ASSOCIATED
ENVIRONMENTAL
GROUP, LLC

May 20, 2013

Ms. Yang J. Na
Na & Na, Inc.
9200 Littlerock Road
Tumwater, Washington 98512

**RE: Remedial Action - Soil Excavation, Groundwater Monitoring Well Installation, and Sampling Letter Report**
Villa Grove Texaco
9200 Littlerock Rd
Tumwater, WA 98512

Dear Ms. Na:

Associated Environmental Group (AEG) has conducted remedial action activities (excavation) to remediate petroleum contaminated soil (PCS) at the Villa Grove Texaco property, located at the above-referenced address in Olympia, Washington (herein referred to as the Site). In addition, AEG drilled, installed, and sampled a monitoring well adjacent to the excavation to replace one that was destroyed during excavation. This letter report summarizes the site background, the field activities, the laboratory analytical results for the soil and samples collected during the remedial action activities, and our recommendations regarding future activities at the Site.

## SITE BACKGROUND

The Villa Grove Texaco property, located at 9200 Little Rock Road in Olympia, Thurston County, Washington, consists of a 2.63–acre parcel occupied by a Texaco brand retail gasoline station, associated convenience store, and an espresso stand (Figure 1, *Site and Vicinity Map*). The Site has three underground storage tanks (USTs) including:

- One 10,000-gallon UST containing regular unleaded gasoline;
- One 8,000-gallon UST containing premium unleaded gasoline; and
- One 6,000-gallon UST containing diesel fuel.

### ENCON Phase II Environmental Site Assessment

In June 2006, ENCON Solutions, Inc. (ENCON) performed a Phase II Environmental Site Assessment at the Site for Mirae Bank. ENCON advanced seven borings around the current UST nest and fuel dispensers. The analytical results from a soil sample collected at boring B1 at 10.5 feet below ground surface (bgs) exhibited benzene at 3.1 milligrams per kilogram (mg/kg). Boring B-1 was located "*...mid-way along the west edge of the main UST field...*" at the Site. The concentration reported exceeded the Washington State Department of Ecology's (Ecology's)

Model Toxics Control Act (MTCA) Method A soil cleanup level for benzene, of 0.03 mg/kg. Analysis of a groundwater sample, collected from the same boring, exhibited 30 micrograms per liter (ug/l) of benzene which exceeded the MTCA Method A groundwater cleanup level of 5 ug/l (ENCON, 2006).

**Tank Tightness Testing**

In May 2007, Josh Raymond of Northwest Tank (NW Tank) conducted tank tightness, line tightness, and leak detector testing at the Site. According to the report prepared by NW Tank, the following were tested:

- One 12,000 gallon regular unleaded UST;
- One 8,000 gallon super unleaded UST;
- One 6,000 gallon Diesel UST; and
- Associated product lines and leak detectors for all three USTs.

The USTs and associated lines passed the tests. A "Certificate of Tightness" was issued for the Site on June 2, 2007 (NW Tank, 2007).

**Gasoline Release and Remediation**

In June 2007, a customer caused a release of approximately 30 gallons of gasoline fuel from a dispenser at the Site. The fuel flowed into a drain that emptied into a ditch, located adjacent to the Site to the west-northwest. The ditch parallels Littlerock Road which runs northeast-southwest.

On June 12, 2007, AEG conducted soil remedial cleanup by excavation of approximately 10 yards of petroleum contaminated soil (PCS) from the ditch via a backhoe. The presence of an 8-inch Puget Sound Energy (PSE) gas line, located on the west-northwest side of this ditch, presented some logistic problems with respect to remediation activities. Additional PCS was removed in areas below and near the gas line via hand shoveling. Confirmation sampling revealed that residual PCS remained in the ditch, at approximately four feet bgs (about 1 foot to 1½ feet) below the PSE gas line.

**Site Characterization**

In February 2008, AEG conducted a Site Characterization of the Site. The objectives of the Site Characterization activities were to evaluate the following:

1) The lateral and vertical extent of gasoline petroleum hydrocarbons impact to the Site and offsite areas. This included:
    - Areas previously identified by ENCON to the north and west, and
    - The area adjacent to the ditch northwest of the Site by the Site's entrance related to the June 2007 fuel release and excavated by AEG.
2) An area of potential concern in the vicinity of the fuel dispensers.

A total of five monitoring wells, MW-1 through MW-5, were installed by AEG on February 21, 2008. Soil samples were collected from the borings for the monitoring wells and water samples collected from the completed wells.

