REMEDIAL INVESTIGATION WORK PLAN

FORMER CHEVRON TERMINAL NO. 100-1157
WONDRACK PROPERTY
15th STREET AND WATER STREET
ELLENSBURG, WASHINGTON

AUGUST 9, 2002

FINAL

Delta Environmental Consultants, Inc.

Inogen® Environmental Alliance

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1.0 INTRODUCTION

This Remedial Investigation (RI) Work Plan describes proposed tasks designed to further define the nature and extent of petroleum hydrocarbon impacts observed in shallow soils and groundwater at locations both on and surrounding former Chevron Facility No. 100-1157, located in Ellensburg, Washington. This Workplan has been produced by Delta Environmental Consultants, Inc. (Delta) on behalf of Chevron Products Company (Chevron) and is being submitted to the Washington State Department of Ecology (Ecology) in partial fulfillment of the requirements set forth in Agreed Order No. DE02TCPCR-3982.

This work plan defines the purpose, scope and methods to be used while conducting an RI in support of the development of a Feasibility Study (FS) and Corrective Action Plan (CAP) for the Site. As stated in WAC 173-340-350, the purpose of the remedial investigation is to collect sufficient information regarding the site to enable the selection of a cleanup action plan under WAC 173-340-360. The purpose of this investigation is to determine the vertical and lateral extent of a petroleum hydrocarbon plume that has been observed in shallow vadose soils surrounding the site.

2.0 BACKGROUND INFORMATION

2.1 Site Description

Former Chevron Facility No. 100-1157 (the Site) is currently owned by Mr. Joseph Wondrack and is located in Kittitas County at the northwest corner of 15th and Water Streets in Ellensburg, Washington. The property is located within Township 18, Range 18, Section 35, Parcel No. 18-18-3554-2210. A site location map is provided as **Figure 1**. The site is currently an unpaved open lot on an approximately ¾-acre triangular parcel partly enclosed by a chain link fence. The storage tanks (both above-ground and underground) and all associated fuel distribution lines and buildings, except for a garage in the southwest corner of the property, have been removed. The layout of the lot, including the locations of the former tanks and buildings is presented in **Figure 2.** The area surrounding the Site is a mix of residential and commercial properties. The John Wayne/Iron Horse Trail (formerly property belonging to the Chicago, Milwaukee, St. Paul & Pacific Railroad) lies directly north of the site. The site is bounded by

Water Street and a city park to the east and a vacant field to the west of the site. To the south, the site is bounded by 15th Street, which runs east-west. Residential homes line the south side of 15th Street.

2.2 Site History

The Site was originally developed by Standard Oil Company (now Chevron Products Company) around 1918 and used as a bulk fuel storage and transfer facility. The property was sold by Chevron in 1980 to ARH Distributors. The facility was later purchased from ARH by Wondrack Distributing in 1986 and ceased operations shortly thereafter. The storage tanks, distribution lines and buildings, except for a garage in the southeast corner of the parcel were removed in 1997.

In November 1995, the City of Ellensburg, while performing trenching related to the installation of a new sewer line for the 1400 block of Water Street, encountered a 2-foot thick seam of petroleum impacted soil which extended some distance on both sides of the trench. The City of Ellensburg notified Ecology. Analysis of the impacted soil indicated that the petroleum resembled a weathered aviation fuel or kerosene. The petroleum-impacted soils encountered were removed and transported to another location by the City of Ellensburg for treatment and disposal. The sewer line was completed and backfilled with clean soils.

In the fall of 1999, a television cable-trench was dug to a depth of approximately three-feet below grade within the city Right-of-Way (ROW) in front of the Site (presumably running east-west along 15th Street). Petroleum-impacted soils were observed several hundred yards west or the property boundaries within the two-foot wide trench. The company performing the cable trenching and installation reported its findings to Ecology, which conducted an Initial Investigation (II).

2.3 Previous Investigations

Following the discovery of petroleum impacted soils by the City of Ellensburg in the sewer line trench along Water Street in November 1995, the city contracted Sage Earth Sciences, Inc. (SAGE) of Zillah, Washington to collect samples of the impacted soils. On November 7, 1995, SAGE conducted field activities, which include inspection of the trench for signs of petroleum impact and collected one soil and one groundwater sample from within the excavated trench.

SAGE submitted the samples to Edge Analytical, Inc. in Burlington, Washington for gasoline, diesel and Benzene, Toluene, Ethlybenzene and Xylenes (BTEX) analysis. These samples were also later analyzed for total recoverable petroleum hydrocarbons and flashpoint. On November 14, 1995, SAGE collected an additional soil sample from a location approximately 40-feet north of the initial sampling location. This second sample was collected near the southwest corner of the intersection of 15th and Water Streets and submitted for petroleum hydrocarbon identification analysis. This sample was later analyzed using WTPH-D. This analysis found kerosene range petroleum hydrocarbons at a concentration of 101 parts per million (ppm). Re-analysis of the soil sampled collected on November 7th indicated a concentration of 195 ppm of kerosene range petroleum hydrocarbons. Results for the groundwater sample collected by SAGE on November 7th were non-detect for TPH and BTEX compounds.

In 1997, the Kittitas County Health Department completed a Site Hazard Assessment (SHA) of the Site as required under by Model Toxics Control Act (MTCA). The SHA and resulting ranking is an estimate of the potential threat to human health and/or the environment a site poses with respect to other sites in the State of Washington. As a component of the SHA, 12 randomly selected test-pits were dug and soil samples were collected from each test-pit at up to three different depths (see **Figure 2** for test-pit locations). These soil samples were analyzed for BTEX compounds, gasoline, diesel and oil. Results of this analysis indicated that petroleum impacts to soil at concentrations above MTCA Method A cleanup levels were present both on and southeast of the site. Analytical data from these soil samples is included in **Attachment A**. As a result, the site was given a ranking of 2, where 1 represents the highest risk and 5 the lowest.

