**2.58**	**81**	ND<40	**5.3**	ND<1.0	ND<1.0	
8/3/2004		**52.06**	**7.19**	**960**	**140**	ND<170	**0.68**	ND<0.50	ND<0.50	**1.32**	**220**	**42**	**14**	ND<1.0	ND<1.0	
11/10/2004		**53.31**	**5.94**	**910**	**190**	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**290**	ND<50	**19**	ND<1.0	ND<1.0	
MW-4	59.96															
8/4/2000		53.73	6.23	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**53.67**	**6.29**	**11,000**	**530**	ND<170	**900**	**32**	**69**	**159**	**620**		**45**	ND<1.0	ND<1.0	
9/8/2000		52.85	7.11	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		52.33	7.63	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**53.87**	**6.09**	**6,400**	**61**	ND<170	**600**	**20**	**80**	**82.5**	**180**	ND<100	ND<5.0	ND<5.0	ND<5.0	
12/12/2000		54.67	5.29	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		54.72	5.24	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**55.21**	**4.75**	**5,400**	**550**	ND<170	**540**	**12**	**47**	**38**	**140**	ND<100	ND<10	ND<10	ND<10	
3/12/2001		55.44	4.52	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		55.21	4.75	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**54.96**	**5.00**	**6,200**	**920**	ND<200	**620**	**24**	**120**	**76.2**	**210**	ND<50	ND<5.0	ND<5.0	ND<5.0	
6/8/2001		54.84	5.12	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		54.04	5.92	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2001		**53.43**	**6.53**	**5,900**	**520**	**570**	**660**	**26**	**130**	**98.8**	**190**	ND<100	ND<10	ND<10	ND<10	
9/17/2001		52.96	7.00	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		52.39	7.57	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**52.36**	**7.60**	**7,200**	**200**	ND<170	**670**	**30**	**100**	**77**	**120**	ND<100	ND<10	ND<10	ND<10	
2/5/2002		**55.56**	**4.40**	**4,800**	**83**	---	**340**	**14**	**48**	**27**	**100**	**32**	**5.8**	ND<3.0	ND<3.0	
5/9/2002		**55.47**	**4.49**	**3,800**	**260**	ND<170	**300**	**19**	**74**	**48.6**	**52**	ND<30	ND<3.0	ND<3.0	ND<3.0	
8/15/2002		**54.07**	**5.89**	**4,700**	**280**	ND<170	**350**	**21**	**82**	**46.7**	**81**	ND<50	ND<5.0	ND<5.0	ND<5.0	
12/20/2002		**55.80**	**4.16**	**6,900**	**260**	ND<170	**430**	**32**	**97**	**52**	ND<150	ND<1000	ND<50	ND<50	ND<50	
2/11/2003		**55.58**	**4.38**	**5,700**	**64**	ND<170	**430**	**24**	**57**	**55.9**	**500**	**230**	**28**	**1.1**	ND<1.0	**1,2-DCA=1.3**
5/13/2003		**54.91**	**5.05**	**5,500**	**500**	ND<170	**360**	**27**	**85**	**65.7**	ND<200	**47**	**8.1**	ND<1.0	ND<1.0	**1,2-DCA=1.0**
8/14/2003		**52.90**	**7.06**	**7,400**	**440**	ND<170	**480**	**22**	**79**	**47.4**	**120**	**51**	**5.6**	**1.1**	ND<1.0	
11/4/2003		**52.01**	**7.95**	**10,000**	**700**	ND<170	**600**	**35**	**110**	**71.8**	ND<150	ND<20	**4.4**	ND<1.0	ND<1.0	**1,2-DCA=1.0**
2/2/2004		**56.19**	**3.77**	**8,400**	**740**	ND<170	**450**	**27**	**85**	**63**	ND<150	ND<60	**4.6**	ND<1.0	ND<1.0	
5/4/2004		**54.77**	**5.19**	**3,500**	**120**	ND<170	**74**	**8.5**	**26**	**27.1**	ND<80	ND<50	**2.0**	ND<1.0	ND<1.0	
8/3/2004		**52.65**	**7.31**	**420**	ND<50	ND<170	**4.3**	**0.66**	**2.1**	**1.9**	ND<1.0	ND<10	ND<1.0	ND<1.0	ND<1.0	
11/10/2004		**54.16**	**5.80**	**190**	ND<50	ND<170	**1.1**	ND<0.50	**0.95**	**0.99**	ND<2.0	ND<10	ND<1.0	ND<1.0	ND<1.0	
MW-5	59.47															
8/4/2000		53.10	6.37	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**53.31**	**6.16**	**23,000**	**1,900**	ND<170	**3,600**	**61**	**590**	**1,556**	**4,500**	ND<500	ND<25	ND<25	ND<25	

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-5 continued																
9/8/2000		53.02	6.45	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		52.47	7.00	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**53.59**	**5.88**	**17,000**	**1,200**	**930**	**2,500**	**60**	**800**	**940**	**2,300**	ND<500	ND<25	ND<25	ND<25	
12/12/2000		54.28	5.19	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		54.26	5.21	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**54.45**	**5.02**	**17,000**	**890**	ND<170	**2,600**	**49**	**370**	**320**	**2,300**	ND<500	ND<50	ND<50	ND<50	
3/12/2001		54.83	4.64	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		54.76	4.71	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**54.56**	**4.91**	**14,000**	**1,300**	ND<200	**2,300**	**48**	**510**	**555**	**1,700**	ND<500	ND<25	ND<25	ND<25	
6/8/2001		54.45	**5.02**	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		53.68	**5.79**	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2001		**53.33**	**6.14**	**14,000**	**1,100**	**330**	**2,200**	**52**	**390**	**420**	**2,000**	ND<250	ND<25	ND<25	ND<25	
9/17/2001		52.98	6.49	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		52.48	6.99	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**52.34**	**7.13**	**20,000**	**1,100**	**420**	**2,500**	**48**	**550**	**493**	**2,300**	**550**	**21**	ND<20	ND<20	
2/5/2002		**55.26**	**4.21**	**15,000**	**660**	---	**2,100**	**42**	**390**	**391**	**2,200**	**890**	**48**	ND<20	ND<20	
5/9/2002		**54.76**	**4.71**	**10,000**	**810**	**210**	**1,400**	**33**	**260**	**270**	**790**	ND<200	**21**	ND<20	ND<20	
8/15/2002		**53.68**	**5.79**	**13,000**	**1,300**	**960**	**1,200**	**33**	**210**	**280**	**910**	ND<200	**24**	ND<20	ND<20	
12/20/2002		**55.23**	**4.24**	**40,000**	**6,900**	**13,000**	**1,800**	**51**	**460**	**380**	ND<1800	ND<1000	ND<50	ND<50	ND<50	
																1,2-DCA=2.7
2/11/2003		**56.06**	**3.41**	**13,000**	**880**	**1,200**	**1,500**	**34**	**200**	**239.7**	**710**	**230**	**25**	**3.5**	ND<1.0	**1,2-EDB=1.0**
5/13/2003		**54.79**	**4.68**	**13,000**	**1,100**	**1,100**	**1,000**	**33**	**230**	**230**	**590**	ND<1000	ND<50	ND<50	ND<50	
8/14/2003		**53.09**	**6.38**	**18,000**	**1,500**	**610**	**1,700**	**44**	**340**	**240**	**760**	ND<1000	ND<50	ND<50	ND<50	
11/4/2003		**52.25**	**7.22**	**52,000**	**37,000**	**56,000**	**1,500**	**33**	**340**	**259.4**	ND<1200	ND<200	**17**	ND<10	ND<10	
2/2/2004		**56.17**	**3.30**	**19,000**	**2,200**	**300**	**1,300**	**29**	**240**	**208.1**	**680**	**99**	**16**	ND<5.5	ND<1.0	**1,2-DCA = 2.3**
5/4/2004		**54.59**	**4.88**	**31,000**	**6,500**	**5,100**	**1,500**	**37**	**310**	**217.4**	ND<1000	**82**	**14**	**2.3**	ND<10	
8/3/2004		**52.92**	**6.55**	**21,000**	**2,900**	**1,100**	**1,600**	**32**	**220**	**160**	**530**	ND<500	ND<50	ND<50	ND<50	
11/10/2004		**54.14**	**5.33**	**140,000**	**25,000**	**12,000**	**830**	**20**	**50**	**401**	ND<850	**59**	**8**	**2**	ND<1.0	
SHALLOW																
MW-6	60.06															
8/4/2000		52.86	7.20	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**52.14**	**7.92**	**1,200**	**140**	ND<170	**2.6**	ND<2.5	**1.1**	**1.9**	**820**			**5.4**	**3.0**	
9/8/2000		51.64	8.42	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		50.96	9.10	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**51.51**	**8.55**	**670**	ND<50	ND<170	**1.6**	ND<0.5	ND<0.5	**0.65**	**900**	**130**	**10**	**8.8**	**5.0**	**1,2 DCA=8.5**
12/12/2000		53.24	6.82	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		52.99	7.07	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**53.55**	**6.51**	**900**	ND<50	ND<170	ND<2.5	ND<2.5	ND<2.5	ND<2.5	**1,200**	ND<50	**35**	**7.8**	ND<5.0	**1,2 DCA=7.3**
3/12/2001		52.75	7.31	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		55.35	4.71	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**52.49**	**7.57**	**570**	**51**	ND<200	**1.5**	ND<2.5	ND<2.5	ND<2.5	**860**	**68**	**37**	**5.0**	ND<2.5	**1,2 DCA=4.6**
6/8/2001		52.34	**7.72**	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		52.24	**7.82**	---	---	---	---	---	---	---	---	---	---	---	---	

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-6 continued																
8/7/2001		**51.91**	**8.15**	**680**	ND<50	ND<170	ND<1.3	ND<1.3	ND<1.3	ND<1.3	**1,100**	**200**	**38**	**6.4**	**2.6**	**1,2 DCA=4.9**
9/17/2001		51.59	8.47	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		51.06	9.00	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**50.84**	**9.22**	**750**	ND<50	ND<170	ND<1.0	ND<1.0	ND<1.0	ND<1.0	**910**	**150**	**35**	**4.9**	**2.1**	**1,2 DCA=3.9**
2/5/2002		**54.17**	**5.89**	**710**	ND<50	---	ND<1.0	ND<1.0	ND<1.0	ND<1.0	**1,300**	**350**	**92**	**7.8**	**3.1**	**Pb Scavs=3.7**
5/9/2002		**53.79**	**6.27**	**630**	ND<50	---	ND<1.5	ND<1.5	ND<1.5	ND<1.5	**1,100**	**160**	**54**	**3.5**	ND<3.0	**Pb Scavs=3.5**
8/15/2002		**52.88**	**7.18**	**930**	ND<50	ND<170	ND<1.0	ND<1.0	ND<1.0	**1.7**	**980**	**160**	**54**	**5.1**	**2.3**	
12/20/2002		**54.47**	**5.59**	**910**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**1,200**	**480**	**64**	**4.9**	**2.7**	**1,2-DCA=4.0**
2/11/2003		**54.39**	**5.67**	**1,100**	ND<50	ND<170	**0.58**	ND<0.50	ND<0.50	ND<0.50	**1,300**	**450**	**74**	**5.2**	ND<4.0	**1,2-DCA=3.6**
5/13/2003		**54.53**	**5.53**	**380**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**960**	**180**	**62**	**3.6**	**1.5**	**1,2-DCA=3.1**
8/14/2003		**51.35**	**8.71**	**720**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**1,000**	**210**	**72**	**4.8**	**2.1**	**1,2-DCA=2.4**
11/4/2003		**49.54**	**10.52**	**670**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**1,000**	**190**	**58**	**3.5**	**1.7**	**1,2-DCA=2.3**
2/2/2004		**53.95**	**6.11**	**1,100**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**1,100**	**270**	**64**	ND<8.0	**2.0**	
5/4/2004		**52.16**	**7.90**	**450**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**480**	**55**	**29**	**1.8**	ND<1.0	
8/3/2004		**50.44**	**9.62**	**160**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**180**	ND<22	**6.9**	ND<1.0	ND<1.0	
11/10/2004		**51.64**	**8.42**	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**30**	ND<10	ND<1.0	ND<1.0	ND<1.0	
MW-7	59.80															
8/4/2000		53.63	6.17	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**53.60**	**6.20**	**3,700**	**190**	ND<170	**33**	**2.8**	**2**	**67.4**	**3,000**	**700**	**220**			
9/8/2000		52.97	6.83	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		52.35	7.45	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**53.50**	**6.30**	**910**	**110**	ND<170	**2.2**	ND<1.0	**1.2**	**1.9**	**1,200**	**280**	**90**	**4.2**	ND<2.5	
12/12/2000		53.78	6.02	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		54.13	5.67	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**54.39**	**5.41**	**1,700**	**170**	**280**	**5.2**	ND<5.0	ND<5.0	ND<5.0	**1,800**	**440**	**160**	ND<10	ND<10	
3/12/2001		54.73	5.07	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		54.61	5.19	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**54.39**	**5.41**	**1,100**	**160**	ND<200	**6.6**	ND<5.0	ND<5.0	ND<5.0	**2,000**	**450**	**200**	ND<5.0	ND<5.0	
6/8/2001		54.17	**5.63**	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		54.00	**5.80**	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2001		**53.70**	**6.10**	**1,400**	ND<50	ND<170	**8.3**	ND<5.0	ND<5.0	ND<5.0	**2,100**	**670**	**180**	ND<10	ND<10	
9/17/2001		53.39	6.41	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		52.85	6.95	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**52.63**	**7.17**	**1,400**	ND<50	ND<170	ND<1.5	ND<1.5	ND<1.5	ND<1.5	**1,800**	**430**	**150**	**4.6**	ND<3.0	
2/5/2002		**55.40**	**4.40**	**1,500**	ND<50	---	**31**	ND<1.5	ND<1.5	ND<1.5	**2,000**	**750**	**190**	**7.9**	**3.8**	**1,2-DCA=3.3**
5/9/2002		**54.88**	**4.92**	**1,100**	ND<50	ND<170	**51**	ND<2.5	ND<2.5	ND<2.5	**1,800**	**280**	**96**	ND<5.0	ND<5.0	
8/15/2002		**53.06**	**6.74**	**1,500**	**53**	ND<170	**4.6**	ND<1.5	ND<1.5	**2.6**	**1,500**	**290**	**110**	**5.3**	ND<3.0	
12/20/2002		**55.83**	**3.97**	**750**	ND<50	ND<170	**0.64**	ND<0.50	ND<0.50	**0.57**	**1,200**	**510**	**78**	**3.4**	ND<1.0	**1,2-DCA=1.3**
2/11/2003		**55.32**	**4.48**	**1,400**	ND<50	ND<170	**36**	**0.69**	**0.74**	**0.61**	**1,300**	**550**	**78**	ND<8.0	ND<4.0	**1,2-DCA=2.8**
5/13/2003		**53.78**	**6.02**	**620**	ND<50	ND<170	**18**	**0.64**	**0.79**	**1.21**	**1,000**	**190**	**64**	**3.4**	**1.9**	**1,2-DCA=2.7**

