Work Plan

Work Copy

Mercury Meter Site Investigation/Remediation Farmington, New Mexico

Prepared for

El Paso Natural Gas Company
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MERCURY METER SITE
INVESTIGATION/REMEDIATION
WORK PLAN

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

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El Paso Natural Gas Co. (EPNG) operations are divided into two regions, North and South. The North region consists of Farmington and Albuquerque Divisions and include operations in Texas, New Mexico, Oklahoma, Arizona, Utah and Colorado. The South Region consists of the Midland and El Paso Divisions and include operations in Texas, New Mexico, Arizona and California. The majority of the Farmington Division operations are located in the San Juan Basin and there are approximately 10,000 well sites over a 32,000 sq. mi. area. In late 1987, EPNG became aware of the potential mercury contamination in the soil at their flow meter sites within their operations.

EPNG recognized the need to determine the magnitude of mercury contamination and hired a consulting firm to investigate. John Mathes & Associates, Inc. (JMAI) of Pittsburgh, PA., concluded that 86% to 88% of all the sites which have or had mercury meter stations (8700) in the Farmington Division were potentially contaminated. EPNG was concerned for its' employees health and exposure to mercury and developed "The Mercury Protocol". The Mercury Protocol document addressed the procedures for mercury handling, vehicle decontamination and meter house cleanup. EPNG has conducted the cleanup of approximately 340 mercury contaminated metering facilities as of February 1990, in the Farmington Division. EPNG met with the Oil Conservation Division (OCD) of New Mexico in November of 1989 to discuss their experience, findings and proposed a basic program to address the past and future use of

the mercury flow meters and the potential soil contamination and discuss their intent to expand the mercury site remediation program.

The cleanup will be conducted by EPNG personnel assisted by contract labor. The Quality Assurance Project Plan (QAPP), the Work Plan and the Field Sampling Plan (FSP) developed by Woodward-Clyde Consultants (WCC) will be implemented by EPNG personnel. Oversight Quality Assurance/Quality Control (QA/QC) for mercury remediation will be provided by WCC. This program will be extended outside the Farmington Division once experience has been gained and revisions to the protocol, if any, are complete.

1.2 STATISTICAL REPORT

In January of 1989, JMAI was contracted by EPNG to determine the number of mercury meter stations with potential health hazards due to mercury contaminated soil. Based on a binomial distribution it was estimated that 68 out of 8700 sites would determine within a 90% accuracy, the number of potential mercury contaminated sites. To eliminate unknown sources of bias in the selection process and obtain a representative sampling of the sites to be tested, the sites were selected randomly. JMAI commenced field sampling and analysis of 68 randomly selected sites in the Farmington Division in New Mexico in late January of 1989. Field testing was completed in early February of 1989 and a report issued on March 27, 1989. The report, titled "Pipeline Metering Station, Mercury Assessment Report", concluded that between 7,312 and 7,438 out of 8700 (86%-88%) sites in New Mexico, Arizona, Utah and Colorado had a potential mercury contamination problem.

The presence of Mercury contamination within the meter hut was defined using 3 different criteria. The first criteria was based on EP TOX mercury concentration results of the underlying soil equal to or greater than 0.2 mg/l representing an environmental hazard considered to be a characteristic waste to be disposed of as a hazardous waste. The second criteria concentrated on the visual location of free mercury within the meter hut and/or beneath the meter station after the soil was stirred. The third criteria was based on measuring mercury vapor concentrations greater than 0.05 mg/m3.

Of particular interest in the report, JMAI studied the relationship between each type of EP TOX, total mercury, and mercury vapor measurements. The study could not demonstrate the relationship between the results of the various types of measurements.