The samples were analyzed for gasoline range organics in accordance with Ecology MTCA Table 830-1, *Required Testing for Petroleum Releases*, including gasoline range Total Petroleum Hydrocarbons (TPH), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and volatile organic compounds (VOCs) including methyl tertiary-butyl ether (MTBE), ethylene dibromide (EDB), 1,2-dichloroethane (EDC), total naphthalenes, and lead. The samples were also analyzed for diesel through mineral oil range TPHs due to presence of a UST containing diesel fuel onsite. The analytical results for all soil and groundwater samples indicated no detectable concentrations for the constituents of concern.

**Installation and Sampling Monitoring Well MW-6 March 2009/April 2010**

In response to a request from Ecology inquiring as to whether the groundwater was still contaminated near boring B-1 that was installed and sampled "*…mid-way along the west edge of the main UST field…*" during the ENCON Phase II in 2006, AEG drilled, and installed monitoring well MW-6 (Figure 1, *Site and Vicinity Map*). Soil and water samples were collected from the boring and the installed monitoring well.

The analytical results for the soil samples revealed that the soil at 10½ and 12 feet bgs contained benzene at 0.79 mg/kg and 0.35 mg/kg respectively. This was above the MTCA Method A Cleanup level of 0.03 mg/kg. Ethylbenzene, total xylenes, and gasoline range TPH were detected below the respective cleanup levels in the sample from 10½ feet bgs and were not detected in the sample from 12 feet bgs.

The groundwater sample collected from monitoring well MW-6 in March 2009 contained 11.9 ug/l of benzene, which is above the MTCA Method A groundwater cleanup level of 5 ug/l. No other contaminants of concern were detected in the groundwater sample from this well at that time.

The water from monitoring well MW-6 was again sampled in April 2010. The results of the analyses on that sample revealed that the concentration of benzene had increased to 59 ug/l and that total xylenes and gasoline range TPH were present at low levels below their respective cleanup levels.

**Oxygen Reducing Compound Treatment (ORC®)**

Based on the results of the of the sample analyses from the soil and groundwater at monitoring well MW-6, it was determined that the contamination appeared to be localized. As a result, AEG proposed to treat the soil and groundwater with Regenesis's Oxygen Releasing Compound (ORC®) to enhance the biodegradation of the benzene. According to Regenesis, ORC® is a:

*"…phosphate-intercalated magnesium peroxide that, when hydrated, produces a controlled release of oxygen for periods of up to 12 months on a single application."*

In July 2010, approximately 675 pounds of ORC slurry was injected in the subsurface through two borings in the area of monitoring well MW-6. A groundwater sample collected in August 2010 after the injection of the ORC slurry revealed that the benzene concentration had decreased to 10 ug/l. While the concentration decreased, it remained above the MTCA Method A cleanup level of 5 ug/l.

**Soil Excavation Proposal 2011**

Based on the results of the groundwater sampling at monitoring well MW-6, it did not appear that the benzene was biodegrading as quickly as anticipated. In an effort to more rapidly clean up the localized contamination, AEG proposed to excavate approximately 90 tons of contaminated soil and transport it to the Wasco County Landfill in The Dalles, Oregon for disposal. Because of a pending land transaction and other issues, this was not able to be accomplished until April 2013.

## SCOPE OF WORK

This portion of the project included:

- The excavation, transport, and disposal of PCS from the location of groundwater monitoring well MW-6 (refer to Figure 1, *Site and Vicinity Map*), using a backhoe operated by AEG's subcontractor, Advance Environmental, Inc.;
- Placement of 300 pounds of ORC-A® in the excavation mixed with the backfill;
- Drilling and installing a 20-foot deep groundwater monitoring well adjacent to the excavation to replace well MW-6 which was destroyed during excavation (Well MW-6R); and
- Sampling the water from the new monitoring well, MW-6R.

**Excavation Activities**

On April 9, 2013, approximately 15.32 tons of petroleum contaminated soil were excavated at the location of monitoring well MW-6 to a depth immediately above the saturated zone (6 feet bgs), using a track-hoe operated by Advance Environmental, Inc. When it was estimated that the contaminated soil was removed, soil samples were collected from the base of the excavation and from the sidewalls. These samples were field screened for petroleum hydrocarbon volatiles using a photo ionization detector (PID) instrument. Because groundwater was found at approximately 4 to 6 feet bgs, further excavation to a deeper depth was not possible. Subsurface conditions at the excavation location generally consisted of a brown gravelly sand with silt to the base of the excavation at 6 feet bgs.