Between July 23rd and August 7th 1998, Terra Vac of Seattle, Washington, on behalf of Chevron Products Company, performed a site assessment at the Site in response to the SHA ranking. As part of this assessment, Terra Vac performed eight soil borings and completed each boring as a monitoring well (MW-1 through MW-8). Soil samples were collected from each soil boring and analyzed for gasoline, diesel fuel, oil and the BTEX compounds. Following completion of the borings as monitoring wells, Terra Vac collected groundwater samples from each well and submitted them for analysis using the same analytical methods used for soil. In

addition, groundwater samples from select wells were also analyzed for dissolved lead by EPA 6000/7000 series methods. The results of this assessment indicated that shallow soil beneath the site had been impacted by gasoline, diesel and oil range petroleum hydrocarbons. Three of the eight soil samples collected (MW-2, MW-6 and MW-7) contained diesel range petroleum hydrocarbons at concentrations exceeding MTCA Method A cleanup levels, two of the eight samples (MW-7 and MW-8) contained gasoline range petroleum hydrocarbons at concentrations exceeding MTCA Method A cleanup levels and one of the soil samples collected (MW-2) contained petroleum hydrocarbons as oil at concentrations exceeding MTCA Method A cleanup levels (see **Figure 3**). None of the soil samples collected contained BTEX compounds at concentrations exceeding MTCA Method A cleanup levels. Groundwater samples from six of the eight wells (MW-2, MW-4, MW-5, MW-6, MW-7 and MW-8) contained gasoline range hydrocarbons at concentrations exceeding MTCA Method A cleanup levels, four of the eight samples (MW-3, MW-4 MW-7 and MW-7) contained diesel range petroleum hydrocarbons at concentrations exceeding MTCA Method A cleanup levels and one of the groundwater samples collected (MW-7) contained benzene at a concentration exceeding MTCA Method A cleanup levels. None of the eight-groundwater samples collected contained dissolved lead at concentrations at or above the laboratory reporting limits or exceeding MTCA Method A cleanup levels. Analytical data from both the soil and groundwater samples collected during this site assessment are included in **Attachment A.**

Beginning in 1998, following the installation of the groundwater monitoring wells, a quarterly groundwater monitoring and sampling program was instituted. Results from the on-going groundwater monitoring indicate that petroleum hydrocarbon concentrations at the site have declined. Results from the last monitoring and sampling event indicate that none of the eight on-site wells have contained BTEX compounds or petroleum hydrocarbons as gasoline, diesel, or oil at concentrations above the MTCA Method A cleanup levels since February 2000. Groundwater analytical data for this site is included in **Attachment A.**

Numerous reports have been produced which contain a more detailed accounting of the previous investigations conducted at this site, these reports include the following:

- Groundwater Monitoring and Sampling Report, Event of February 2, 2001, Gettler-Ryan, Inc., March 1, 2000.
- Groundwater Monitoring and Sampling Report, Event of November 10, 2000, Gettler-Ryan, Inc., January 17, 2001.
- Groundwater Monitoring and Sampling Report, Event of August 12, 2000, Gettler-Ryan, Inc., October 3, 2000.
- Groundwater Monitoring and Sampling Report, Event of May 9, 2000, Gettler-Ryan, Inc., July 11, 2000.
- Groundwater Monitoring and Sampling Report, Event of February 25, 2000, Gettler-Ryan, Inc., March 29, 2000.
- Groundwater Monitoring and Sampling Report, Fourth Quarter 1999- Event of November 17, 1999, Gettler-Ryan, Inc., January 7, 2000.
- Groundwater Monitoring and Sampling Report, Third Quarter 1999- Event of September 5, 1999, Gettler-Ryan, Inc., October 25, 1999.
- Groundwater Monitoring and Sampling Report, Second Quarter 1999- Event of June 7, 1999, Gettler-Ryan, Inc., August 5, 1999.
- First Quarter 1999, Groundwater Monitoring and Sampling Report, Gettler-Ryan, Inc., February 26, 1999.
- Groundwater Monitoring and Sampling Report, Fourth Quarter 1998- Event of October 27, 1998, Gettler-Ryan, Inc.
- Investigation Report, Former Chevron Bulk Fuel Terminal #100-1157, Terra Vac, September 25, 1998.
- Site Hazard Assessment, Kittitas County Health Department, Mr. Gerald Tousley, July 7, 1997.
- Wondrack Distributing, Analytical Report No. 63724, Sound Analytical Services, Inc., April 10, 1997.
- Analytical Results for Samples Collected at the Sewer Line Installation Site, Ellensburg, WA., Sage Earth Sciences, Inc., November 27, 1995.

These previous investigations have identified various contaminants in the soil and groundwater at the Site including gasoline, diesel and oil range petroleum hydrocarbons. Also identified in groundwater are the BTEX components- benzene, ethylbenzene, toluene and xylenes. To date,

8 monitoring wells and 12 test pits have been installed at the Site. Groundwater has been monitored routinely since 1998. The majority of known hydrocarbon impact at the Site is in the south central portion of the site and appears to extend off-site in a southeast direction.

Previous characterization of the site indicates subsurface soils typically consist of very dense clayey gravel and sand with course grained gravel and trace cobbles which extend to at least 15 feet below ground (bg), the maximum depth explored. Material in the subsurface is brown and dark green in color, moist to wet in water content and dense to very dense in compaction.

Shallow groundwater beneath the Site typically occurs from about 3.2 to 5.75 feet bgs with seasonal fluctuations of 0.5 to 1.0 feet. The shallow groundwater migration direction is generally to the south-southeast with minor variations due to localized mounding. Hydraulic gradients across the site are typically low, ranging from about 0.003 to 0.006 ft/ft.

3.0 OBJECTIVES

The primary objective of this supplemental investigation is to further assess and document the nature and extent of petroleum hydrocarbon impacts to vadose soil and groundwater both within the property boundaries of the Site and southeast of the Site in the Water Street and 15th Street Right-of-Ways (ROWs). Previous trenching and street improvement activities in both of these streets have encountered petroleum-impacted soils that have been linked to the Site. To accomplish these objectives, Delta proposes to dig twenty test-pits both on and off-site in the City of Ellensburg public ROWs surrounding the site. Seven of these test-pit may be extended as trenches across the City ROW if hydrocarbon impacts to soil are encountered within the test-pits to determine if subsurface utility trenches beneath 15th Street are acting as preferential conduits for hydrocarbon migration. Proposed test-pit locations are presented as **Figure 4**.