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-7 continued																
8/14/2003		**52.90**	**6.90**	**830**	**54**	ND<170	**1.4**	ND<0.50	ND<0.50	ND<0.50	**1,100**	**250**	**85**	**4.0**	**1.1**	
11/4/2003		**52.04**	**7.76**	**570**	ND<50	ND<170	**1.4**	ND<0.50	ND<0.50	ND<0.50	**780**	**140**	**48**	**2.7**	ND<1.0	**1,2-DCA=1.2**
2/2/2004		**55.82**	**3.98**	**1,300**	**50**	ND<170	**7.6**	ND<0.50	**0.56**	ND<0.50	**1,200**	**240**	**69**	**4.6**	ND<4.5	**1,2-DCA = 2.2**
5/4/2004		**54.43**	**5.37**	**800**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**870**	ND<50	**67**	**2.8**	ND<1.0	
8/3/2004		**52.23**	**7.57**	**710**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**720**	**42**	**48**	**2.4**	ND<1.0	
11/10/2004		**53.67**	**6.13**	ND<50	**56**	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**7.0**	ND<10	ND<1.0	ND<1.0	ND<1.0	
MW-8	59.58															
8/4/2000		52.05	7.53	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2000		**50.81**	**8.77**	**4,800**	**98**	ND<170	ND<10	ND<10	ND<10	ND<10	**11,000**	**2,100**	**36**	**54**		**1,2 DCA=42**
9/8/2000		51.60	7.98	---	---	---	---	---	---	---	---	---	---	---	---	
10/12/2000		51.17	8.41	---	---	---	---	---	---	---	---	---	---	---	---	
11/3/2000		**52.58**	**7.00**	**3,200**	**65**	ND<170	ND<4.0	ND<4.0	ND<4.0	ND<4.0	**7,800**	**1,300**	**50**	**56**	ND<10	
12/12/2000		52.82	6.76	---	---	---	---	---	---	---	---	---	---	---	---	
1/8/2001		52.77	6.81	---	---	---	---	---	---	---	---	---	---	---	---	
2/6/2001		**53.29**	**6.29**	**5,700**	ND<50	ND<170	ND<10	ND<10	ND<10	ND<10	**8,000**	**1,100**	**61**	**47**	ND<20	
3/12/2001		53.66	5.92	---	---	---	---	---	---	---	---	---	---	---	---	
4/20/2001		53.26	6.32	---	---	---	---	---	---	---	---	---	---	---	---	
5/8/2001		**52.85**	**6.73**	**4,600**	ND<50	ND<200	ND<6.3	ND<6.3	ND<6.3	ND<6.3	**6,900**	**620**	**83**	**35**	ND<13	
6/8/2001		52.70	**6.88**	---	---	---	---	---	---	---	---	---	---	---	---	
7/16/2001		52.58	**7.00**	---	---	---	---	---	---	---	---	---	---	---	---	
8/7/2001		**51.61**	**7.97**	**4,700**	ND<50	ND<170	ND<13	ND<13	ND<13	ND<13	**7,600**	ND<250	**120**	**41**	ND<25	
9/17/2001		50.80	8.78	---	---	---	---	---	---	---	---	---	---	---	---	
10/24/2001		50.28	9.30	---	---	---	---	---	---	---	---	---	---	---	---	
11/6/2001		**50.68**	**8.90**	**4,800**	ND<50	ND<170	ND<10	ND<10	ND<10	ND<10	**7,000**	**920**	**98**	**37**	ND<20	
2/5/2002		**53.62**	**5.96**	**2,600**	ND<50	---	ND<5.0	ND<5.0	ND<5.0	ND<5.0	**6,200**	**860**	**170**	**37**	ND<10	
5/9/2002		**53.05**	**6.53**	**2,800**	ND<50	ND<170	ND<5.0	ND<5.0	ND<5.0	ND<5.0	**6,500**	**850**	**130**	**24**	ND<10	
8/15/2002		**52.25**	**7.33**	**4,400**	ND<50	ND<170	ND<5.0	ND<5.0	ND<5.0	ND<5.0	**5,600**	**820**	**160**	**33**	ND<10	
12/20/2002		**53.52**	**6.06**	**3,100**	ND<50	ND<170	**0.63**	ND<0.50	ND<0.50	**0.62**	**5,700**	ND<6000	**160**	**31**	**4**	**1,2-DCA=3.0**
2/11/2003		**54.41**	**5.17**	**4,500**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**6,200**	**1,800**	**110**	**29.0**	**4.0**	**1,2-DCA=3.7**
5/13/2003		**53.56**	**6.02**	**950**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**4,500**	**1,100**	**140**	**20.0**	**2.5**	**1,2-DCA=3.0**
8/14/2003		**50.53**	**9.05**	**1,300**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**4,600**	**1,100**	**150**	**24.0**	**3.2**	**1,2-DCA=2.2**
11/4/2003		**50.70**	**8.88**	**1,500**	ND<50	ND<170	**1.5**	ND<0.50	**0.51**	ND<0.50	**4,700**	**1,100**	**130**	**21**	**2.9**	**1,2-DCA=2.3**
2/2/2004		**53.82**	**5.76**	**4,200**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**4,700**	**1,000**	**150**	**21**	**3.1**	**1,2-DCA = 3.0**
5/4/2004		**52.56**	**7.02**	**2,900**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**4,300**	**1,100**	**140**	**20**	**3.1**	
8/3/2004		**49.60**	**9.98**	**3,000**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**4,100**	**920**	**110**	**17**	**2.7**	
11/10/2004		**49.26**	**10.32**	**3,100**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**3,500**	**810**	**110**	**14**	ND<4.0	
MW-9	59.35															
11/6/2001		**46.34**	**13.01**	**160**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**210**	ND<5.0	**17**	ND<1.0	ND<1.0	
2/5/2002		**52.11**	**7.24**	**92**	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**210**	ND<5.0	**20**	ND<1.0	ND<1.0	
5/9/2002		**49.62**	**9.73**	**88**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**180**	ND<5.0	**13**	ND<1.0	ND<1.0	
8/15/2002		**49.90**	**9.45**	**100**	ND<50	ND<170	ND<0.50	ND<0.50	**0.69**	**1.8**	**81**	ND<5.0	**7.1**	ND<1.0	ND<1.0	
12/20/2002		**51.46**	**7.89**	ND<50	---	---	ND<0.50	ND<0.50	ND<0.50	**0.53**	**30**	ND<20	**1.8**	ND<1.0	ND<1.0	
2/11/2003		**53.66**	**5.69**	**51**	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	**29**	ND<20	**1.8**	ND<1.0	ND<1.0	

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-9 continued																
5/13/2003		52.43	6.92	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	10	ND<20	ND<1.0	ND<1.0	ND<1.0	
8/14/2003		49.68	9.67	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	12	ND<20	1.1	ND<1.0	ND<1.0	
11/4/2003		49.12	10.23	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	21	ND<20	1.5	ND<1.0	ND<1.0	
2/2/2004		52.79	6.56	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	10	ND<10	ND<1.0	ND<1.0	ND<1.0	
5/4/2004		51.06	8.29	76	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	7.8	ND<10	ND<1.0	ND<1.0	ND<1.0	
8/3/2004		49.48	9.87	65	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	5.1	ND<10	ND<1.0	ND<1.0	ND<1.0	
11/10/2004		50.28	9.07	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	6.8	ND<10	ND<1.0	ND<1.0	ND<1.0	
MW-10	59.19															
11/6/2001		48.64	10.55	61	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	82	17	2.9	ND<1.0	ND<1.0	
2/5/2002		52.12	7.07	55	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	47	11	ND<1.0	ND<1.0	ND<1.0	
5/9/2002		51.17	8.02	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	34	ND<5.0	ND<1.0	ND<1.0	ND<1.0	
8/15/2002		48.04	11.15	87	ND<50	ND<170	ND<0.50	ND<0.50	1.3	3.4	41	ND<5.0	ND<1.0	ND<1.0	ND<1.0	
12/20/2002		51.68	7.51	53	190	2,800	ND<0.50	ND<0.50	ND<0.50	ND<0.50	63	ND<20	2.2	ND<1.0	ND<1.0	
2/11/2003		45.71	13.48	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	44	ND<20	1.4	ND<1.0	ND<1.0	
5/13/2003		48.49	10.70	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	15	ND<20	ND<1.0	ND<1.0	ND<1.0	
8/14/2003		47.55	11.64	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	38	ND<20	1.9	ND<1.0	ND<1.0	
11/4/2003		46.54	12.65	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	45	ND<20	2.3	ND<1.0	ND<1.0	
2/2/2004		48.11	11.08	86	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	52	ND<20	2.5	ND<1.0	ND<1.0	
5/4/2004		47.69	11.50	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	15	ND<10	ND<1.0	ND<1.0	ND<1.0	
8/3/2004		46.27	12.92	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	17	ND<10	ND<1.0	ND<1.0	ND<1.0	
11/10/2004		46.58	12.61	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	28	ND<10	1.4	ND<1.0	ND<1.0	
MW-11	59.21															
11/6/2001		47.85	11.36	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	10	ND<50	ND<1.0	ND<1.0	ND<1.0	
2/5/2002		50.97	8.24	ND<50	ND<50	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	6.3	ND<50	ND<1.0	ND<1.0	ND<1.0	
5/9/2002		50.45	8.76	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.1	ND<50	ND<1.0	ND<1.0	ND<1.0	
8/15/2002		48.00	11.21	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	0.52	1.2	0.9	ND<5.0	ND<1.0	ND<1.0	ND<1.0	
12/20/2002		51.92	7.29	ND<50	ND<50	240	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.4	ND<20	ND<1.0	ND<1.0	ND<1.0	
2/11/2003		50.79	8.42	ND<50	ND<50	230	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.8	ND<20	ND<1.0	ND<1.0	ND<1.0	
5/13/2003		51.24	7.97	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1	ND<20	ND<1.0	ND<1.0	ND<1.0	
8/14/2003		48.11	11.10	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.1	ND<20	ND<1.0	ND<1.0	ND<1.0	
11/4/2003		45.99	13.22	ND<50	ND<50	270	ND<0.50	ND<0.50	ND<0.50	ND<0.50	9.2	ND<20	ND<1.0	ND<1.0	ND<1.0	
2/2/2004		51.18	8.03	52	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	18	ND<10	ND<1.0	ND<1.0	ND<1.0	
5/4/2004		50.04	9.17	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.7	ND<10	ND<1.0	ND<1.0	ND<1.0	
8/3/2004		47.41	11.80	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.8	ND<10	ND<1.0	ND<1.0	ND<1.0	
11/10/2004		49.59	9.62	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.7	ND<10	ND<1.0	ND<1.0	ND<1.0	
										avg	4.5					
MW-12	59.09															
11/6/2001		48.05	11.04	1,700	ND<50	ND<170	ND<2.5	ND<2.5	ND<2.5	ND<2.5	2,400	250	51	11	ND<1.0	
2/5/2002	Well was inaccessible	---	---	---	---	---	---	---	---	---		---	---	---	---	
5/9/2002		50.67	8.42	1,300	ND<50	ND<170	ND<2.5	ND<2.5	ND<2.5	ND<2.5	2,900	110	75	6.3	ND<5.0	
8/15/2002		48.97	10.12	1,800	ND<50	ND<170	ND<2.5	ND<2.5	ND<2.5	ND<2.5	2,300	96	92	9.4	ND<5.0	
12/20/2002		52.42	6.67	1,800	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2,600	430	94	9.0	3.3	
2/11/2003	Well was inaccessible	---	---	---	---	---	---	---	---	---		---	---	---	---	
5/13/2003		51.41	7.68	470	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,400	94	72	5.0	1.7	