**Backfill and Oxygen Reducing Compound Treatment**

After collection of the samples for field screening, the excavation was backfilled with recycled concrete backfill material and top soil. To accelerate the microbial degradation of any remaining petroleum hydrocarbons in soil, 300 pounds of Regenesis's Oxygen Releasing Compounds-Advanced® (ORC-A®) powder was added to the groundwater accumulated in the excavation at a depth of approximately 6 feet bgs. ORC-A® is an updated formula of the ORC used previously at the site. According to Regenesis, ORC-A® is a:

> *"…calcium oxy-hydroxide that provides controlled-release molecular oxygen to the subsurface environment where it will accelerate the rate of naturally occurring aerobic contaminant biodegradation in groundwater and saturated soils for up to 12 months upon hydration…"*

The excavation backfill was then compacted. Because it was in a landscaped area, the area was re-landscaped and a brick retaining wall replaced. The final dimension of the excavation was approximately 8 feet wide by 12 feet long by 6 feet in depth.

**Soil Disposal**

A total of approximately 15.32 tons of PCS was excavated from the Site. The PCS was loaded onto trucks at the Site and transported to the Wasco County Landfill in The Dalles, Oregon for ultimate disposal and treatment. A copy of the Wasco Landfill Special Waste Application is attached in Appendix A - *Supporting Documents*.

**Well Installation**

During excavation, groundwater monitoring well MW-6 was entirely removed and transported offsite for disposal. To replace the well that was removed, on April 17, 2013, AEG and its subcontractor ESN Northwest drilled and installed a new monitoring well approximately 5 feet south of the excavation.

This well, designated MW-6R, was drilled and constructed using a 9-inch outside diameter/ 4¼-inch inside diameter hollow-stemmed auger. The well was constructed using 2-inch PVC well screen and casing to a depth of 11½ feet bgs. The screened interval is 8½ feet long from 3 feet to 11½ feet bgs. The well was completed a "flush-mount well" per the Ecology regulations, WAC 173-160 - Minimum Standards for Construction and Maintenance of Wells. A copy of the boring log and well construction diagram is attached in Appendix A - *Supporting Documents*. At the time of drilling, water was encountered at a depth of approximately 4 feet bgs.

After construction of the well, it was developed using a submersible pump to remove water with entrained fine grained sediments (fines) from the vicinity of the well screen. This was to allow the water to flow freely from the formation into the well, and also reduce the turbidity of the water during sampling. The well was then allowed to equilibrate with the formation for approximately 12 days before it was sampled.

**Sampling and Analyses**

On April 29, 2013, AEG sampled Well MW-6R. Upon arriving at the site, a depth to water measurement was obtained and the well assessed for the presence of potential light non-aqueous phase liquid (LNAPL) i.e. free product. The well was then sampled following industry standard low-flow purging and sampling techniques. The sample was collected in laboratory-provided containers and placed in a portable chilled ice chest for transport to a Washington State accredited environmental laboratory for analysis (Libby Environmental, Inc.)

The samples were analyzed for TPH-G and the fuel associated BTEX.

## RESULTS

The results from the analyses as well as the historical analytical results from the destroyed well WDOE-6A are presented in the attached Table 1 - *Summary of Groundwater Analytical Results*. The laboratory datasheets from Libby Environmental, Inc. are attached in Appendix A - *Supporting Documents*.

The analytical results of the sample collected did not detect gasoline range TPH or the associated volatile constituents above the laboratory reporting levels.

## RECOMMENDATIONS

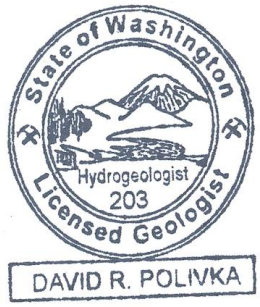
Based on the analytical results it appears that the residual contamination may have been removed. However in order to achieve site "closure" Ecology requires that four consecutive quarters of clean groundwater samples be collected. As a result AEG is recommending that three additional quarters of groundwater monitoring be conducted. If the contaminants of concern remain non detectable or below the MTCA cleanup levels, then a "No Further Action" (NFA) request should be submitted to Ecology.

Please do not hesitate to contact us at 360-352-9835 should you have questions or require additional information.