4.0 SCOPE OF WORK

The scope of work for this supplemental investigation will include the following tasks:

- Locate underground utilities and improvements, if present, at 20 proposed test-pit locations;

- Obtain all appropriate street-use and trenching/excavation permits required to complete this investigation;
- Complete test-pits at 20 locations to a maximum depth of 6 feet bgs;
- Possibly extend up to seven of the proposed test-pits on the north side of 15th Street southerly across 15th Street;
- Collect soil samples from three different depths (0-2 ft, 2-4 ft and >4 ft) in each test-pit;
- Screen soil samples collected for organic vapors, staining and sheen;
- Collect groundwater samples from each test-pit where groundwater is encountered;
- Analyze soil samples (and duplicates) from each test-pit for gasoline range petroleum hydrocarbons (TPH-g), diesel and oil range petroleum hydrocarbons (TPH-d extended), benzene, toluene, ethylbenzene and xylenes (BTEX) compounds and kerosene;
- Analyze 2-3 of the most highly impacted soil samples for Carcinogenic Poly Aromatic Hydrocarbons (cPAHs), Resource Conservation and Recovery Act (RCRA) listed metals (including lead), Semi-Volatile Aromatic Compounds (SVOCs), Fraction Organic Carbon (FOC) and Total Petroleum Hydrocarbon (TPH) fractions by Volatile Petroleum Hydrocarbon (VPH) and Extractable Petroleum Hydrocarbon (EPH) analyses. Also analyze 2-3 soil samples for Methyl Tertiary Butyl Ether (MTBE), 1,2-Dibromoethane (EDB) and 1,2-Dichloroethane (EDC), naphthalene, n-hexane and for total petroleum hydrocarbon identification by (HCID) analysis;
- Analyze groundwater samples (plus blanks and duplicates) from each test-pit where groundwater is encountered for TPH-g, TPH-d ext and BTEX compounds and kerosene;
- Analyze 2-3 groundwater samples from the most highly impacted test-pit locations for SVOCs, cPAHs, RCRA metals (including lead), TPH fractions by VPH and EPH, MTBE, EDB, EDC, naphthalene, n-hexane and identify hydrocarbons by HCID analysis.

5.0 PROCEDURES

5.1 Underground Utility Locating and Test-Pit Clearing

Prior to pavement removal and trenching activities, Delta will arrange for the location of underground utilities by 1) contacting the Utilities Underground Location Center 2) contacting the City of Ellensburg Department of Public Works to assist in identifying buried utilities and 3)

contracting with a private locating contractor to identify, locate, and mark utilities in the areas to be sampled. It is especially important that location of sub-surface utilities beneath 15th Street be clearly and correctly marked in the event that the test-pits on the north side of 15th Street must be extended as trenches across the street towards the south.

Delta will also check the site to identify the types of paving or other structures that might be present. Where pavement or concrete are present in the areas to be sampled, a pavement or concrete cutting contractor will perform that work prior to excavation.

5.2 Obtain Permits

Because some of the work proposed will be performed in the City of Ellensburg's public ROWs (i.e. 15th Street and Water Street), Delta will contact the City of Ellensburg Engineering Office to obtain a public works permit and provide the city with a traffic control plan if applicable.

5.3 Test-Pit Excavation

A total of 20 test-pits (fifteen of which will be located within the City ROWs) will be dug at various locations surrounding the Site. These proposed test-pit locations are shown on **Figure 4**. At each test-pit location, pavement or concrete, if present, will be cut (were required by the City of Ellensburg Public Works Department) to allow a clean excavation to be performed. Prior to excavation, surface cover will be removed, transported to the Site and placed in a common pile for later disposal in a municipal landfill as clean construction wastes. Once surface covering has been removed, each test-pit will be excavated. Delta anticipates that each test-pit will be approximately two-feet wide and 5-6-feet in length. A backhoe or trackhoe will be used to excavate each test-pit and the soil removed from each test-pit (spoils) will be placed directly into a waiting dump truck. Spoils will be transported to the former Chevron facility for storage while awaiting laboratory results. Once these spoils have been characterized, Delta will arrange for treatment and/or disposal.

Seven of the proposed test pits located on the north side of 15th Street may be extended southerly as trenches to the south side of 15th Street. The decision to extend these trenches will be based on one or more of the following: results from laboratory analysis, headspace vapor

screening results above 500 ppm, sheen testing (moderate to heavy sheen produced by soil samples) and visual indications of the presence of hydrocarbon impacts (obvious soil staining). In test pits where these conditions are encountered, a trench will be extended from the test pit towards the south to the point where clean soils based on headspace vapor screening (results below 100 ppm), sheen testing (no sheen produced by soil samples) and the absence of any visual indications of hydrocarbon impacts. Trenches will be extended to the south across 15th Street until either clean soil (as defined by the conditions specified above) is reached or until the trench is as close to the southern curb of 15th Street as allowed by the City of Ellensburg. Due to the presence of subsurface utilities beneath 15th Street, soils within two feet of any utility encountered will be hand excavated.

5.4 Soil Sampling

Soil samples from each test-pit will be collected at three depth intervals (0-2 feet bg, 2-4 feet bg and below 4 feet bg from the capillary fringe directly above the static groundwater depth). Soil samples from each or these intervals will be collected from the bucket of the backhoe. At each sampled depth, a minimum of six-inches of soil will be removed from the upper surface in the backhoe bucket. Soil samples from beneath the upper six-inches will be placed in a re-sealable plastic bag for headspace vapor screening and sheen testing, and in glass sample jars for possible laboratory analysis. Each glass sample jar will be tightly packed with soil sample to prevent loss of volatile compounds. New nitrile gloves will be worn and pre-cleaned sample handling instruments (i.e. spoons, scoops etc.) used while transferring soil to sample jars. Each sample jar will then be sealed with a telfon-lined lid and labeled as outlined on the project Sampling and Analysis Plan (SAP) with a unique identification number, time and date of sample collection and the name of the person who collected the sample. Sample jars will be placed in a pre-cooled ice chest with wet ice and will remain in the custody of the sampler until the completion of sampling activities.