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)
MW-12 continued																
8/14/2003		48.71	10.38	740	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,600	76	82	6.6	2.3	
11/4/2003		48.20	10.89	840	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,600	ND<50	68	4.7	1.9	
2/2/2004		51.69	7.40	1,500	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,700	ND<60	72	5.6	2.3	
5/4/2004		50.28	8.81	1,200	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,400	ND<45	69	4.5	1.8	
8/3/2004		48.34	10.75	2,100	76	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,300	110	96	9.5	2.7	
11/10/2004		49.78	9.31	1,200	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1,200	45	47	3.4	1.6	
										avg	1,855					
MW-13	58.86															
11/6/2001		48.82	10.04	2,000	ND<50	ND<170	ND<2.5	ND<2.5	ND<2.5	ND<2.5	2,800	330	110	9.8	ND<5.0	
2/5/2002		51.58	7.28	1,300	ND<50	---	ND<1.5	ND<1.5	ND<1.5	ND<1.5	2,800	370	160	11.0	4.0	
5/9/2002	Well was inaccessible	---	---	---	---	---	---	---	---	---		---	---	---	---	
8/15/2002		51.01	7.85	1,000	ND<50	ND<170	ND<1.0	ND<1.0	ND<1.0	1.3	1,200	51	70	5.7	ND<2.0	
12/20/2002		53.68	5.18	ND<50	54	570	ND<0.50	1.0	ND<0.50	ND<0.50	38	ND<20	1.8	ND<1.0	ND<1.0	
2/11/2003	Well was inaccessible	---	---	---	---	---	---	---	---	---		---	---	---	---	
5/13/2003		52.06	6.80	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	21	ND<20	1.9	ND<1.0	ND<1.0	
8/14/2003		49.48	9.38	160	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	260	ND<20	13	ND<1.0	ND<1.0	
11/4/2003		49.12	9.74	170	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	210	ND<20	13	ND<1.0	ND<1.0	
2/2/2004		52.09	6.77	330	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	360	ND<20	13	ND<2.5	ND<1.0	
5/4/2004		50.89	7.97	270	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	280	ND<10	12	ND<2.5	ND<1.0	
8/3/2004		49.13	9.73	960	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	820	ND<100	34	2.2	1.3	
11/10/2004		50.52	8.34	400	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	370	ND<25	16	ND<2.0	ND<1.0	
										avg	833					
MW-14	61.04															
11/10/2004		53.89	7.15	1,100	150	ND<170	0.62	ND<0.50	1.2	ND<0.50	ND<30	ND<20	1.7	ND<1.0	ND<1.0	
MW-15	60.80															
11/10/2004		54.37	6.43	1,600	90	ND<170	97	2.7	15	6.3	70	ND<40	2.6	ND<1.0	ND<1.0	
MW-16	60.24															
11/10/2004		54.45	5.79	3,900	200	ND<170	480	13	22	31.9	500	61	12	5.2	ND<1.0	
MW-17S	56.96															
11/10/2004		35.70	21.26	64	---	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	33	ND<35	ND<1.0	ND<1.0	ND<1.0	
MW-17D	56.95															
11/10/2004		32.42	24.53	ND<50	ND<50	ND<170	ND<0.50	ND<0.50	ND<0.50	ND<0.50	5.0	ND<20	ND<1.0	ND<1.0	ND<1.0	
Field Duplicate																
8/7/01 (MW-5)		---	---	14,000	---	---	2,100	52	350	434	2,000					
11/6/01 (MW-5)		---	---	20,000	---	---	2,500	46	520	462	2,200	510	22			
2/5/02 (MW-2)		---	---	8,900	---	---	150	11	56	39	180	100	23			
5/9/2002 (MW-5)		---	---	10,000	---	---	11,400	33	280	250	780		21			
/15/2002 (MW-10)		---	---	67	---	---	ND<0.50	ND<0.50	0.90	2.2	38		1.7			
12/20/02(MW-11)		---	---	ND<50	---	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.4					
2/11/03 (MW-10)		---	---	50	---	---	ND<0.50	ND<0.50	ND<0.50	ND<0.50	47		1.5			
8/14/03 (MW4)		---	---	7,100	---	---	450	23	81	47.5	120	28	5.7	1.1	ND<1.0	
11/4/03 (MW8)		---	---	1,500	---	---	1.5	ND<0.50	0.53	ND<0.50	4,600	1,200	130	20	2.8	1,2-DCA=2.4

TABLE 3: WELL DATA AND GROUNDWATER ANALYTICAL RESULTS
Fortuna Shell, 819 Main St, Fortuna, California
LACO Project No. 4563.01; LOP No. 12672

	Groundwater Measurements			Analytical Results												
WELL Sample Date	Well Head Elevation (feet NAVD 88)	Hydraulic Head Elevation (feet NAVD 88)	Depth to Water (feet)	TPHg (µg/L)	TPHd (µg/L)	TPHmo (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)	TAME (µg/L)	ETBE (µg/L)	DIPE (µg/L)	Other Analytes (µg/L)

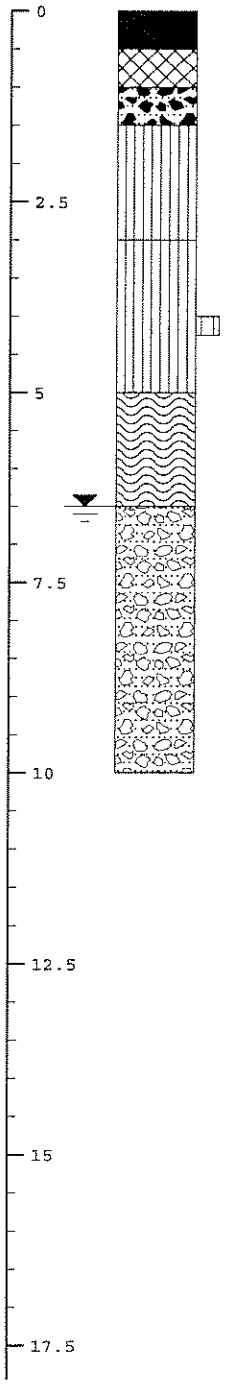
NOTES:
TPHg - total petroleum hydrocarbons as gasoline
TPHd - total petroleum hydrocarbons as diesel
TPHmo - total petroleum hydrocarbons as motor oil
xylenes = sum of m,p-xylene and 0-xylene
MTBE - methyl tertiary butyl ether
Other Analytes Include the fuel oxygenates and lead scavengers:
TAME - tertiary amyl methyl ether
TBA - tertiary butyl alcohol
DIPE - di-isopropyl ether
ETBE - ethyl tertiary butyl ether
Methanol, ethanol
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,2-dichloroethane (1,2 DCA)
Ethylene dibromide (EDB)

--- sample not analyzed for parameter
ND<50 - non-detect at reporting limits shown
Bold results indicate analyte detection

Attachment 1

Well No. MW-14

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: EAST OF NORTHERN PUMP ISLAND
DATE: 9/21/04
DRILLING METHOD: GEOPROBE
ELEVATION: Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: CJW
DEPTH TO WATER: **INITIAL** ▽: NA **COMPLETION** ▼: 6.5
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 5'-10'
SEAL AND INTERVAL: BENTONITE 1.5'-5'
SAND PACK AND INTERVAL: 5'-10' #2/16



ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
			CONCRETE			
			GRAVEL BASE			
		SW	WELL GRADED SAND WITH GRAVEL; gray, dense, moist;			
		ML	50% well graded sand, 50% fine gravel. No hydrocarbon odor or staining.	25		
			SILT; dark gray to black, firm, moist; 20% clay, 80% silt, low to medium plasticity, trace organics. Slight hydrocarbon odor.			
		ML	SILT: blue gray, firm, moist; 20% clay, 80% silt, low to medium plasticity. Slight hydrocarbon odor.			
				8		
		OL	SILT: black, soft to firm, moist; 30% clay, 70% silt, organic laden. Slight hydrocarbon odor.			
		SW	WELL GRADED SAND WITH GRAVEL: dark brown to blue gray, medium dense, wet to saturated; 5% clay, 20% silt, 50% well graded sand, 25% fine gravel. Slight hydrocarbon odor.	12		
			HALT AT 10 FEET BGS IN SAME.			

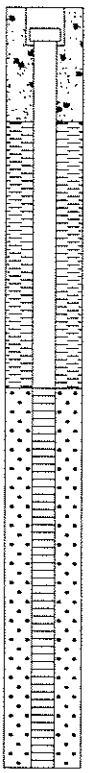
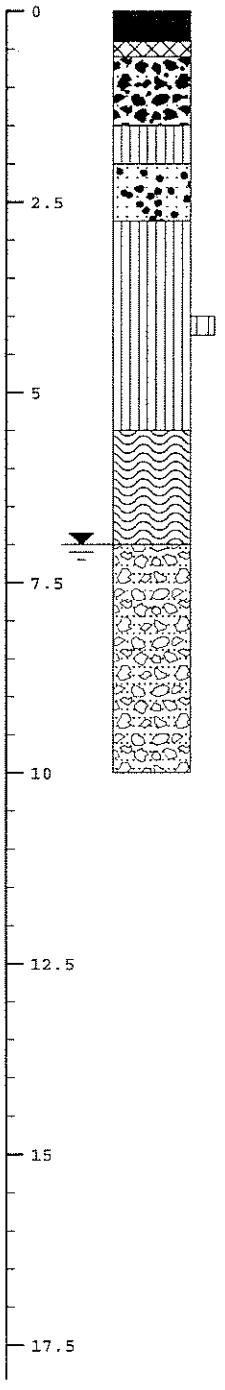


Figure _____

M 15

Well No. **MW-15**

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: EAST OF SOUTHERN PUMP ISLAND
DATE: 9/21/04
DRILLING METHOD: GEOPROBE
ELEVATION: Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: CJW
DEPTH TO WATER: **INITIAL** ▽: NA **COMPLETION** ▼: 7
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 5'-10'
SEAL AND INTERVAL: BENTONITE 1.5'-5'
SAND PACK AND INTERVAL: 5'-10' #2/16



ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
			CONCRETE			
		GW	GRAVEL BASE			
		ML	POORLY GRADED GRAVEL WITH SAND; gray, medium dense, moist; 5% clay, 20% silt, 25% well graded sand, 50% fine gravel. Slight motor oil odor.	17		
		GP	SILT; dark gray, firm, moist; 15% clay, 85% silt, low plasticity. Slight hydrocarbon and motor oil odor.			
		ML	POORLY GRADED GRAVEL WITH SAND; gray, medium dense, moist; 5% clay, 20% silt, 25% well graded sand, 50% fine gravel. Slight hydrocarbon and motor oil odor.	14		
			SILT: blue gray, firm, moist; 20% clay, 80% silt, medium plasticity. Slight hydrocarbon odor.			
		OL	SILT: black, soft to firm, wet; 30% clay, 70% silt, organic laden. Slight hydrocarbon odor.	7		
		SW	WELL GRADED SAND WITH GRAVEL: olive gray, medium dense, wet to saturated; 5% clay, 20% silt, 50% well graded sand, 25% fine gravel. Strong hydrocarbon odor.	377		
			HALT AT 10 FEET BGS IN SAME.	361		

Figure _____

Well No. **MW-16**

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: BETWEEN PUMP ISLANDS
DATE: 9/21/04
DRILLING METHOD: GEOPROBE
ELEVATION: Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: CJW
DEPTH TO WATER: **INITIAL** ▽: NA **COMPLETION** ▼: 7
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 5'-10'
SEAL AND INTERVAL: BENTONITE 1.5'-5'
SAND PACK AND INTERVAL: 5'-10' #2/16

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
0			CONCRETE			
			ASPHALT CONCRETE BASEROCK			
2.5						
		GW-SW	WELL GRADED GRAVEL WITH SAND; gray, dense, moist; 50% well graded sand, 50% well graded gravel. Hydrocarbon odor.	372		
5						
		SW-SM	WELL GRADED SAND WITH SILT AND GRAVEL; olive gray, medium dense, wet; 5% clay, 20% silt, 50% well graded sand, 25% fine gravel. Strong hydrocarbon odor.	459		
7.5						
			color change to strong yellow brown.			
10			HALT AT 10 FEET BGS IN SAME.	8		
12.5						
15						
17.5						