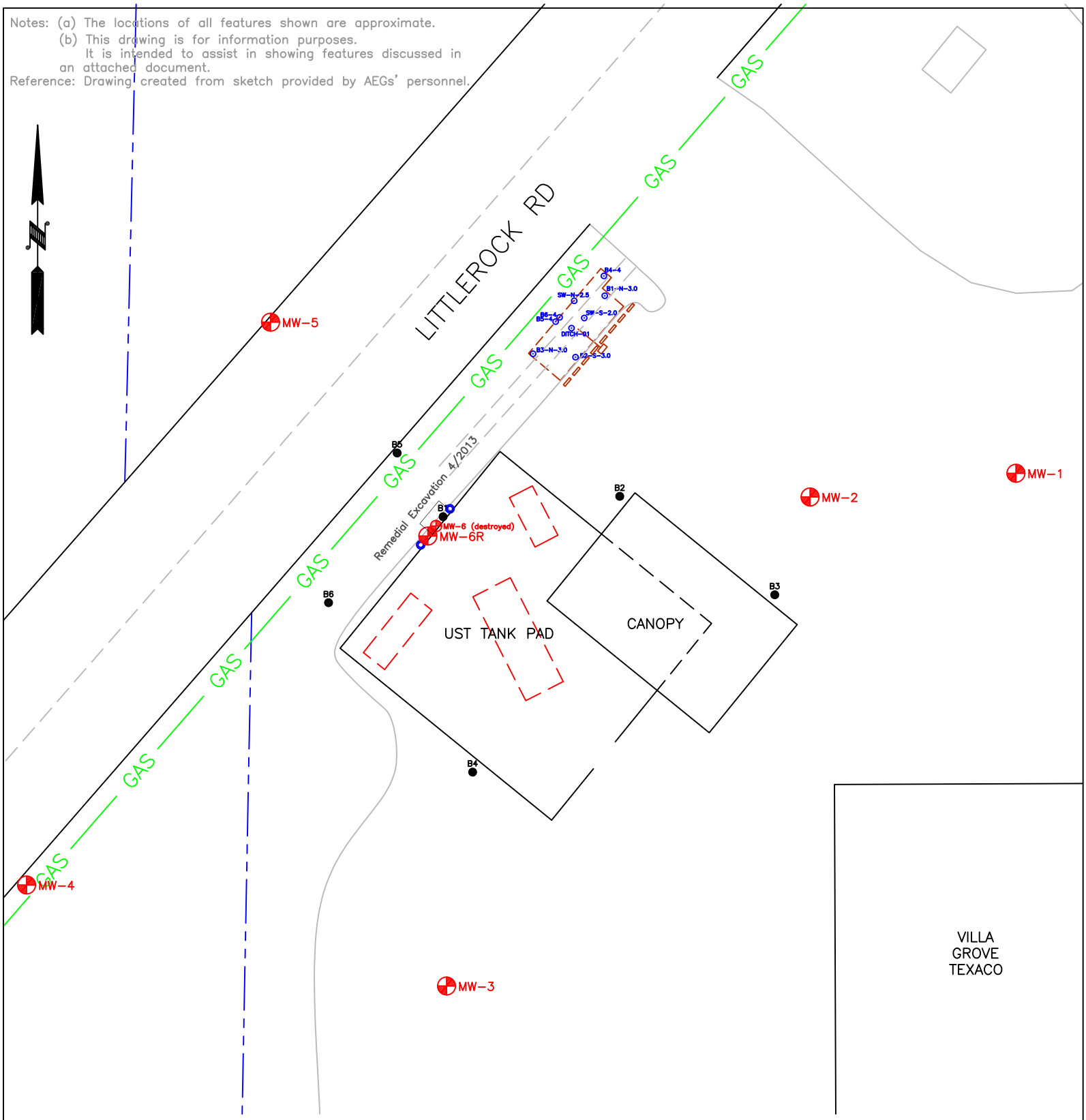
Sincerely,

Associated Environmental Group, LLC

David R. Polivka, L.G./L.H.G.
Senior Project Hydrogeologist




Attachments: Figure 1 - *Site and Vicinity Map*
Table 1 – *Summary of Soil Analytical Results* (Special Waste Application, boring log and laboratory datasheets)
Appendix A – *Supporting Documents*
Appendix B – Site Photographs




LEGEND

- AEG MONITORING WELLS
- ENCON BORINGS 06/19/06
- AEG EXCAVATION SAMPLES
- ORC INJECTION POINTS 7/09/09

SCALE: 1"=30 FEET

0 15 30 60

ASSOCIATED ENVIRONMENTAL GROUP, LLC
1728 State Avenue NE, Suite 101
Olympia, WA 98506
(360) 352-9835 Fax (360) 352-8164