Delta's onsite geologist will classify the soil in accordance with the Unified Soil Classification System ("USCS") Visual-Manual Procedure (American Society for Testing and Materials Method D2488).

Headspace vapor screening and sheen testing will be performed on each soil sample collected using a separate container than the samples to be sent to the laboratory. Soil samples from

each sampled interval will be submitted for laboratory analysis. Additional soil samples will be selected for analysis based on headspace screening concentrations, sheen testing and visual evidence of petroleum impacts. In general, soil samples from 3-4 test-pits containing the greatest headspace vapor concentration and/or sheen production will be submitted for additional laboratory analysis. The onsite geologist will decide if any additional samples will be analyzed based on the results of the headspace vapor screening, sheen testing and visual indications of petroleum impacts.

At the completion of sampling activities, a sample chain-of-custody form will be completed and placed in a sealable plastic bag, which will then be affixed to the underside of the sample cooler lid. Soil samples will be packed in shipping materials designed to prevent damage to the sample containers. The cooler will be filled with wet-ice contained in doubled plastic bags, the cooler lid will be closed and secured with shipping tape and a custody seal placed across the cooler/lid interface. Soil samples will be hand delivered or shipped via overnight airfreight courier to Northcreek Analytical Laboratories in Bothel, Washington for analysis.

5.5 Soil Screening

Each of the soil samples collected will be screened in the field using a portable gas analyzer equipped with a photoionization detector ("PID") for the presence of volatile hydrocarbon vapors and of immiscible hydrocarbons as indicated by sheen production on the surface of distilled water.

Headspace vapor screening consists of measuring the vapor content of a volume of air in the headspace surrounding a sealed sample of soil. The screening procedure involves first placing the soils in a zip-lock bag, leaving a small amount of open headspace in the bag for organic vapors (if present) to collect. The bag is then sealed and the headspace allowed to equilibrate with the soil sample for a few minutes at ambient air temperature prior to PID measurement. The bag is partially opened, the PID intake probe is inserted through opening into the headspace, and the concentration of organic vapor in the headspace of the bag measured and recorded.

Sheen testing involves placing a small volume of soil in a "Dixie cup" to which an equal volume of distilled water is added. The sampler then notes the presence of sheen on the water surface

within the cup. A qualitative estimate regarding the intensity of the sheen produced is then recorded in the field log i.e. light, moderate or heavy sheen.

5.6 Groundwater Sampling

Following soil sample collection, and if greater than six-inches of groundwater has accumulated on the bottom of the test-pit, an attempt will be made to collect a sample of this water for petroleum hydrocarbons analysis. Groundwater will be collected using a length of disposable polyethylene (poly) tubing connected to a short length of peristaltic pump tubing on the suction side of a peristaltic pump. The poly tubing will be lowered into the excavation from the surface so that the end of the tubing is suspended in the water filled portion of the excavation but away from the bottom or sidewalls. Alternatively, the poly tubing will be placed inside a length of PVC pipe, which has been pre-cleaned with alconox and rinsed with distilled water. If neither of these two techniques is successful, or sample collection cannot be performed safely, then no further attempts will be made to collect a groundwater samples and the test-pit will be back-filled. Under no circumstances will any person enter the excavation to collect a groundwater sample. If groundwater can be obtained by pump, then a minimum of one-liter of groundwater will be drawn through the poly tubing and pump tubing prior to sample collection. While collecting samples, the flow rate of the peristaltic pump will be lowered to minimize pump surge, splashing and loss of volatiles. Groundwater samples for dissolved metals will be collected by attaching an inline 0.45-micron groundwater filter to the discharge side of the peristaltic pump. Approximately one-liter of groundwater will be pumped through the filter prior to sample collection in a poly bottle containing nitric acid as a preservative.

Groundwater samples collected for laboratory analysis will be collected in pre-labeled laboratory supplied sample containers appropriate for the analysis being performed and immediately placed in a pre-cooled ice chest for storage prior to transport to the analytical laboratory under chain of custody procedures. At the completion of sampling activities, a sample chain-of-custody form will be completed and placed in a sealable plastic bag, which will then be affixed to the underside of the sample cooler lid. Groundwater samples will be packed in shipping materials designed to prevent damage to the sample containers. The cooler will be filled with wet-ice contained in doubled plastic bags, the cooler lid will be closed and secured with shipping tape and a custody seal placed across the cooler/lid interface. Groundwater samples will be

shipped via overnight airfreight courier to Northcreek Analytical Laboratories in Bothel, Washington for analysis.

5.7 Test-Pit Back-Filling and Re-Surfacing

Once soil samples and groundwater samples have been obtained from each test-pit and/or trench, clean backfill material will be used to backfill each excavation. Each off-site excavation will be back-filled in 18-inch lifts and compacted between each lift to 95% Procter density or greater. Pea gravel or some similar self-compacting fill material will be used to backfill around any utilities encountered within the trenches extended across 15th Street towards the south. A minimum of six-inches of road-base gravel mix will complete each excavation located within a City ROW and be compacted as above. Excavations located on the Wondrack property will be backfilled and brought even in 18-inch lifts and compacted between each lift to 90% Procter density or greater. Each excavation within the 15th Street ROW will be re-surfaced by the City of Ellensburg during resurfacing activities currently scheduled to begin August 12, 2002. Test pits within the Water Street ROW will be re-surfaced with the same thickness of asphalt as was removed or at a minimum three inches of asphalt and seam sealed to the existing road surface by Delta's excavation contractor.

6.0 DATA QUALITY ASSURANCE

The following quality assurance and control procedures will be utilized during this investigation to ensure accurate and reproducible data reflective of true subsurface conditions.

6.1 Monitoring Equipment Calibration

The portable PID used for screening soil vapor head-space will be calibrated at the beginning of each day according to the manufactures recommended procedure using a laboratory certified isobutylene gas standard.