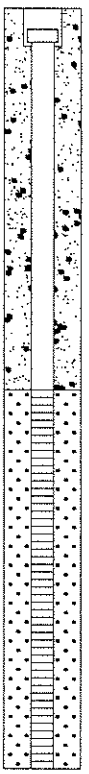


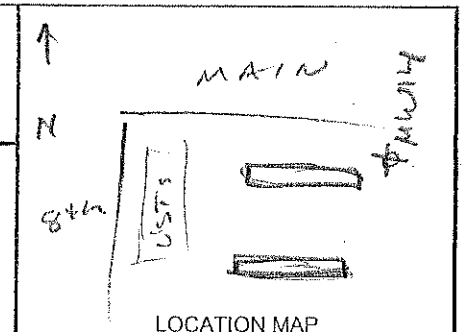
Figure _____

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: HPI FORTUNA GAS 4 LESS
PROJECT NO.: 4563.07
DATE: 9/21/04
DRILLER: LAKES
PM: CJW
LOGGED BY: CJW

GLOBAL ID:
FIELD POINT NAME: 4503-MW14
DRILLING METHOD: DIRECT PUSH
AUGER/ROD DIAMETER (in): 1.5/3.25
LOCATION: EAST OF N. PUMP ISLAND
ELEVATION (ft):



LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	%CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	%SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VD=VERY DENSE	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
0 0.5	CONC. BASE			N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	HAND AUGER to 3'
1.0	GRAY	/	/	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	/	/	/	A SS CC PT	CC 3'-7'
1.5	DK GRAY-BLACK	20	80	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	Y	SL HC	25	A SS CC PT	
3.0	BLUE GRAY	20	80	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	N	SL HC	4' 8	A SS CC PT	SAMPLE @ 4'
5 10	BLACK	30	70	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	MOST	SL HC		A SS CC PT	CC 7'-10'
6.5	OL TO GRAY	5	20	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	N	SL HC	12	A SS CC PT	SOME GRAVEL UP TO 2"
10.0	HALT		BLUE GRAY	N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (ft): ~6.5'
CASING TYPE/DIAMETER (in): 1.5" SCH 40 PVC
SCREEN INTERVAL (ft bgs): 5'-10' - 10-SLOT

PURGE VOLUME:
PURGE METHOD:

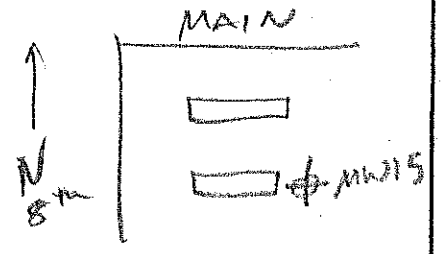
SAMPLING METHOD:
ANALYTES: 2/10 SAND 5-10
CLOSURE: BENT 1.6-5

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: HP/Fortuna
PROJECT NO.: 4563.01
DATE: 9/21/04
DRILLER: LAICES
PM: CJW
LOGGED BY: CJW

GLOBAL ID:
FIELD POINT NAME: 4563 - MW15
DRILLING METHOD: DIRECT PUSH
AUGER/ROD DIAMETER (in): 1.5/3.25"
LOCATION: E. OF S. PUMP ISLAND
ELEVATION (ft):



LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VD=VERY DENSE	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
0 0.4	CONC. BASE			N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	HAND AUGER TO 3'
0.6	GRAY	5	20	N L M H	S F ST H	25 F M C	50 F M C	/	L MD D VD	SW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	N	SL MO	/	A SS CC PT	CC 3'-7'
1.5 (SAME)	DK GRAY	15	85	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC MD CL OL MH CH OH Pt	D M W S	N	SL MO/HC	17	A SS CC PT	CC 7'-10'
2.0	SAME AS	0.6		N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	N	↓	/	A SS CC PT	SAMPLE @ 4'
2.75	BLUE GRAY	20	80	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	N	SL HC	19	A SS CC PT	PID 22 AT 4' WET AT 5'
5.5	BLACK	30	70	N L M H	S F ST H	F M C	F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	MOST	↓	7	A SS CC PT	
7.0	OL GRAY	5	20	N L M H	S F ST H	50 F M C	25 F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	N	ST HC	377	A SS CC PT	SAMPLE AT 8'
10.0	HALT			N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	↓	↓	361	A SS CC PT	→ PID AT 10' SOME GRAVEL 72"

DEPTH TO WATER (ft): ~ 7
CASING TYPE/DIAMETER (in): 1.5 SCH 40 PVC
SCREEN INTERVAL (ft bgs): 5-10, 10-SLOT

PURGE VOLUME:
PURGE METHOD:

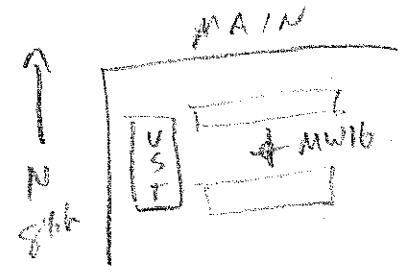
SAMPLING METHOD:
ANALYTES: 2/16 SAND 5-10
CLOSURE: 06 MT 1.5-5

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: HPI FORTUNA SHELL
PROJECT NO:. 4563.01
DATE: 9/21/04
DRILLER: LACES
PM: CJW
LOGGED BY: CJW

GLOBAL ID:
FIELD POINT NAME: 4563-MW16
DRILLING METHOD: DP
AUGER/ROD DIAMETER (in):
LOCATION:
ELEVATION (ft):



LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	%CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	%SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VD=VERY DENSE	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
0 0.5	Concrete A/cw	—	—	N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	HAND AUGER TO 3'
4.0	Basecrock Base	—	—	N L M H	S F ST H	50 F M C	50 F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	NO	HC	372	A SS CC PT	CC 3' to 7'
6.0	OL Gray Blue gray	5	20	N L M H	S F ST H	50 F M C	25 F M C	/	L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S	NO	ST HC	459	A SS CC PT	SAMPLE @ 4'
9.0	COLOR change	—	—	N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S			→	A SS CC PT	CC 7' to 10'
	SYB			N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S			8	A SS CC PT	AT 10'
HALT 10'				N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	SAMPLE @ 9'
				N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D VD	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (ft): ~7'
CASING TYPE/DIAMETER (in): 1.5" PVC SCH 40
SCREEN INTERVAL (ft bgs): 5-10' - 10-SLOT

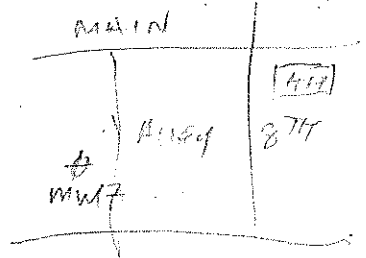
PURGE VOLUME:
PURGE METHOD: /

SAMPLING METHOD:
ANALYTES: 2/16 SAND 5-10
CLOSURE: BENT 1.5-5

LACO ASSOCIATES
CONSULTING ENGINEERS
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: HPI FORTUNA SHELL
PROJECT NO.: 4563
DATE: 11/1/04
DRILLER: DRL
PM: CJW
LOGGED BY: JMW

GLOBAL ID:
FIELD POINT NAME: MW17
DRILLING METHOD: GEOPROBE
AUGER/ROD DIAMETER (in): 3 1/4"
LOCATION:
ELEVATION (ft):



LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY ~~HARD~~ DENSE	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
0	LT. BRN.			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S				A SS CC PT	
6	TAN	5	10	N L M H	S F ST H	75 F M C	10 F M C	SR	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	W	—	A SS CC PT	
.4	"	5	10	N L M H	S F ST H	85 F M C	— F M C	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	W	—	A SS CC PT	
75	"	10	15	N L M H	S F ST H	75 F M C	— F M C	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	W	—	A SS CC PT	SOME MN STAIN
0.0	"	10	20	N L M H	S F ST H	70 F M C	— F M C	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	SL MTBE	—	A SS CC PT	MN STAIN
2.5	"	<5	15	N L M H	S F ST H	85 F M C	— F M C	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	SL MTBE	—	A SS CC PT	MN STAIN
24.3	"	5	10	N L M H	S F ST H	85 F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	"	—	A SS CC PT	
24.9	"	—	10	N L M H	S F ST H	90 F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PI	D M W S	—	"	—	A SS CC PT	

DEPTH TO WATER (ft): MOIST @ 12
CASING TYPE/DIAMETER (in): 1.5"
SCREEN INTERVAL (ft bgs): 22.5 - 24.5 & 26-28

PURGE VOLUME:
PURGE METHOD: DHP

SAMPLING METHOD:
ANALYTES:
CLOSURE:

20-SC 20ST 75F

CONSULTING ENGINEERS
TEL 707.443.5054
FAX 707.443.0553

22.5 24.5
26 - 28

PROJECT NAME: HPI - FORTUNA SHELL
PROJECT NO.: 4563
DATE: 11/1/04
DRILLER: DRL
PM: CJW
LOGGED BY: JMW

GLOBAL ID:
FIELD POINT NAME: MW17
DRILLING METHOD:
AUGER/ROD DIAMETER (in):
LOCATION:
ELEVATION (ft):

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
5.2	TAN W/RED	5	15	N L M H	S F ST H	F M C 80	—	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	SL MTBE	—	A SS CC PT	Fe Stain
5.4	LT. ~~BROWN~~			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	—	—	A SS CC PT	
6.3	LT. TAN	—	5	N L M H	S F ST H	F M C 95	—	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	MTBE	—	A SS CC PT	SOME FE STAIN
6.7	TAN			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	—	—	A SS CC PT	~~Some Fe STAIN~~
7.8	TAN	<5	15	N L M H	S F ST H	F M C 70	F M C 15	SR TO R	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	MTBE	—	A SS CC PT	Fe Stain
8	TAN	5	20	N L M H	S F ST H	F M C 75	—	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	N	—	A SS CC PT	
9.9	LT. GRAY TAN	—	5	N L M H	S F ST H	F M C 95	—	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	N	—	A SS CC PT	
31.1	"	10	15	N L M H	S F ST H	F M C 75	—	—	L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH PT	D M W S	—	N	—	A SS CC PT	LARGE Mn @ 32'

DEPTH TO WATER (ft):
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD:
ANALYTES:
CLOSURE:

HALT @ 32' BGS IN SAME.

M -17D

Well No. **MW-17D**

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: ALLEY WEST OF 8TH STREET
DATE: 11/1/04
DRILLING METHOD: GEOPROBE
ELEVATION: 55 Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: JMW
DEPTH TO WATER: INITIAL ▽ : NA **COMPLETION** ▼ : NA
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 26 - 28'
SEAL AND INTERVAL: GROUT 1.5 - 25.5'
SAND PACK AND INTERVAL: 25.5 - 28' #2/16

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
55 — 0			NO RECOVERY FROM 0 TO 16 FEET BGS.			
52.5 — 2.5						
50 — 5						
47.5 — 7.5						
45 — 10						
42.5 — 12.5						
40 — 15						
		SM	SILTY SAND: tan, medium dense, moist; 5% clay, 10% silt,			
		SM	medium plasticity, 75% fine to medium sand, 10% fine to medium subrounded gravel. No hydrocarbon odor or staining.			
37.5 — 17.5			SILTY SAND: tan, medium dense, moist; 5% clay, 10% silt, low			

Figure _____

M 17D

Well No. MW-17D

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: ALLEY WEST OF 8TH STREET
DATE: 11/1/04
DRILLING METHOD: GEOPROBE
ELEVATION: 55 Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: JMW
DEPTH TO WATER: INITIAL ▽ : NA **COMPLETION** ▼ : NA
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 26 - 28'
SEAL AND INTERVAL: GROUT 1.5 - 25.5'
SAND PACK AND INTERVAL: 25.5 - 28' #2/16

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
			plasticity, 85% fine sand. No hydrocarbon odor or staining. SILTY SAND: tan, dense, moist; 10% clay, 15% silt, medium plasticity, 75% fine to medium sand. No hydrocarbon odor or staining. Some manganese stain.			
35 — 20			SILTY SAND: tan, medium dense, moist; 10% clay, 20% silt, 75% fine to medium sand. Slight MTBE odor. Manganese stain.			
32.5 — 22.5			SILTY SAND: tan, medium dense, moist; less than 5% clay, 15% silt, 85% fine sand. Slight MTBE odor. Manganese stain.			
30 — 25		SP-SM	SILTY SAND: tan, medium dense, moist; 5% clay, 10% silt, 85% fine sand. Slight MTBE odor.			
		SM	POORLY GRADED SAND WITH SILT; tan, loose, wet; 10% silt, low plasticity, 90% fine sand. Slight MTBE odor.			
		SP	SILTY SAND; tan with red, medium dense, moist; 5% clay, 15% silt, low plasticity, 80% fine sand. Slight MTBE odor. Iron stain. POORLY GRADED SAND; light tan, medium dense, moist to wet; 5% silt, 95% fine sand. MTBE odor. Iron stain.			
27.5 — 27.5		SM	SILTY SAND WITH GRAVEL; tan, loose, wet; less than 5% clay, 15% silt, no plasticity, 70% fine to medium sand, 10% fine subrounded to rounded gravel. MTBE odor. Iron stain.			
		SM	SILTY SAND; tan, medium dense, moist; 5% clay, 20% silt, low plasticity, 75% fine sand. No hydrocarbon odor or staining.			
25 — 30						
		SP	POORLY GRADED SAND; light gray tan, loose, moist; 5% silt, 95% fine sand. No hydrocarbon odor or staining.			
		SM	SILTY SAND; light gray tan, medium dense, moist; 10% clay, 15% silt, low plasticity, 75% fine sand. No hydrocarbon odor or staining. Large manganese nodules at 32 feet bgs. HALT AT 32 FEET BGS IN SAME.			
22.5 — 32.5						
20 — 35						