FIGURE 1

SITE and VICINITY MAP

VILLA GROVE TEXACO
9200 LITTLEROCK RD
TUMWATER, WA

| Project# 07-158 | Date: 5/17/2013 |
|---|---|
| File: VILLA GROVE | Sheet |

**Table 1 Summary of Groundwater Analytical Results**
**Villa Grove Texaco**
**Tumwater , WA**

| Sample Number[1] | Date Collected | BTEX[2] (µg/L) | | | | Gasoline[3] (µg/L) | Table 830-1 Constituents[2] (µg/L) | | | | Lead[5] (µg/L) | Diesel Extended[6] (µg/L) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Benzene** | Toluene | Ethylbenzene | Total Xylenes | | 1,2-Dichloroethane (EDC) | 1,2-Dibromoethane (EDB) | Total Naphthalenes | MTBE | | Diesel | Heavy Oil | Mineral Oil |
| MW-1 | 2/26/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| | 5/31/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| MW-2 | 2/26/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| | 5/31/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| MW-3 | 2/26/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| | 5/31/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| MW-4 | 2/26/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| | 5/31/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| MW-5 | 2/26/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| | 5/31/2008 | <1 | <1 | <1 | <1 | <100 | <1 | <0.01 | <5 | <5 | <5.0 | <200 | <400 | <400 |
| MW-6 | 3/27/2009 | **11.9** | <2 | <1 | <3 | <100 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 4/2/2010 | **59** | <2 | <1 | 7 | 220 | -- | -- | -- | -- | -- | -- | -- | -- |
| | 8/11/2010 | **10** | <1 | <1 | <3 | <100 | -- | -- | -- | -- | -- | -- | -- | -- |
| MW-6R | 4/29/2013 | <1 | <2 | <2 | <2 | <100 | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Practical Quantitation Limit | | 1 | 1 or 2 | 1 | 1 or 3 | 100 | 1 | 0.01 | 5 | 5 | 5 | 200 | 400 | 400 |
| Ecology MTCA Method A Cleanup Levels | | 5 | 1000 | 700 | 1000 | 1,000 [4] | 5 | 0.01 | 160 | 20 | 15 | 500 | 500 | 500 |

Notes:

[1]Approximate monitoring well locations are shown in Figure 1

[2]Analyzed by EPA Method 8260B. B = benzene, T = toluene, E = ethylbenzene, X = total xylenes

[3]Analyzed by Northwest Method NWTPH-Gx

[4]Cleanup level without presence of benzene

[5]Analyzed by EPA Method 7421

[6]Analyzed by Northwest Method NWTPH-Dx/Dx Extended

µg/L = micrograms per liter

MTBE= Methyl t-butyl ether

< = not detected above laboratory detection limits.

-- = not tested for constituent

Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level

* Ecology has not designated a cleanup level for this constituent

# APPENDIX-A
# Supporting Documents

## (Special Waste Application; Boring Log; Laboratory Datasheets)

**Wasco Landfill**
2550 Steele Road
The Dalles, OR 97058
PH: 541.296.4082
FX: 541.296.6449

# SPECIAL WASTE APPLICATION

**FOR OFFICE USE ONLY**
APPROVAL NUMBER:
EXPIRATION DATE:
APPROVED BY:

Information utilized for completion of this form must originate from an authorized representative of the generator of the waste material.
The information on this form must be **COMPLETELY FILLED OUT, TYPE WRITTEN,** and the form must be **SIGNED BY AUTHORIZED REPRESENTATIVE.**

## A. PROFILE INFORMATION

1. ☒ Initial ☐ Recertification, list prior approval number(s):
2. Have there been any changes to the composition of, or process generating this waste stream that would alter the characteristics of the waste stream?
☐ YES ☒ NO (Updated analysis may be required even if no change to process or composition.)

## B. GENERATOR INFORMATION

1. Generator Name: Villa Grove Texaco
2. Address: 9200 Littlerock Rd. SW
City: Olympia | County: Thurston
State: WA | Zip: 98512
3. Site Location (if different):
4. Contact Name: Matthew Wilson
5. Phone Number: (360) 485-2231 | 6. Fax Number: (360) 352-8164
7. Email Address: mwilson@aegwa.com
8. State Facility ID # (if applicable):
9. State Waste Code (if applicable):

## C. CUSTOMER/BILLING INFORMATION

1. Billing Name: Associated Environmental Group, LLC
2. Address: 605 11th Ave. SE Suite 201
City: Olympia | County: Thurston
State: WA | Zip: 98501
3. Contact Name: Michael Chun
4. Phone Number: (360) 352-9835 | 5. Fax Number: (360) 352-8164
6. Email Address: mchun@aegwa.com
7. Is there a service agreement on file? ☐ YES ☒ NO
8. Agent / Consultant: Associated Environmental Group, LLC
9. Letter of Authorization: ☐ YES ☒ NO