6.2 Decontamination Procedures

Equipment that is not directly used for sampling (i.e. backhoe and trackhoe buckets) will be cleaned between each sampling location using a high-pressure hot water wash. Soil sampling equipment (i.e. spoons and scoops) will cleaned by washing with non-phosphate detergent (e.g. Alconox, Liquinox) and water, rinsing with clean tap water, and rinsing with deionized or distilled

water. Water level indicators (if used) will be washed with detergent and water and then rinsed with deionized tap water or distilled water before use, between each sampling or measurement location and prior to storage.

Disposable nitrile gloves, bailers, sampling pump tubing, peristaltic pump tubing, PVC pipe lengths and any other form of disposable sampling equipment will be discarded after use at each sampling location and/or interval.

6.3 Sample Storage, Packing, and Shipment

All soil and groundwater samples will be stored in an ice chest while at the site and during transportation to the laboratory. Samples will be sub-packed by sample location in new zip-lock plastic bags and stored in the dark at 4° C. A temperature compliance vial will accompany each cooler to verify that proper holding temperatures were maintained during storage and transport. Additional information regarding sample storage, packing and shipment is documented in the project QAPP.

6.4 Chain of Custody Procedures

Chain of custody procedures are specified in the project QAPP. Each sample cooler containing laboratory samples will contain a fully completed chain of custody form. The field personnel will retain a copy of the COC and the original will be sent with the samples to the laboratory.

6.5 Sample Quality Assurance/ Quality Control Procedures

Quality assurance/quality control ("QA/QC") samples will be collected as specified in the QAPP and include field blanks, trip blanks and duplicate soil and groundwater samples. Field blanks, trip blanks and duplicate samples will be labeled with unique sample numbers. The laboratory will have no indication that a sample is duplicate or blank. A field blank and duplicate sample will be collected for each 10 soil and groundwater samples, and a trip blank will accompany each sample cooler containing soil or groundwater samples.

Quality assurance/quality control (QA/QC) samples are necessary to ensure the precision, accuracy, representativeness, completeness, and comparability of the data. Four types of QA/QC samples will be processed during sampling, three of which must be collected in the field:

a source blank, a field duplicate, and an equipment rinsate. The contracting laboratory supplies one additional QA/QC sample, the trip blank.

Source blanks are collected and analyzed to determine if contamination is being introduced into the sample by water used for decontamination. A minimum of one blank from each source of water used shall be collected and analyzed for the same parameters as the related samples for each round of sampling.

One duplicate sample for every 10 soil samples and every ten groundwater samples (10 percent) shall be collected and submitted to the laboratory for analysis. When fewer than 10 soil or groundwater samples are collected, at least one duplicate sample from each media sampled will be collected and submitted for analysis. The duplicate sample is designed to be identical to the original sample and submitted to gain precision information on the homogeneity of sampling, shipping, storage and preparation, and analysis. In general, the goal is to identify possible field variations. The duplicate sample will be collected at the same environmental location and shall be collected when the environmental sample is collected. Duplicate samples will be issued discrete sample identifiers to prevent the analytical laboratory from recognizing the sample as duplicate.

Equipment rinsates are the final analyte-free rinse water from equipment cleaning and are collected at the ratio of one per sampling event. The rinsate blanks will be analyzed to ensure that decontamination procedures are sufficient and that no cross-contamination has occurred. The results from the blanks will be used to flag or assess the concentration of the analytes detected. The rinsates are analyzed for the same parameters as the related samples.

Trip blanks are samples of analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the samples. The analytical laboratory provides the trip blanks. One trip blank shall accompany each cooler containing soil or groundwater samples.

The quality assurance objective for this project is to ensure that chemical and physical data of known and acceptable quality is produced. To achieve this objective, all samples will be

analyzed in accordance with EPA or equivalent protocols. An analytical laboratory certified and approved by the state of Washington will perform all analyses.

The quantitation limits and QC limits for soil and groundwater samples with respect to accuracy and precision will be consistent with updated EPA methods. Project quality assurance objectives are specified in the QAPP.

7.0 LABORATORY ANALYSES

Each soil and groundwater sample, and the QA/QC samples as required by the QAPP, will be submitted to Northcreek Analytical Laboratories in Bothel, Washington for analysis of gasoline range petroleum hydrocarbons, BTEX compounds, diesel/oil range petroleum hydrocarbons and kerosene.

Soil and groundwater samples will be analyzed using the following Washington State and EPA approved methods:

- Total petroleum hydrocarbons as gasoline by NWTPH-G*
- Total petroleum hydrocarbons as diesel and oil by NWTPH-D extended with Silica gel cleanup*
- Kerosene by EPA Method 8015 modified*
- BTEX compounds by EPA Method 8021b*
- Volatile total Petroleum Hydrocarbon fractions (VPH)
- Extractable total Petroleum Hydrocarbon fractions (EPH)
- Carcinogenic PAHs by EPA Method 8270c with Selective Ion Monitoring (SIM) analysis
- SVOCs by EPA Method 8270c
- RCRA metals using EPA series 6000/7000 methods
- MTBE by EPA Method 8260b
- EDB and EDC by EPA Method 8260b
- Naphthalene and n-Hexane by EPA Method 8260b
- Hydrocarbon Identification by NWTPH-HCID
- Fraction Organic Carbon (FOC) by ASTM Method D-2974

Note: * = Each soil and groundwater sample collected will be submitted for these analyses

- One sample from each sampled interval from each test-pit will be analyzed for TPH-G, TPH-D extended, kerosene and BTEX compounds.
- Soil samples from each of the three sampled intervals will be collected from 2-3 of the test-pit locations for each of the additional analyses listed above.

Groundwater samples will be selected for analysis based on the following criteria.

- One groundwater sample from each test-pit where groundwater infiltration results in greater than six-inches of standing water within the test-pit during the excavation period will be analyzed for TPH-G, TPH-D extended, kerosene and BTEX compounds.
- Additional groundwater samples will be collected from 3-4 of the test-pit locations for each of the additional analyses listed above.

8.0 STORAGE AND DISPOSAL OF RESIDUALS

Residual soil from this investigation will be transported to the Site and stockpiled on a 10-mil thick visqueen liner and covered with visqueen while awaiting laboratory results. Following receipt of laboratory analytical data, Delta will arrange for treatment and disposal of all sampling residuals.