Figure _____

M 17S

Well No. MW-17S

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: ALLEY WEST OF 8TH STREET
DATE: 11/1/04
DRILLING METHOD: GEOPROBE
ELEVATION: 55 Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: JMW
DEPTH TO WATER: INITIAL ▽: NA **COMPLETION** ▼: NA
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 22.5 - 24.5'
SEAL AND INTERVAL: GROUT 1.5 - 22'
SAND PACK AND INTERVAL: 22 - 24.5' #2/16

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
55 — 0			NO RECOVERY FROM 0 TO 16 FEET BGS.			
52.5 — 2.5						
50 — 5						
47.5 — 7.5						
45 — 10						
42.5 — 12.5						
40 — 15						
		SM	SILTY SAND: tan, medium dense, moist; 5% clay, 10% silt,			
		SM	medium plasticity, 75% fine to medium sand, 10% fine to medium subrounded gravel. No hydrocarbon odor or staining.			
37.5 — 17.5			SILTY SAND: tan, medium dense, moist; 5% clay, 10% silt, low			

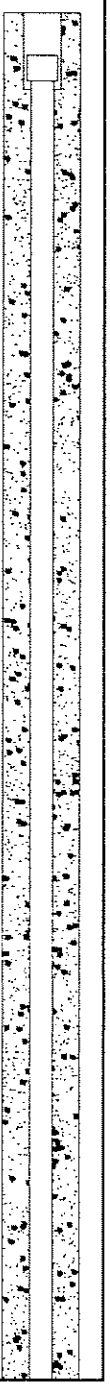


Figure _____

Well No. MW-17S

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: ALLEY WEST OF 8TH STREET
DATE: 11/1/04
DRILLING METHOD: GEOPROBE
ELEVATION: 55 Feet msl
DRILLER: LAKE'S WELL DRILLING
LOGGED BY: JMW
DEPTH TO WATER: INITIAL ▽ : NA **COMPLETION** ▼ : NA
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS
WELL CASING: 1.5" PVC
WELL SCREEN AND INTERVAL: 10-slot, 22.5 - 24.5'
SEAL AND INTERVAL: GROUT 1.5 - 22'
SAND PACK AND INTERVAL: 22 - 24.5' #2/16

ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D ppm	Hanby Result	Well Construction Diagram
			plasticity, 85% fine sand. No hydrocarbon odor or staining. SILTY SAND: tan, dense, moist; 10% clay, 15% silt, medium plasticity, 75% fine to medium sand. No hydrocarbon odor or staining. Some manganese stain.			
35 — 20			SILTY SAND: tan, medium dense, moist; 10% clay, 20% silt, 75% fine to medium sand. Slight MTBE odor. Manganese stain.			
32.5 — 22.5			SILTY SAND: tan, medium dense, moist; less than 5% clay, 15% silt, 85% fine sand. Slight MTBE odor. Manganese stain.			
30 — 25			SILTY SAND: tan, medium dense, moist; 5% clay, 10% silt, 85% fine sand. Slight MTBE odor. HALT AT 24.5 FEET BGS IN SAME.			
27.5 — 27.5						
25 — 30						
22.5 — 32.5						
20 — 35						

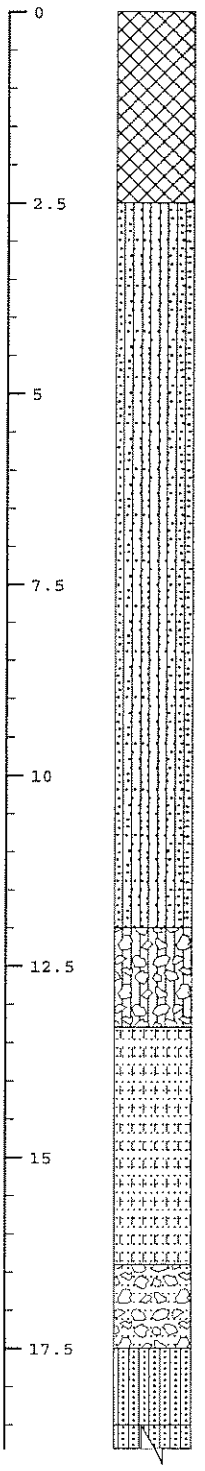
Figure _____

Attachment 2

ENVIRONMENTAL BORING LOG

Boring No. B12

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: ALLEY WEST OF 8TH STREET
DATE: 9/30/2004
DRILLING METHOD: GEOPROBE
ELEVATION:
DRILLER: LAKE'S
LOGGED BY: JMW
DEPTH TO WATER: INITIAL ▽ : **COMPLETION** ▼ :
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS



ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
		FILL	ROAD BASE; light brown, medium dense, dry to moist; 15% silt, no plasticity, 60% well graded sand, 25% well graded gravel. No hydrocarbon odor or staining.		
		SM-ML	SILT WITH SAND; light gray brown, soft to firm, moist; 10% clay, 50% silt, medium plasticity, 40% fine sand. No hydrocarbon odor or staining.		
		ML	SILT WITH GRAVEL; dark brown, firm, wet; 25% clay, 60% silt, medium plasticity, 15% fine to medium subrounded to rounded gravel. No hydrocarbon odor or staining.		
		SW-SM	WELL GRADED SAND WITH SILT AND GRAVEL; tan with gray, medium dense, moist; 5% clay, 20% silt, no plasticity, 50% well graded sand, 25% fine subrounded to rounded gravel. No hydrocarbon odor or staining. Managanese nodules present.		
		SW	WELL GRADED SAND WITH GRAVEL; light to dark brown, medium dense, moist; 15% silt, no plasticity, 60% well graded sand, 25% well graded subrounded to rounded gravel. No hydrocarbon odor or staining.		
		SM	SILTY SAND; tan, medium dense, moist; 20% silt, no plasticity, 80% fine sand. No hydrocarbon odor or staining.		

Figure _____

ENVIRONMENTAL BORING LOG

Boring No. B12

PROJECT: HPI Fortuna Shell
PROJECT NO.: 4563.01
BORING LOCATION: ALLEY WEST OF 8TH STREET
DATE: 9/30/2004
DRILLING METHOD: GEOPROBE
ELEVATION:
DRILLER: LAKE'S
LOGGED BY: JMW
DEPTH TO WATER: INITIAL ▽ : **COMPLETION** ▼ :
SITE GEOLOGY: FLUVIAL TERRACE AND COLLUVIAL FAN DEPOSITS

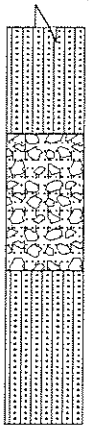
ELEVATION/ DEPTH	SOIL SYMBOLS, SAMPLERS AND TEST DATA	USCS	Description	P.I.D. ppm	Hanby result
20		SM	SILTY SAND; tan with red, medium dense, moist; 5% clay, 25% silt, low to medium plasticity, 70% fine to medium sand. No hydrocarbon odor or staining, iron staining present.		
		SW-SM	WELL GRADED SAND WITH SILT AND GRAVEL; tan with red, medium dense, moist to wet; 5% clay, 15% silt, low plasticity, 60% well graded sand, 20% fine to medium subrounded to rounded gravel. No hydrocarbon odor or staining.		
22.5		SM	SILTY SAND; tan, medium dense, moist; 5% clay, 25% silt, 70% fine sand. No hydrocarbon odor or staining.		
			SILTY SAND; red brown, medium dense, moist to wet; 5% clay, 15% silt, low plasticity, 70% fine to medium sand, 10% fine to medium gravel. No hydrocarbon odor or staining. HALT AT 24 FEET BGS IN SAME.		
25					
27.5					
30					
32.5					
35					
37.5					

Figure _____

HAGER-RICHARDS
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME:
PROJECT NO.: 4563.01
DATE:
DRILLER:
PM:
LOGGED BY:

GLOBAL ID:
FIELD POINT NAME: XX-2 4563-B12
DRILLING METHOD:
AUGER/ROD DIAMETER (in):
LOCATION:
ELEVATION (ft):

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
22.0	TAN	5	25	N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S	—	N	—	A SS / CC PT	Fe + mn
5.0	Red Brn.	5	15	N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S	—	N	—	A SS / CC PT	HALT @ 24.0 IN SAMPLE
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	

DEPTH TO WATER (ft):
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD:
ANALYTES:
CLOSURE:

Attachment 3

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11-10-04
Golbal ID No.: T0602300471
PM: CJW

Tech: SJD
Mob/Demob time: .75/.25
Travel time: 1.0
Time on site: 9:30
Time off site: 5:05
Mileage: 35

WELL No.:	MW11		MW10		MW9		MW3		MW6	
DIAMETER (in)	2.00		2.00		2.00		2.00		2.00	
SCREENED INTERVAL (ft)	12.5-15.5		12.5-15.5		12-15		5-12		12-20	
DEPTH TO WATER (ft)	9.62		12.61		9.07		5.94		8.42	
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH	6.70	6.48	6.57	6.40	7.32	7.34	6.73	6.67	7.86	7.25
TEMP (°C)	17.3	18.5	16.8	18.2	16.9	18.8	16.8	18.9	16.6	18.2
Ecw (µmohs)	346	283	238	224	234	233	303	283	183	178
ORP (mV)	Ur	Ur	-81	-82	Ur	Ur	-97	Ur	-10	61
DO (mg/L)	1.51	0.71	1.92	0.90	1.67	0.47	1.61	0.51	27.48	30.41
OTHER (units)	—		—		—		—		—	
PURGE: TIME	10:54	11:02	11:49	11:55	12:16	12:24	12:43	12:51	1:12	1:27
METHOD (DHP/CB/B)	DHP		DHP		DHP		DHP		DHP	
RATE (Lpm)	0.18		0.20		0.18		0.19		0.18	
VOLUME (L)	1.40		1.20		1.40		1.50		1.80	
COLOR	CLOUDY	CLEAR	CLOUDY	CLOUDY	CLEAR	CLEAR	CLEAR	CLEAR	CLOUDY	LT. BROWN CLOUDY
ODOR	STRONG SULFUR		LT. SULFUR / SWEET		MED. SULFUR		LT. FUEL / SLIGHT ORGANIC		NONE	
INTAKE DEPTH (FEET)	13.0		15.0		13.5		10.0		16.0	
SAMPLE: TIME	11:03		11:56		12:25		12:52		1:23	
METHOD (DHP/CB/B)	DHP		DHP		DHP		DHP		DHP	
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC	
TOTAL DRAWDOWN (FEET)	1.70		0.87		1.64		0.57		2.56	
REMARKS	—		—		—		—		—	
WELL CONDITION	good		good		good		good		good	

DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING

WASTE DRUMS: 4 DOT DRUMS ONSITE 2 SOIL 1 FULL 1 - 1/4 FULL 2 DECON & PURGE H2O

DHP=DOWN HOLE PUMP CB=CHECK BALL B=BAILER FD=FIELD DUPLICATE MB=METHOD BLANK FF=FIELD FILTERED 1 FULL 1 - 1/2 FULL

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11-10-04
Golbal ID No.: T0602300471
PM: CJW

Tech: SJD
Mob/Demob time: .75/.25
Travel time: 1.0
Time on site: 9:30
Time off site: 5:05
Mileage: 35