## D. TRANSPORTER/SHIPPING INFORMATION

1. Name: To be determined
2. Street Address:
City: | State: | Zip:
3. Phone Number: | 4. Fax Number:
5. Contact Name:
6. Email Address:
7. EPA or State Transporter ID #:
8. Packaging: ☐ Bulk Solids ☐ Bulk Liquids ☐ Drums ☐ Roll-Off
☒ Dump Truck ☐ Tank Truck ☐ Vacuum Box ☐ Bagged
9. Estimated Volume: 16
☒ Tons ☐ Cubic Yards ☐ Drums ☐ Gallons ☐ Other: _____
10. Shipping Frequency: _____ per: ☒ One Time Project
☐ Month ☐ Quarter ☐ Year ☐ Other: _____

## E. WASTE STREAM INFORMATION

1. Common Name of Material or Waste Stream:
Soil
2. Detailed Description of Process or How Generated (Attach additional sheet if needed):
Excavation
3. Physical State at 70°F: ☒ Solid ☐ Semi-Solid ☐ Sludge
☐ Liquid ☐ Powder ☐ Other _____
4. Free Liquids: ☒ NO ☐ YES % Liquids:
5. Color: Brown | 6. pH Range: 7
7. Odor: ☒ None ☐ Mild ☐ Significant Describe:
8. Flash Point: 165 ☒ °F ☐ °C
9. Reactive: ☒ NO ☐ YES with:
10. State Required Information (if applicable):

## F. NON-HAZARDOUS DETERMINATION

1. Attached Document(s) (check all that apply): ☐ Not Applicable ☐ Process Knowledge ☐ MSDS ☒ Certified Analytical Report ☐ Exempt Waste
2. If Process Knowledge, provide details:
3. If analytical data is attached, is the data derived from testing a representative sample in accordance with 40 CFR 261 and/or other applicable laws?
☐ YES ☐ NO Type of Sample: ☐ Composite ☒ Grab Analysis Provided:
4. If Exempt Waste, check applicable item below: ☐ UST Corrective Action – 40 CFR 261.4(b)(10) ☐ PCB Bulk Product Waste – 40 CFR 761.62
☐ Oil & Gas E&P Waste – 40 CFR 261.4(b)(5) ☐ RCRA-Empty Containers – 40 CFR 261.7 ☒ Other (provide reference):

## G. GENERATOR CERTIFICATION STATEMENT:

I hereby certify that all information contained herein is true and correct, and the material described is properly identified, classified, packaged, labeled, and prepared as indicated. I certify this waste is not hazardous or dangerous as defined by the U.S. EPA, or the state or province of origin. I certify this waste does not contain any regulated radioactive materials, that all known and suspected hazards have been disclosed, and that the waste is not a regulated hazardous waste by government or local authority, and does not contain PCB's regulated by TSCA or any other regulatory authority. I certify that all samples used for this analysis are representative of the materials described herein. I understand that all wastes may undergo inspection upon arrival at the designated facility and may be refused if the delivered material does not conform to the description herein. Notification will be provided immediately if there is a change in the composition of, or process generating this waste stream, prior to offering the waste for shipment or management.

Matthew Wilson
AUTHORIZED REPRESENTATIVE NAME/TITLE

AEG, LLC
COMPANY NAME

AUTHORIZED REPRESENTATIVE SIGNATURE

4/1/13
DATE COMPLETED

**ASSOCIATED ENVIRONMENTAL GROUP, LLC** **LOG OF BOREHOLE**

| | | | |
|---|---|---|---|
| **PROJECT:** | Villa Grove Texaco | **JOB # 07-158** | **BORING /WELL # MW-6R** **PAGE 1 OF 1** |
| **Location:** | 9200 Littlerock Road Tumwater, Washington | **Approximate Ground Surface Elevation*: 178' (WGS84 datum)** | |
| **Subcontractor/Equipment:** | ESN Northwest/Power Probe 9630 | **Drilling Method:** 4.25"- inch Inside Diameter Hollow Stem Auger | |
| **Date** | 4/17/2013 | **Logged By:Matt Wilson** | |

| Depth (ft) | Soil Description | Unified Soil Symbol | Sample Type | Sample Recovery | Sample Number | Time | Blows/Foot | PID Reading (ppm) | Sheen | Monitoring Well |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dark Brown, moist, silty SAND with gravel. | SW | | | N/A | 1145 | N/A | 1.3 | not obs. | |
| | | ATD | | | | | | | | |
| 5 | Dark Brown, saturated, silty SAND with gravel | SW | | | N/A | 1155 | N/A | | | |
| 10 | | | | | N/A | 1210 | N/A | 0.8 | not obs. | |
| | Total depth 11 1/2 feet bgs.<br>Groundwater encountered at 4 feet bgs, at time of drilling.<br>Boring completed as monitoirng well MW-6R (Ecology Well ID Tag # BHK316 | | | | | | | | | 2" Schedule 40 PVC casing w/ 8 1/2' of 0.010" slotted screen |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 25 | | | | | | | | | | |