All decontamination and purge water will be stored in 55-gallon DOT approved waste drums. These drums will be temporarily stored on the former Chevron facility to allow suspended solids and fines to settle (usually 2-3 days), at which time this water will be treated on-site by activated carbon filtration and then discharged to the surface.

9.0 DRAFT RI/FS REPORT PREPARATION

After the laboratory analysis reports have been received, a draft RI/FS report will be prepared in compliance with the reporting requirements of WAC 173-340-350 through 370. The draft RI/FS will include:

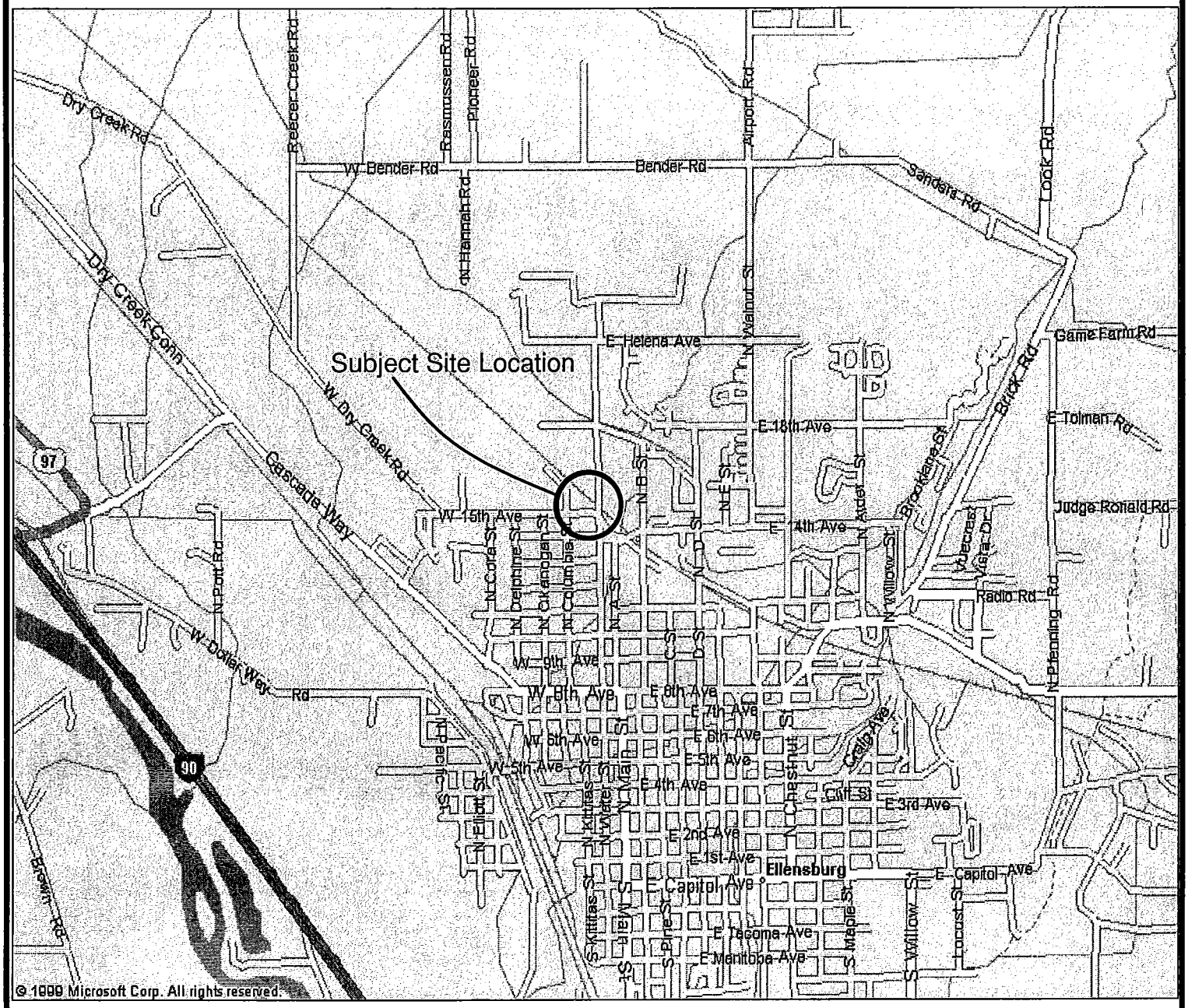
- A brief description of the work performed;
- Tables of laboratory analytical results;
- Laboratory analysis reports and chain of custody forms;
- A site conditions map depicting actual sampling locations with well numbers and test-pit designations;
- A discussion of the vertical and lateral extent of petroleum hydrocarbon impacts in soil and water from the site;
- Analysis of potential cleanup actions for this site;
- A quantitative risk assessment for these cleanup actions;
- A detailed description of the preferred cleanup action; and
- A schedule for the implementation of the preferred cleanup action.

Following approval of this draft RI/FS report, Delta will incorporate both public and Ecology comments and issue a Final RI/FS report.

10.0 SCHEDULE

Delta will schedule fieldwork following written approval of this work plan by Ecology. The anticipated schedule for implementation of this investigation is as follows:

1) Contracting and scheduling of excavation contractor – 2 weeks
2) Underground utilities marking – 1 day
3) Soil and groundwater sample collection – 5 days
4) Laboratory analysis – 3 weeks for the complete data report however, data from some of the soil samples collected will be available prior to the completion of field activities.
5) Draft RI/FS report will be submitted to WDOE within 60 days following completion of fieldwork.