WELL No.:	MW12		MW7		MW13		MW1		MW4	
DIAMETER (in)	2.00		2.00		2.00		2.00		2.00	
SCREENED INTERVAL (ft)	12.5-15		10 - 15		12.5-15		6-10		5-10	
DEPTH TO WATER (ft)	9.31		6.13		—		—		5.80	
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH	6.33	6.21	6.58	6.42					6.74	6.60
TEMP (°C)	16.8	18.7	17.1	19.0					17.5	19.2
Ecw (µmohs)	306	275	235	223					227	218
ORP (mV)	-61	-51	77	96					22	66
DO (mg/L)	1.86	0.68	12.83	14.12					13.29	22.32
OTHER (units)	—		—						—	
PURGE: TIME	11:20	11:30	1:51	2:01					2:23	2:35
METHOD (DHP/CB/B)	DHP		DHP						DHP	
RATE (Lpm)	0.15		0.18						0.17	
VOLUME (L)	1.50		1.80						2.0	
COLOR	CLEAR	CLEAR	CLEAR	CLOUDY					CLEAR	CLEAR
ODOR	LT. SULFUR / SWEET		SLIGHT ORGANIC						LT. FUEL / SULFUR	
INTAKE DEPTH (FEET)	13.0		12.5						8.5	
SAMPLE: TIME	11:31		2:02		—		—		2:36	
METHOD (DHP/CB/B)	DHP		DHP		—		—		DHP	
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC	
TOTAL DRAWDOWN (FEET)	1.01		1.20		—		—		0.85	
REMARKS	—		—		—		—		—	
WELL CONDITION	good		2 BOLT HOLES STRIPPED		—		—		good	
WASTE DRUMS										

DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING

DHP=DOWN HOLE PUMP CB=CHECK BALL B=BAILER FD=FIELD DUPLICATE MB=METHOD BLANK FF=FIELD FILTERED

LACO ASSOCIATES
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Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11-10-04
Golbal ID No.: T0602300471
PM: CJW

Tech: SJD
Mob/Demob time: .75 / .25
Travel time: 1.0
Time on site: 9:30
Time off site: 5:05
Mileage: 35

WELL No.:	MW14		MW15		MW16		MW17S		MW17D	
DIAMETER (in)	1.50		1.50		1.50		1.50		1.50	
SCREENED INTERVAL (ft)	5-10		5-10		5-10		22.5-24.5		26-28	
DEPTH TO WATER (ft)	7.15		6.43		5.79		—		—	
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH	6.74	6.68	6.59	—	6.51	6.50				
TEMP (°C)	18.0	18.3↑	16.7	—	16.3	17.7				
Ecw (µmohs)	318	327	334	—	341	327				
ORP (mV)	-89	-90↓	-68	—	-57	-60				
DO (mg/L)	1.75	0.70↓	1.68	—	1.13	0.80				
OTHER (units)	—		—		—					
PURGE: TIME	3:04	3:08	3:33	—	4:04	4:10				
METHOD (DHP/CB/B)	DHP		DHP		DHP					
RATE (Lpm)	0.13		0.13		0.18					
VOLUME (L)	.50		.25		1.10					
COLOR	CLOUDY	CLOUDY	CLEAR	CLEAR	CLOUDY	CLOUDY				
ODOR	MED. SULFUR		MED. SULFUR		LT FUEL / SLIGHT SWEET					
INTAKE DEPTH (FEET)	9.0		9.0		9.0					
SAMPLE: TIME	3:09		3:36		4:11		—		—	
METHOD (DHP/CB/B)	DHP		DHP		DHP		—		—	
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC	
TOTAL DRAWDOWN (FEET)	2.20		2.82		2.91		—		—	
REMARKS	WELL NOT RECHARGING FAST ENOUGH TO COMPLETE FI -		WELL NOT RE-CHARGING - COULD NOT FINISH FI		—		—		—	
WELL CONDITION	good	LOWERED DHP TO 9.5' TO COLLECT SAMPLE	good	LOWERED DHP TO 9.5' TO COLLECT SAMPLE	good		—		—	
WASTE DRUMS										

DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING

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Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11-10-04
Golbal ID No.: T0602300471
PM: CJW

Tech: SJD
Mob/Demob time: .75/.25
Travel time: 1.0
Time on site: 9:30
Time off site: 5:05
Mileage: 35

WELL No.:	MW2		MW8		MW5					
DIAMETER (in)	2.00		2.00		2.00					
SCREENED INTERVAL (ft)	5-10		15-20		5-10					
DEPTH TO WATER (ft)	—		10.32		—					
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH			6.58	6.46						
TEMP (°C)			15.8	17.4						
Ecw (µmohs)			288	272						
ORP (mV)			-71	-81						
DO (mg/L)			1.86	0.73						
OTHER (units)			—							
PURGE: TIME			4:28	4:38						
METHOD (DHP/CB/B)			DHP							
RATE (Lpm)			0.15							
VOLUME (L)			1.50							
COLOR			CLEAR	CLEAR						
ODOR			MED. SULFUR / SWEET							
INTAKE DEPTH (FEET)			17.5							
SAMPLE: TIME	—		4:39		—					
METHOD (DHP/CB/B)	—		DHP		—					
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC					
TOTAL DRAWDOWN (FEET)	—		1.99		—					
REMARKS	—		—		—					
WELL CONDITION	—		good		—					
WASTE DRUMS										

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FAX 707.443.0553

Project Name: FORTUNA SHELL - HPI

Project No.: 4563.01

Tech: SJD

Date: 11-10-04

WELL ID:	METER ACCURACY RANGE				
MW11	+/- 0.2 pH	+/- 0.5 °C	+/- 20 µmohs	+/- 2 mv	+/- 0.3 mg/L

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
~~10:56~~	~~6.57~~	~~17.8~~	~~321~~	~~Ur~~	~~1.43~~
10:58	6.55	17.9	305	Ur	0.90
11:00	6.51	18.2	293	Ur	0.80
11:02	6.48	18.5	283	Ur	0.71

WELL ID: MW12

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
~~11:22~~	~~6.26~~	~~17.5~~	~~293~~	~~-63~~	~~1.56~~
11:24	6.24	18.0	285	-63	1.08
11:26	6.23	18.5	282	-62	0.82
11:28	6.22	18.6	279	-52	0.72
11:30	6.21	18.7	275	-51	0.68

WELL ID: MW10

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
11:51	6.47	17.4	234	-78	1.32
11:53	6.42	18.0	230	-81	0.93
11:55	6.40	18.2	224	-82	0.90

WELL ID: MW9

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
12:18	7.31	17.8	239	Ur	1.10
12:20	7.34	18.3	239	Ur	0.74
12:22	7.33	18.6	236	Ur	0.55
12:24	7.34	18.8	233	Ur	0.47

WELL ID: MW3

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
12:45	6.71	17.7	295	Ur	1.10
12:47	6.68	18.4	289	Ur	0.65
12:49	6.67	18.7	285	Ur	0.58
12:51	6.67	18.9	283	Ur	0.51

WELL ID: MW6

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
1:14	7.39	17.3	179	30	29.70
1:16	7.25	17.9	177	45	30.18
1:18	7.25	18.1	177	52	30.14
1:20	7.26	18.2	177	60	30.45
1:22	7.25	18.2	178	61	30.41

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Project Name: FORTUNA SHELL - HPI
Project No.: 4563.01
Tech: SJD
Date: 11-10-04

WELL ID:	METER ACCURACY RANGE				
MW7	+/- 0.2 pH	+/- 0.5 °C	+/- 20 µmohs	+/- 2 mv	+/- 0.3 mg/L

WELL ID: MW7					
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
~~1:25~~	~~6.63~~	~~18.0~~	~~226~~	~~18~~	~~12.26~~
1:53	6.48	18.1	230	79	12.81
1:55	6.45	18.6	228	82	13.79
1:57	6.43	18.9	225	90	13.67
1:59	6.43	19.0	223	95	14.19
2:01	6.42	19.0	223	96	14.12

WELL ID: MW4					
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
2:27	6.59	18.6	223	24	19.91
2:29	6.62	18.9	220	49	21.77
2:31	6.62	19.1	217	62	22.40
2:33	6.61	19.2	218	64	22.46
2:35	6.60	19.2	218	66	22.32

WELL ID: MW14					
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
3:06	6.72	18.1	326	-96	1.20
3:08	6.68	18.3	327	-90	0.70
3:10	WELL NOT RECHARGING				

WELL ID: MW15					
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
3:35	6.60	17.3	328	-73	1.10
WELL NOT RECHARGING					
	PULLED SAMPLE				

WELL ID: MW16					
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
4:06	6.49	17.1	337	-59	1.34
4:08	6.50	17.5	336	-59	0.85
4:10	6.50	17.7	327	-60	0.80

WELL ID: MW8					
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
4:30	6.50	16.7	282	-72	1.16
4:32	6.46	17.0	280	-76	0.87
4:34	6.46	17.2	276	-78	0.77
4:36	6.47	17.3	275	-80	0.82
4:38	6.46	17.4	272	-81	0.73

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Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11/10/04
Golbal ID No.: T0602300471
PM: CJW

Tech: ~~SJD~~ JLS
Mob/Demob time: .25/.25
Travel time: 1.0
Time on site: 12:00 pm
Time off site: 4:45
Mileage: 35

WELL No.:	MW11		MW10		MW9		MW3		MW6	
DIAMETER (in)	2.00		2.00		2.00		2.00		2.00	
SCREENED INTERVAL (ft)	12.5-15.5		12.5-15.5		12-15		5-12		12-20	
DEPTH TO WATER (ft)										
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH										
TEMP (°C)										
Ecw (µmohs)										
ORP (mV)										
DO (mg/L)										
OTHER (units)										
PURGE: TIME										
METHOD (DHP/CB/B)										
RATE (Lpm)										
VOLUME (L)										
COLOR										
ODOR										
INTAKE DEPTH (FEET)										
SAMPLE: TIME										
METHOD (DHP/CB/B)										
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC	
TOTAL DRAWDOWN (FEET)										
REMARKS										
WELL CONDITION										
WASTE DRUMS										

DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING

DHP=DOWN HOLE PUMP CB=CHECK BALL B=BAILER FD=FIELD DUPLICATE MB=METHOD BLANK FF=FIELD FILTERED

4 Drums
1/4 soil
1/4 water

REVISED:11/10/04

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Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11/10/04
Golbal ID No.: T0602300471
PM: CJW

Tech: ~~SJD~~ JLS
Mob/Demob time: .25/.25
Travel time: 1.0
Time on site: 12:00 pm
Time off site: 4:[illegible]
Mileage: 75

WELL No.:	MW12		MW7		MW13		MW1		MW4	
DIAMETER (in)	2.00		2.00		2.00		2.00		2.00	
SCREENED INTERVAL (ft)	12.5-15		10 - 15		12.5-15		6-10		5-10	
DEPTH TO WATER (ft)					8.34'		5.42'		—	
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH						7		6		
FIELD INTRINSICS: TEMP (°C)					18.3	18.5	18.9	19.7		
FIELD INTRINSICS: Ecw (µmohs)					449	496	218	243		
FIELD INTRINSICS: ORP (mV)					Ur	Ur	40	95		
FIELD INTRINSICS: DO (mg/L)					1.24	0.75	15.29	12.11		
FIELD INTRINSICS: OTHER (units)					—		—			
PURGE: TIME					2:14	2:24	2:45	3:05		
PURGE: METHOD (DHP/CB/B)					DHP		DHP			
PURGE: RATE (Lpm)					0.15		0.325			
PURGE: VOLUME (L)					1.5		4.5			
PURGE: COLOR					Clear	Clear	Clear	Clear		
PURGE: ODOR					Mild		Mild			
PURGE: INTAKE DEPTH (FEET)					13.50'		8.00'			
SAMPLE: TIME					2:37		3:08			
SAMPLE: METHOD (DHP/CB/B)					DHP		DHP			
SAMPLE: ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC	
SAMPLE: TOTAL DRAWDOWN (FEET)					2.69'		0.91'			
SAMPLE: REMARKS					—		—			
WELL CONDITION					Good		Good			
WASTE DRUMS										

DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING

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Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11/10/04
Golbal ID No.: T0602300471
PM: CJW

Tech: ~~SJD~~ JLS
Mob/Demob time: 1.25 / 1.25
Travel time: 1.0
Time on site: 12:00 PM
Time off site: 4:45
Mileage: 75

WELL No.:	MW14		MW15		MW16		MW17S		MW17D	
DIAMETER (in)	1.50		1.50		1.50		1.50		1.50	
SCREENED INTERVAL (ft)	5-10		5-10		5-10		22.5-24.5		26-28	
DEPTH TO WATER (ft)	—		—		—		21.26'		24.53	
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
FIELD INTRINSICS: pH										
TEMP (°C)										
Ecw (µmohs)										
ORP (mV)										
DO (mg/L)										
OTHER (units)										
PURGE: TIME										
METHOD (DHP/CB/B)										
RATE (Lpm)										
VOLUME (L)										
COLOR										
ODOR										
INTAKE DEPTH (FEET)							—		—	
SAMPLE: TIME							11:20		12:45	
METHOD (DHP/CB/B)							3/4" B		3/4" B	
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC	
TOTAL DRAWDOWN (FEET)							—		—	
REMARKS							not making water		not making water	
WELL CONDITION							good		good	
WASTE DRUMS										

DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING

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Project Name: Fortuna Shell - HPI
Project No.: 4563.01
Date: 11/12/04
Golbal ID No.: T0602300471
PM: CJW

Tech: ~~SJD~~ JLS
Mob/Demob time: [illegible]
Travel time: 1.0
Time on site: 12:00 PM
Time off site: 4:35
Mileage: 35