**Explanation**

- 2-inch O.D. split spoon sample
- No Recovery
- Contact located approximately
- ATD — Groundwater level at time of drilling or date of measurement

Monitoring Well
- Clean Sand
- Bentonite
- Grout/Concrete
- Screened Casing
- Blank Casing

Flush-mount Monument

*Approximate Elevation from Google Earth Image 9/3/2011

ESN NORTHWEST, INC. Environmental Services Network

# CHAIN-OF-CUSTODY RECORD

CLIENT: AEG

ADDRESS: 1728 STATE AVE NE #101 OLYMPIA, WA

PHONE: (360) 357-9835 FAX: (360) 357-8164

CLIENT PROJECT #: _____ PROJECT MANAGER: M. CHON

DATE: 3/11/09 PAGE 1 OF 1

PROJECT NAME: VILLA GROVE

LOCATION: TUMWATER, WA

COLLECTOR: D. THOMAS DATE OF COLLECTION 3/11/09

| Sample Number | Depth | Time | Sample Type | Container Type | TPH-HCID | TPH - DIESEL & OIL | TPH - GASOLINE | BTEX | VOC 8260CL | VOC 8260 | SemiVol 8270 | PAH's 8270 | PCB's 8082 | CL Pesticides 8081 | RCRA 8 Metals | MTCA 5 Metals | Pb | Asbestos-PLM | GRO Suite | DRO Suite | WO Suite | NOTES | Total Number of Containers | Laboratory Note Number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. MW6-S1-10.5 | 10.5 | 1505 | SOIL | VOA, JAR | | | X | X | | | | | | | | | | | | | | | 3 | |
| 2. MW6-S2-12.0 | 12.0 | 1510 | SOIL | VOA, JAR | | | X | X | | | | | | | | | | | | | | | 3 | |
| 3. | | | | | | | | | | | | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | | | | | | | | | | |
| 11. | | | | | | | | | | | | | | | | | | | | | | | | |
| 12. | | | | | | | | | | | | | | | | | | | | | | | | |
| 13. | | | | | | | | | | | | | | | | | | | | | | | | |
| 14. | | | | | | | | | | | | | | | | | | | | | | | | |
| 15. | | | | | | | | | | | | | | | | | | | | | | | | |
| 16. | | | | | | | | | | | | | | | | | | | | | | | | |
| 17. | | | | | | | | | | | | | | | | | | | | | | | | |
| 18. | | | | | | | | | | | | | | | | | | | | | | | | |

| RELINQUISHED BY (Signature) | DATE/TIME | RECEIVED BY (Signature) | DATE/TIME |
|---|---|---|---|
| [signature] | 3/11/09 1535 | [signature] | 3/11/09 1535 |
| RELINQUISHED BY (Signature) | DATE/TIME | RECEIVED BY (Signature) | DATE/TIME |

**SAMPLE DISPOSAL INSTRUCTIONS**

☐ ESN DISPOSAL @ $2.00 each ☐ Return ☐ Pickup

| SAMPLE RECEIPT | |
|---|---|
| TOTAL NUMBER OF CONTAINERS | |
| CHAIN OF CUSTODY SEALS Y/N/NA | |
| SEALS INTACT? Y/N/NA | |
| RECEIVED GOOD COND./COLD | |
| NOTES: | |

LABORATORY NOTES:

Turn Around Time: 24 HR 48 HR (5 DAY)

**ESN NORTHWEST CHEMISTRY LABORATORY**

AEG
VILLA GROVE PROJECT
Tumwater, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

**Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8260) in Soil**

| Sample Number | Date Analyzed | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Xylenes (mg/kg) | Gasoline (mg/kg) | Surrogate Recovery (%) |
|---|---|---|---|---|---|---|---|
| Method Blank | 3/12/2009 | nd | nd | nd | nd | nd | 109 |
| LCS | 3/12/2009 | 105% | 110% | 101% | 108% | --- | 102 |
| MW6-S1-10.5 | 3/12/2009 | **0.79** | nd | **0.17** | **0.36** | **12** | 116 |
| MW6-S1-10.5 Duplicate | 3/12/2009 | **1.1** | nd | **0.29** | **0.55** | **16** | 116 |
| MW6-S2-12.0 | 3/12/2009 | **0.35** | nd | nd | nd | nd | 117 |
| MS | 3/12/2009 | 100% | 104% | 99% | 109% | --- | 122 |
| MSD | 3/12/2009 | 103% | 109% | 101% | 110% | --- | 139 |
| Method Detection Limits | | 0.02 | 0.05 | 0.05 | 0.15 | 10 | |