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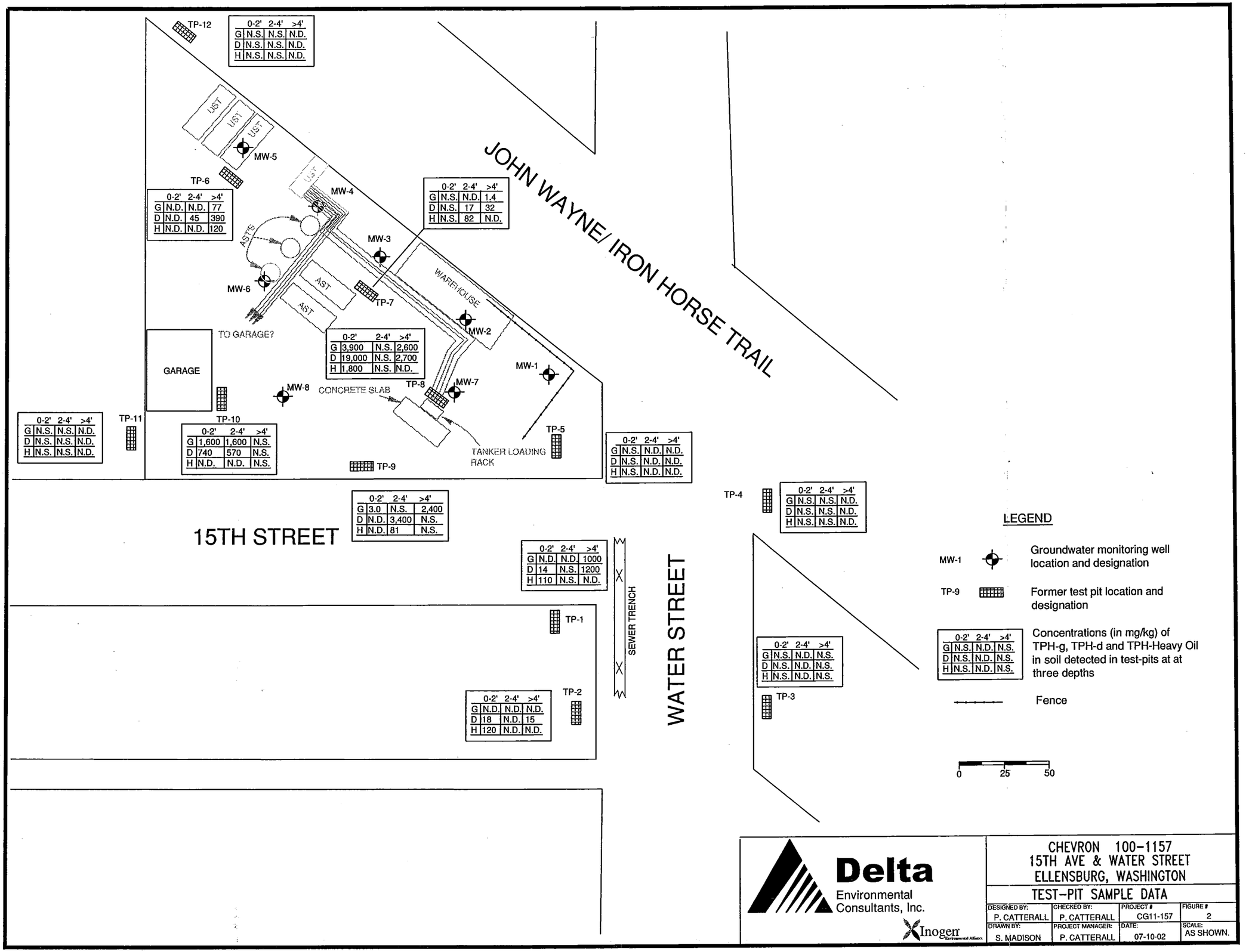
CHEVRON 100-1157
15TH AVE & WATER STREET
ELLENSBURG, WASHINGTON

SITE LOCATION MAP

DESIGNED BY:	CHECKED BY:	PROJECT #	FIGURE #
P. CATTERALL	P. CATTERALL	CG11-157	1
DRAWN BY:	PROJECT MANAGER:	DATE:	SCALE:
S. MADISON	P. CATTERALL	07-10-02	AS SHOWN.



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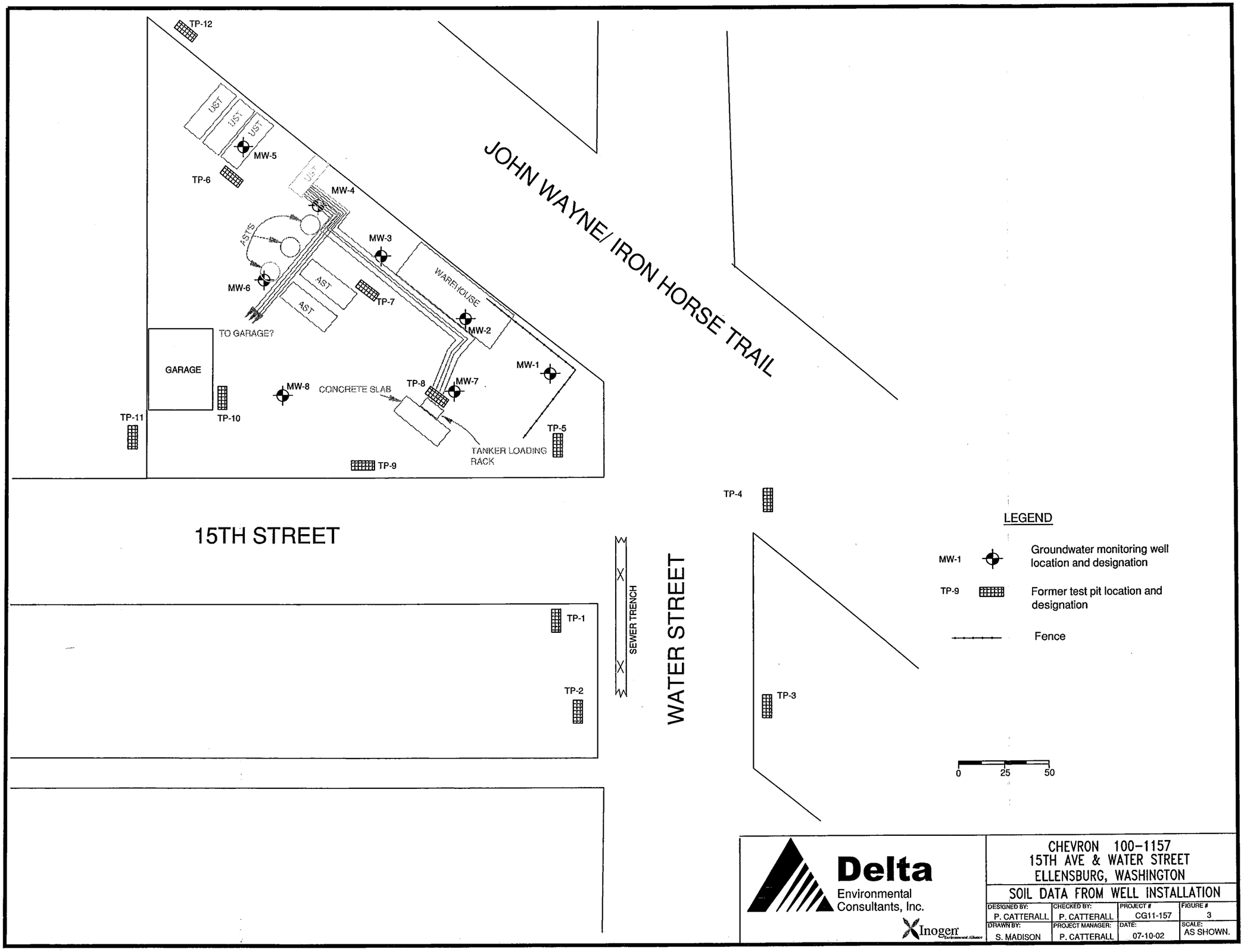
TEST-PIT SAMPLE DATA