WELL No.:	MW2		MW8		MW5					
DIAMETER (in)	2.00		2.00		2.00					
SCREENED INTERVAL (ft)	5-10		15-20		5-10					
DEPTH TO WATER (ft)	5.31'				5.25					
	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL	INITIAL	FINAL
DEPTH MEASUREMENTS ARE REFERENCED TO TOP OF CASING — FIELD INTRINSICS: pH		7								
TEMP (°C)	18.5	19.1								
Ecw (µmohs)	425	397								
ORP (mV)	Ur	Ur								
DO (mg/L)	93	0.46								
OTHER (units)	—									
PURGE: TIME	3:28	3:34								
METHOD (DHP/CB/B)	DHP									
RATE (Lpm)	.25									
VOLUME (L)	1.5									
COLOR	Clear	Clear								
ODOR	0:1									
INTAKE DEPTH (FEET)	7.50'				—					
SAMPLE: TIME	3:37				3:55					
METHOD (DHP/CB/B)	DHP				1½" B					
ANALYTES	8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC		8260 List 5; TPHd/mo w/SGC					
TOTAL DRAWDOWN (FEET)	0.91'									
REMARKS					[illegible]					
WELL CONDITION	Good				Good					
WASTE DRUMS										

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Project Name: Fortuna Shell (HRI)
Project No.: 45563.01
Tech: JLS
Date: 11/10/04

WELL ID: METER ACCURACY RANGE

	+/- 0.2 pH	+/- 0.5 °C	+/- 20 µmohs	+/- 2 mv	+/- 0.3 mg/L
TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)

WELL ID:

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)

WELL ID: MW1

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
2:47		19.2	221	37	14.90
2:49		19.6	215	52	16.00
2:51		19.6	215	65	15.79
2:53		19.6	216	74	15.77
2:55		19.7	219	80	15.04
2:57		19.8	219	87	14.70
2:59		19.7	234	93	14.13
3:01		19.5	237	97	13.21
3:03		19.8	245	90	11.57
3:05	6	19.7	243	95	12.11

WELL ID: MW2

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
3:30		18.6	411	Ur	1.11
3:32		19.0	404	Ur	0.89
3:34	7	19.1	397	Ur	0.76

WELL ID: MW17S

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
12:30		15.6	716	Ur	6.05
12:32					
	Not enough water to complete				

WELL ID: MW13

TIME	pH	TEMP (°C)	Ecw (µmohs)	ORP (mV)	DO (mg/L)
2:16		17.9	510	Ur	1.89
2:18		17.7	496	Ur	1.37
2:20		18.1	509	Ur	1.05
2:22		19.0	486	Ur	0.74
2:24	7	18.5	486	Ur	0.75

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Project Name: FORTUNA SHELL - HPI
Project No.: 4563.01
Tech: SJD / JLS
Date: 11-10-04

WELL ID: mw1		WELL ID: mw2		WELL ID: mw3		WELL ID: mw4		WELL ID: mw5		WELL ID: mw6	
TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)
:35	5.40	3:20	5.31	12:30	5.94	2:10	5.89	3:50	5.33	1:09	8.43
				12:40	5.94	2:20	5.89				

WELL ID: mw7		WELL ID: mw8		WELL ID: mw9		WELL ID: mw10		WELL ID: mw11		WELL ID: mw12	
TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)
38	6.13	4:24	10.37	12:13	9.07	10:33	12.64	10:31	9.59	10:29	9.43
:49	6.13					10:43	12.61	10:45	9.63	11:10	9.31
						11:45	12.61	10:52	9.63	11:18	9.31

WELL ID: mw13		WELL ID: mw14		WELL ID: mw15		WELL ID: mw16		WELL ID: mw17S		WELL ID: mw17D	
TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)	TIME	DTW (ft)
:10	8.34	10:22	7.21	10:24	6.44	10:26	5.79	1:10	21.26	12:25	24.53
		3:00	7.15	3:30	6.43	4:00	5.79				

REVISED:8/16/04

Attachment 4

Field Notes from monitoring well installation: 9/21/2004
Fortuna Gas For Less, LACO No. 4563.01/201

9/21/2004 - Arrived at LACO at 730 for 815 departure for site. JLS mobilize for site. CJW pick-up concrete saw at Don's Rent-all.

900 Arrive on-site. Notify management of day's planned activities and anticipated length of stay on-site. Check utility clearances and discuss first well location. Weather is clear.

915 Saw cut well box holes for MW14, MW15, and MW16.

945 Set up on MW14. Use probe to jack hammer out concrete. JLS clears hole for utilities with hand auger to 3.0 feet bgs. Continuous core 3 to 10 feet bgs with Macrocore. Drive 3.25-inch (OD) rods with expendable point to 10 feet. Set pipe and well materials.

1045 Set up on MW15. Use probe to jack hammer out concrete. JLS clears hole for utilities with hand auger to 3.0 feet bgs. Continuous core 3 to 10 feet bgs with Macrocore. Drive 3.25-inch (OD) rods with expendable point to 10 feet. Set pipe and well materials.

1145 Lunch.

1245 Set up on MW16. Use probe to jack hammer out concrete. JLS clears hole for utilities with hand auger to 3.0 feet bgs. Continuous core 3 to 10 feet bgs with Macrocore. Drive 3.25-inch (OD) rods with expendable point to 10 feet. Set pipe and well materials.

1345 Set well boxes x3.

1430 Clean up and leave.

Site inventory:
1 waste water drum
1 soil drums

Summary of work: HPI- Fortuna Shell
Monday November 1, 2004

0830 Depart LACO with JLS, DRL and JMW. Pick up supplies at Hensell's.
0900 Arrive on site, wait for delivery truck to move, set up on MW17D, next to boring B13 in alley west of site and 8th Street. Day's plan is to continuous core (CC) from 16 – 28 feet bgs, evaluate stratigraphy and determine if there is a deep water bearing unit not previously identified in this location, and contact CJW for well construction detail. Check USA marks, all clear. Hand auger (HA) to 4 feet bgs.
0940 Pulling CC from 16-20 feet bgs. CJW called to see if we need anything, will bring extra down hole pump (DHP).
1000 CC to 28' bgs, log cores, and collect soil samples at 20.5, 24.6, 27.5, 28.5' bgs.
1045 CJW onsite, instructs drill crew to CC to 32' bgs after encountering a silty gravel at approximately 27.8' bgs. CJW requests 2 wells, a shallow well screened from 22.5 to 24.5' bgs, and a deep well screened from 26 to 28' bgs.
1100 construct MW17D, 1.5" diameter SCH 40 PVC casing, screened interval (SI) from 26-28' bgs, 2/16 sand from 28 to 25.5' bgs, blank pipe from 26' bgs to grade, 8" Christy box w/ concrete apron, locking cap. CJW offsite. Add water and begin to develop MW17D.
1200 Clean up and break for lunch.
1300 Pump development water from well, well not making water. Decon and prepare cement slurry.
1415 HA to 4' bgs, install MW17S to 24.5' bgs.
1510 MW17S construction as follows: 1.5" diam. SCH40 PVC, SI from 22.5 to 24.5 feet bgs, 2/16 sand pack from 24.5 to 22' bgs, 8" Christy box, locking cap, and cement slurry to grade, concrete apron. Refill Geoprobe water tank.
1615 Clean up, need to haul drum to station and finish development of wells.
1620 Offsite.
1640 Arrive at LACO, demobe. End of day.

John Wellik
11/1/2004

Attachment 5

NORTH COAST LABORATORIES LTD.

October 05, 2004

LACO Associates
P.O. Box 1023
Eureka, CA 95502

Attn: Accounts Payable

RE: 4563.01, Fortuna Shell

Order No.: 0409610
Invoice No.: 45295
PO No.: TASK 202
ELAP No. 1247-Expires July 2006

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	4563-MW14-S4
02A	4563-MW14-S10
03A	4563-MW15-S4
04A	4563-MW15-S8
05A	4563-MW16-S4
06A	4563-MW16-S9

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

RECEIVED
LACO ASSOCIATES
OCT 0 8 2004
BY:

FRB
CJW
LDB

REPORT CERTIFIED BY

Laboratory Supervisor(s) | QA Unit | Jesse G. Chaney, Jr. Laboratory Director

5680 West End Road • Arcata California 95521-9202 • 707-822-4649 • FAX 707-822-6831

Printed on Recycled Paper

CLIENT: LACO Associates
Project: 4563.01, Fortuna Shell
Lab Order: 0409610

CASE NARRATIVE

Gasoline Components/Additives:
Samples 4563-MW14-S4, 4563-MW15-S4, 4563-MW15-S8, 4563-MW16-S4 and 4563-MW16-S9 do not present a peak pattern consistent with that of gasoline. The reported results represent the amount of material in the gasoline range.

Sample 4563-MW16-S4 was reported as ND with a dilution due to matrix interference.

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Date: 05-Oct-04
WorkOrder: 0409610

ANALYTICAL REPORT

Client Sample ID: 4563-MW14-S4 **Received:** 9/23/04 **Collected:** 9/21/04 0:00
Lab ID: 0409610-01A **Matrix:** Soil

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	0.025	µg/g	1.0	9/28/04	9/28/04
Tert-butyl alcohol (TBA)	ND	0.50	µg/g	1.0	9/28/04	9/28/04
Di-isopropyl ether (DIPE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Ethyl tert-butyl ether (ETBE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Benzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Tert-amyl methyl ether (TAME)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Toluene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Ethylbenzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
m,p-Xylene	ND	0.010	µg/g	1.0	9/28/04	9/28/04
o-Xylene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Surrogate: 1,4-Dichlorobenzene-d4	91.0	80.3-107	% Rec	1.0	9/28/04	9/28/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	2.6	1.0	µg/g	1.0	9/28/04	9/28/04

Client Sample ID: 4563-MW14-S10 **Received:** 9/23/04 **Collected:** 9/21/04 0:00
Lab ID: 0409610-02A **Matrix:** Soil

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	0.025	µg/g	1.0	9/28/04	9/28/04
Tert-butyl alcohol (TBA)	ND	0.50	µg/g	1.0	9/28/04	9/28/04
Di-isopropyl ether (DIPE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Ethyl tert-butyl ether (ETBE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Benzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Tert-amyl methyl ether (TAME)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Toluene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Ethylbenzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
m,p-Xylene	ND	0.010	µg/g	1.0	9/28/04	9/28/04
o-Xylene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Surrogate: 1,4-Dichlorobenzene-d4	84.8	80.3-107	% Rec	1.0	9/28/04	9/28/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	1.0	µg/g	1.0	9/28/04	9/28/04

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Date: 05-Oct-04
WorkOrder: 0409610

ANALYTICAL REPORT

Client Sample ID: 4563-MW15-S4 **Received:** 9/23/04 **Collected:** 9/21/04 0:00
Lab ID: 0409610-03A **Matrix:** Soil

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	0.025	µg/g	1.0	9/28/04	9/28/04
Tert-butyl alcohol (TBA)	ND	0.50	µg/g	1.0	9/28/04	9/28/04
Di-isopropyl ether (DIPE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Ethyl tert-butyl ether (ETBE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Benzene	0.0096	0.0050	µg/g	1.0	9/28/04	9/28/04
Tert-amyl methyl ether (TAME)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Toluene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Ethylbenzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
m,p-Xylene	ND	0.010	µg/g	1.0	9/28/04	9/28/04
o-Xylene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Surrogate: 1,4-Dichlorobenzene-d4	91.9	80.3-107	% Rec	1.0	9/28/04	9/28/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	1.7	1.0	µg/g	1.0	9/28/04	9/28/04

Client Sample ID: 4563-MW15-S8 **Received:** 9/23/04 **Collected:** 9/21/04 0:00
Lab ID: 0409610-04A **Matrix:** Soil

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	0.025	µg/g	1.0	9/28/04	9/29/04
Tert-butyl alcohol (TBA)	ND	0.50	µg/g	1.0	9/28/04	9/29/04
Di-isopropyl ether (DIPE)	ND	0.020	µg/g	1.0	9/28/04	9/29/04
Ethyl tert-butyl ether (ETBE)	ND	0.020	µg/g	1.0	9/28/04	9/29/04
Benzene	0.039	0.0050	µg/g	1.0	9/28/04	9/29/04
Tert-amyl methyl ether (TAME)	ND	0.020	µg/g	1.0	9/28/04	9/29/04
Toluene	ND	0.0050	µg/g	1.0	9/28/04	9/29/04
Ethylbenzene	0.54	0.25	µg/g	50	9/28/04	9/29/04
m,p-Xylene	1.6	0.50	µg/g	50	9/28/04	9/29/04
o-Xylene	0.79	0.25	µg/g	50	9/28/04	9/29/04
Surrogate: 1,4-Dichlorobenzene-d4	83.0	80.3-107	% Rec	1.0	9/28/04	9/29/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	220	50	µg/g	50	9/28/04	9/29/04

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Date: 05-Oct-04
WorkOrder: 0409610