"---" Indicates not tested for component.
"nd" Indicates not detected at the listed detection limits.
"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Chlorobenzene) & LCS : 65% TO 135%

# Libby Environmental, Inc.

# Chain of Custody Record

4139 Libby Road NE
Olympia, WA 98506
Ph: 360-352-2110
Fax: 360-352-4154

Date: 11/7/08 Page: 1 of 1

Client: AEG

Project Manager: M. CHUN

Address: 1728 STATE AVE 9 NE, OLYMPIA

Project Name: VILLA GROVE - CONFIRMATION SOIL SAMPLING

Phone: 360-352-9835 Fax: -8164

Location: 9200 LITTLE ROCK RD, OLYMPIA, WA

Client Project # 07-188

Collector: Y. VAN Date of Collection: 11/7/08

| Sample Number | Depth | Time | Sample Type | Container Type | VOA 8021B | VOA 8021B BTEX Only | VOA 8260 | SEMI VOL 8270 | NWTPH-HCID | NWTPH-Gx | NWTPH-Dx | NWTPH-Dx Ext. | PAH 8270 | PCB's 8082 | MTCA 5 Metals | | | Field Note/# Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 B6-4 | 4.0 | 1430 | Soil | VOA, Jar | | X | | | | X | | | | | | | | 3 |
| 2 | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | | |

| Relinquished by: | Date / Time | Received by | Date / Time |
|---|---|---|---|
| | 11/7/08 4:45pm | | |
| Relinquished by: | Date / Time | Received by | Date / Time |
| | | | 11/7/08 4:15 |
| Relinquished by: | Date / Time | Received by | Date / Time |
| | | | |

Sample Receipt:

| | |
|---|---|
| Good Condition? | |
| Cold? | |
| Seals Intact? | |
| Total Number of Containers | |

Remarks:

TAT 24HR 48HR 5-Day

Distribution White - Lab, Yellow - File, Pink - Originator

## LIBBY ENVIRONMENTAL CHEMISTRY LABORATORY

VILLA GROVE-CONFIRMATION SOIL SAMPLING PROJECT
Olympia, Washington
AEG, Inc.
Client Project #07-188

**Analyses of Gasoline (NWTPH-Gx) & BTEX (EPA Method 8021B) in Soil**

| Sample Number | Date Analyzed | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Xylenes (mg/kg) | Gasoline (mg/kg) | Surrogate Recovery (%) |
|---|---|---|---|---|---|---|---|
| Method Blank | 11/14/08 | nd | nd | nd | nd | nd | 98 |
| LCS | 11/14/08 | 100% | 107% | | | | 97 |
| B6-4 | 11/14/08 | nd | nd | nd | nd | nd | 98 |
| B6-4 Dup | 11/14/08 | nd | nd | nd | nd | nd | 85 |
| MS | 11/14/08 | 84% | 110% | | | | 101 |
| Practical Quantitation Limit | | 0.02 | 0.10 | 0.05 | 0.15 | 10 | |

"nd" Indicates not detected at the listed detection limits
"int" Indicates that interference prevents determination

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Trifluorotoluene): 65% TO 135%

ANALYSES PERFORMED BY: Sherry Chilcutt

# APPENDIX-B
# Site Photographs

ASSOCIATED
ENVIRONMENTAL
GROUP, LLC

# SITE PHOTOGRAPHIC RECORD

**Project No.: 07-158** **Project Name: Villa Grove Texaco Soil Excavation**

| Photo #1: | *Excavating Soil at Location of Former Monitoring Well MW-6 (Looking West)* |
|---|---|

| Photo #2: | *Groundwater Accumulating in Excavation* |
|---|---|

| Photo #3: | *ORC®-A Staged for Mixing in Excavation (Looking Northeast)* |
|---|---|

| Photo #4: | *Mixing ORC®-A in Excavation Before Backfilling* |
|---|---|

| Photo #5: | *Backfilling Excavation (Looking East)* |
|---|---|

| Photo #6: | *Drilling Replacement Monitoring Well MW-6R South of Excavation (Looking East)* |
|---|---|

605 11th Avenue SE, Suite 201 • Olympia, WA • 98501
Phone: 360-352-9835 • Fax: 360-352-8164 • Email: admin@aegwa.com