DESIGNED BY:	CHECKED BY:	PROJECT #	FIGURE #
P. CATTERALL	P. CATTERALL	CG11-157	2
DRAWN BY:	PROJECT MANAGER:	DATE:	SCALE:
S. MADISON	P. CATTERALL	07-10-02	AS SHOWN.



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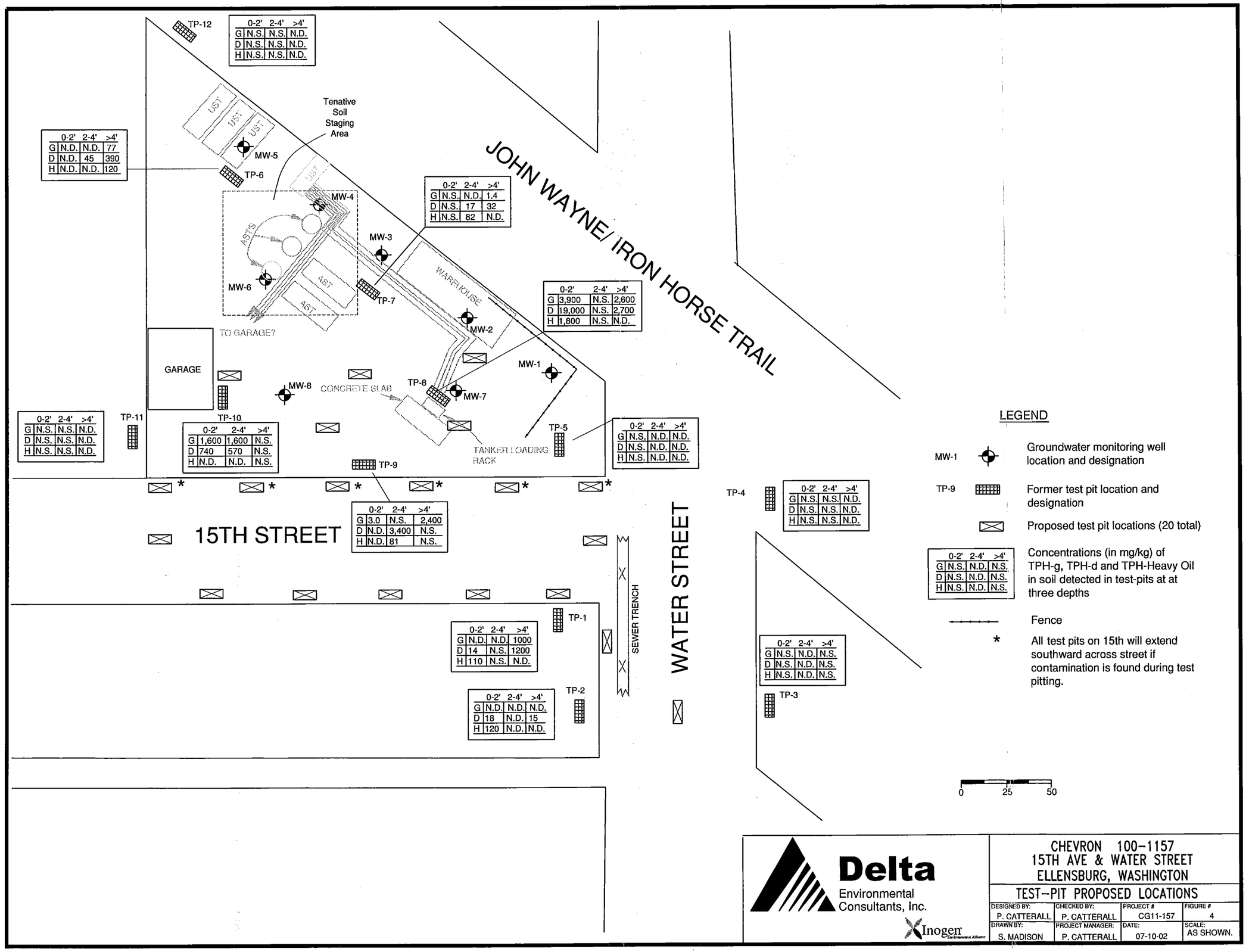
SOIL DATA FROM WELL INSTALLATION

DESIGNED BY:	CHECKED BY:	PROJECT #	FIGURE #
P. CATTERALL	P. CATTERALL	CG11-157	3
DRAWN BY:	PROJECT MANAGER:	DATE:	SCALE:
S. MADISON	P. CATTERALL	07-10-02	AS SHOWN.



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TEST-PIT PROPOSED LOCATIONS

DESIGNED BY:	CHECKED BY:	PROJECT #	FIGURE #
P. CATTERALL	P. CATTERALL	CG11-157	4
DRAWN BY:	PROJECT MANAGER:	DATE:	SCALE:
S. MADISON	P. CATTERALL	07-10-02	AS SHOWN.