ANALYTICAL REPORT

Client Sample ID: 4563-MW16-S4 **Received:** 9/23/04 **Collected:** 9/21/04 0:00
Lab ID: 0409610-05A **Matrix:** Soil

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.2	µg/g	50	9/28/04	9/29/04
Tert-butyl alcohol (TBA)	ND	25	µg/g	50	9/28/04	9/29/04
Di-isopropyl ether (DIPE)	ND	1.0	µg/g	50	9/28/04	9/29/04
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/g	50	9/28/04	9/29/04
Benzene	1.8	0.25	µg/g	50	9/28/04	9/29/04
Tert-amyl methyl ether (TAME)	ND	1.0	µg/g	50	9/28/04	9/29/04
Toluene	0.26	0.25	µg/g	50	9/28/04	9/29/04
Ethylbenzene	1.0	0.25	µg/g	50	9/28/04	9/29/04
m,p-Xylene	1.7	0.50	µg/g	50	9/28/04	9/29/04
o-Xylene	0.86	0.25	µg/g	50	9/28/04	9/29/04
Surrogate: 1,4-Dichlorobenzene-d4	85.2	80.3-107	% Rec	50	9/28/04	9/29/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	560	50	µg/g	50	9/28/04	9/29/04

Client Sample ID: 4563-MW16-S9 **Received:** 9/23/04 **Collected:** 9/21/04 0:00
Lab ID: 0409610-06A **Matrix:** Soil

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	0.057	0.025	µg/g	1.0	9/28/04	9/28/04
Tert-butyl alcohol (TBA)	ND	0.50	µg/g	1.0	9/28/04	9/28/04
Di-isopropyl ether (DIPE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Ethyl tert-butyl ether (ETBE)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Benzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Tert-amyl methyl ether (TAME)	ND	0.020	µg/g	1.0	9/28/04	9/28/04
Toluene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Ethylbenzene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
m,p-Xylene	ND	0.010	µg/g	1.0	9/28/04	9/28/04
o-Xylene	ND	0.0050	µg/g	1.0	9/28/04	9/28/04
Surrogate: 1,4-Dichlorobenzene-d4	87.7	80.3-107	% Rec	1.0	9/28/04	9/28/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	1.8	1.0	µg/g	1.0	9/28/04	9/29/04

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North Coast Laboratories, Ltd.

Date: 05-Oct-04

CLIENT: LACO Associates
Work Order: 0409610
Project: 4563.01, Fortuna Shell

QC SUMMARY REPORT

Method Blank

Sample ID **MB-12202** Batch ID: **12202** Test Code: **8260OXYS** Units: **µg/g** Analysis Date **9/28/04 9:12:00 AM** Prep Date **9/28/04**

Client ID: Run ID: **ORGCMS2_040928B** SeqNo: **453362**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	0.025									
Tert-butyl alcohol (TBA)	ND	0.50									
Di-isopropyl ether (DIPE)	ND	0.020									
Ethyl tert-butyl ether (ETBE)	ND	0.020									
Benzene	ND	0.0050									
Tert-amyl methyl ether (TAME)	ND	0.020									
Toluene	ND	0.0050									
Ethylbenzene	ND	0.0050									
m,p-Xylene	ND	0.010									
o-Xylene	ND	0.0050									
1,4-Dichlorobenzene-d4	0.818	0.10	1.00	0	81.8%	80	107	0			

Sample ID **MB-12202** Batch ID: **12202** Test Code: **GASS-MS** Units: **µg/g** Analysis Date **9/28/04 9:12:00 AM** Prep Date **9/28/04**

Client ID: Run ID: **ORGCMS2_040928A** SeqNo: **453328**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	0.5300	1.0									J

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

North Coast Laboratories, Ltd.

Date: 05-Oct-04

CLIENT: LACO Associates
Work Order: 0409610
Project: 4563.01, Fortuna Shell

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID **LCS-12202** Batch ID: **12202** Test Code: **8260OXYS** Units: **µg/g** Analysis Date **9/28/04 5:10:00 AM** Prep Date **9/28/04**

Client ID: Run ID: **ORGCMS2_040928B** SeqNo: **453359**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.3760	0.025	0.400	0	94.0%	86	137	0			
Tert-butyl alcohol (TBA)	5.847	0.50	8.00	0	73.1%	43	185	0			
Di-isopropyl ether (DIPE)	0.3937	0.020	0.400	0	98.4%	80	137	0			
Ethyl tert-butyl ether (ETBE)	0.3715	0.020	0.400	0	92.9%	81	133	0			
Benzene	0.3948	0.0050	0.400	0	98.7%	74	137	0			
Tert-amyl methyl ether (TAME)	0.3902	0.020	0.400	0	97.6%	81	135	0			
Toluene	0.3877	0.0050	0.400	0	96.9%	69	139	0			
Ethylbenzene	0.4190	0.0050	0.400	0	105%	77	139	0			
m,p-Xylene	0.8726	0.010	0.800	0	109%	74	147	0			
o-Xylene	0.4350	0.0050	0.400	0	109%	62	147	0			
1,4-Dichlorobenzene-d4	1.07	0.10	1.00	0	107%	80	107	0			

Sample ID **LCSD-12202** Batch ID: **12202** Test Code: **8260OXYS** Units: **µg/g** Analysis Date **9/28/04 5:40:00 AM** Prep Date **9/28/04**

Client ID: Run ID: **ORGCMS2_040928B** SeqNo: **453360**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	0.4118	0.025	0.400	0	103%	86	137	0.376	9.08%	20	
Tert-butyl alcohol (TBA)	6.467	0.50	8.00	0	80.8%	43	185	5.85	10.1%	20	
Di-isopropyl ether (DIPE)	0.4381	0.020	0.400	0	110%	80	137	0.394	10.7%	20	
Ethyl tert-butyl ether (ETBE)	0.4245	0.020	0.400	0	106%	81	133	0.372	13.3%	20	
Benzene	0.4429	0.0050	0.400	0	111%	74	137	0.395	11.5%	20	
Tert-amyl methyl ether (TAME)	0.4297	0.020	0.400	0	107%	81	135	0.390	9.62%	20	
Toluene	0.4418	0.0050	0.400	0	110%	69	139	0.388	13.0%	20	
Ethylbenzene	0.4869	0.0050	0.400	0	122%	77	139	0.419	15.0%	20	
m,p-Xylene	0.9733	0.010	0.800	0	122%	74	147	0.873	10.9%	20	
o-Xylene	0.4890	0.0050	0.400	0	122%	62	147	0.435	11.7%	20	
1,4-Dichlorobenzene-d4	1.05	0.10	1.00	0	105%	80	107	1.07	1.93%	15	

Qualifiers: ND - Not Detected at the Reporting Limit; S - Spike Recovery outside accepted recovery limits; B - Analyte detected in the associated Method Blank; J - Analyte detected below quantitation limits; R - RPD outside accepted recovery limits

CLIENT: LACO Associates
Work Order: 0409610
Project: 4563.01, Fortuna Shell

QC SUMMARY REPORT

Laboratory Control Spike

Sample ID **LCSG-12202** Batch ID: **12202** Test Code: **GASS-MS** Units: **µg/g** Analysis Date **9/28/04 7:11:00 AM** Prep Date **9/28/04**
Client ID: Run ID: **ORGCMS2_040928A** SeqNo: **453325**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	21.91	1.0	20.0	0	110%	77	124	0			

Sample ID **LCSDG-12202** Batch ID: **12202** Test Code: **GASS-MS** Units: **µg/g** Analysis Date **9/28/04 7:41:00 AM** Prep Date **9/28/04**
Client ID: Run ID: **ORGCMS2_040928A** SeqNo: **453326**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	23.85	1.0	20.0	0	119%	77	124	21.9	8.49%	20	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

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707-822-4649 Fax 707-822-6831

Chain of Custody

0409610

LABORATORY NUMBER:

Attention: Accounts Payable
Results & Invoice to: LACO Associates
Address: 21 West 4th St
Eureka CA 95501
Phone: 443-5054
Copies of Report to: C. Watt - LACO
Sampler (Sign & Print): [signature] CJW

TAT: ☐ 24 Hr ☐ 48 Hr ☐ 5 Day ☐ 5–7 Day
☒ STD (2–3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSHES

REPORTING REQUIREMENTS: State Forms ☐
Preliminary: FAX ☒ Verbal ☐ By: __/__/__
Final Report: FAX ☐ Verbal ☐ By: __/__/__

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

PROJECT INFORMATION

Project Number: 4563.01
Project Name: Fortuna Shell
Purchase Order Number: TASK 202

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	PRESERVATIVE	CONTAINER	ANALYSIS
	4563-MW14-S4	9/21/04	AM	S	—	13	8260 List 1
	MW14-S10	↓	↓	↓			
	MW15-S4	↓	↓	↓			
	MW15-S8	↓	↓	↓			
	MW16-S4	↓	PM	↓			
	MW16-S9	↓	↓	↓			

SAMPLE CONDITION/SPECIAL INSTRUCTIONS
Geotracker
Evidence of cooling - Sample Temp = 6.3°

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
Christopher [signature]	9/23/04 1:39	Amanda Bout 9/23/04	13:39

SAMPLE DISPOSAL
☒ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

RECEIVED
LACO ASSOCIATES
OCT 20 2004
BY: JG

NORTH COAST
LABORATORIES LTD.

October 15, 2004

CJW

LACO Associates
P.O. Box 1023
Eureka, CA 95502

Order No.: 0410135
Invoice No.: 45582
PO No.:
ELAP No. 1247-Expires July 2006

Attn: Accounts Payable

RE: 4563.01 HPI - Fortuna Shell

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	4563-B12-W20-22
02A	4563-B13-W20-22
03A	4563-B12-W23-25
04A	4563-B12-S24.0
05A	4563-B12-S12.0
06A	4563-B12-S20.0
07A	4563-B12-S16.0

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s)	QA Unit	Jesse G. Chaney, Jr. Laboratory Director

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CLIENT: LACO Associates
Project: 4563.01 HPI - Fortuna Shell
Lab Order: 0410135

CASE NARRATIVE

Gasoline Components/Additives - Soil:
The laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries were above the upper acceptance limit for the surrogate. All analytes were within the acceptance limits; therefore, the data were accepted.

Gasoline Components/Additives - Water:
Sample 4563-B13-W20-22 was reported as ND with a dilution due to insufficient sample volume.

Some reporting limits were raised for sample 4563-B13-W20-22 due to matrix interference.

The LCS/LCSD recoveries were above the upper acceptance limits for ethylbenzene, m,p-xylene and the surrogate. These recoveries indicate that the sample results may be erroneously high. There were no detectable levels of the analytes in the samples; therefore, the data were accepted.

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Date: 15-Oct-04
WorkOrder: 0410135

ANALYTICAL REPORT

Client Sample ID: 4563-B12-W20-22 **Received:** 10/6/04 **Collected:** 9/30/04 0:00
Lab ID: 0410135-01A **Matrix:** Groundwater

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		10/8/04
Tert-butyl alcohol (TBA)	ND	10	µg/L	1.0		10/8/04
Di-isopropyl ether (DIPE)	ND	1.0	µg/L	1.0		10/8/04
Ethyl tert-butyl ether (ETBE)	ND	1.0	µg/L	1.0		10/8/04
Benzene	ND	0.50	µg/L	1.0		10/8/04
Tert-amyl methyl ether (TAME)	ND	1.0	µg/L	1.0		10/8/04
Toluene	ND	0.50	µg/L	1.0		10/8/04
Ethylbenzene	ND	0.50	µg/L	1.0		10/8/04
m,p-Xylene	ND	0.50	µg/L	1.0		10/8/04
o-Xylene	ND	0.50	µg/L	1.0		10/8/04
Surrogate: 1,4-Dichlorobenzene-d4	83.4	72.5-109	% Rec	1.0		10/8/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		10/8/04

Client Sample ID: 4563-B13-W20-22 **Received:** 10/6/04 **Collected:** 9/30/04 0:00
Lab ID: 0410135-02A **Matrix:** Groundwater

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	45	2.0	µg/L	2.0		10/10/04
Tert-butyl alcohol (TBA)	ND	50	µg/L	2.0		10/10/04
Di-isopropyl ether (DIPE)	ND	2.0	µg/L	2.0		10/10/04
Ethyl tert-butyl ether (ETBE)	ND	2.0	µg/L	2.0		10/10/04
Benzene	ND	1.0	µg/L	2.0		10/10/04
Tert-amyl methyl ether (TAME)	ND	2.0	µg/L	2.0		10/10/04
Toluene	ND	1.0	µg/L	2.0		10/10/04
Ethylbenzene	ND	1.0	µg/L	2.0		10/10/04
m,p-Xylene	ND	1.0	µg/L	2.0		10/10/04
o-Xylene	ND	1.0	µg/L	2.0		10/10/04
Surrogate: 1,4-Dichlorobenzene-d4	99.0	72.5-109	% Rec	2.0		10/10/04

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	100	µg/L	2.0		10/10/04

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