1.3 PROJECT OBJECTIVE AND SCOPE OF WORK

The primary objectives of the Mercury Meter Site Investigation /Remediation program are to:

* Maintain the Health and Safety environment for EPNG personnel

* Maintain the metering station site environmental conditions

* Reconstruct the meter house to reduce the release of mercury into the environment

These objectives will be accomplished by the following site activities:

* Screening the air within the meter house for the presence of combustible gases and mercury vapors

* Visually inspecting for indications of mercury contamination

* Removing the meter house

* Excavating the soil suspected to be contaminated with mercury

* Verification sampling of the soil after soil removal

* Reconstructing the meter house with a device to catch and contain mercury

EPNG's objective is to review and improve existing investigation/ remediation procedures. EPNG is concerned over the workers' safety, health risk and had oriented the mercury protocol toward workers' safety. There are presently three criteria which define mercury soil contamination. These 3 criteria include:

1. Visible mercury

2. Presence of mercury vapors equal to or greater than 0.05 mg/m3

3. Mercury content found in the soil in excess of 0.2 mg/l by the Toxicity Characteristic Leaching Procedure (TCLP).

If either criteria #1 and #2 indicated a positive reading, the soil remediation program is initiated. Soil sampling had been used solely for verification purposes at remediation sites. If the criteria #1 and #2 are negative and show no signs of mercury then the verification sample is taken, no soil is removed and the meter house is reconstructed.

1.4 PAST REMEDIATION EXPERIENCE

In response to the inquiries of well site operators concerning visible mercury contamination at the mercury meter stations, EPNG initiated a cleanup program in the Farmington Division. In March of 1989 EPNG crews followed remediation guidelines as set forth in the Mercury Protocol developed by an EPNG Task Force. Approximately 340 mercury meter sites have been remediated in the Farmington area.

2.0 SITE BACKGROUND AND SETTING

2.1 FARMINGTON DESCRIPTION

The EPNG Farmington Division operates over 10,000 well site meters in the San Juan Basin covering an area of approximately 32,000 sq. mi. in size. It is divided into three operating areas which contain the following field districts: Angel Peak, Kutz, Ballard, Blanco, Lowry, Lindrith and Ojito. The Field Districts are subdivided into runs which may consist of 50 to 70 well sites each. The well sites are located on private, federal, national forest and Indian property. Typically, the meter stations are located on bare property approximately 1/2 to 1 acre in size. The surrounding terrain varies from arid desert, mountain forest to river valleys. A systems map displaying the Farmington Division and its' operating areas are shown in Figure 1.

Although their primary concern is for the worker's health and safety, a secondary concern which EPNG has considered is for the protection of the environment. The Farmington Division has prioritized certain areas of the San Juan Basin for Phase 1 of the investigation/remediation program. The areas to be given priority will be the metering stations with mercury meters and those which had mercury meters, located in the state of New Mexico, Energy and Minerals Department Oil Conservation Division (OCD) designated sensitive water zones.

2.2 FACILITY DESCRIPTION

The metering stations in the Farmington Division are typically very similar. An overall site plan of a well site is presented in Figure 2 and details of the mercury flow meter station are

illustrated in Figure 3. The well sites and mercury flow meter stations are described in the following paragraphs.

2.2.1 WELL SITE

A typical well site consists of the valves (x-mas tree), a production unit to separate oil & gas, associated tanks, a dehydration unit, pit, and the connection to the distribution line (dogleg). The metering station is usually located near the well valve system. The line connection to the distribution system (dogleg) is typically located at the nearest lateral or well tie line, which may vary significantly in distance.

2.2.2 METER STATION

The detailed description of a metering station is best described with the use of Figure 3. The number in parenthesis (No.) in the discussion below identifies a particular element of the metering station as shown on Figure 3. A standard metering station in the Farmington Division consist of a sheet metal house (30) mounted on a 6' x 4' wooden skid (31) with a dirt floor. This building is ventilated with several small screened openings on the sides near the roof. The building has two entrances on either side, one of which can be opened from the outside and the other from the inside. Full access can be obtained to the meter by removing the safety latch from the exterior of one of the doors, entering and releasing the safety latch of the other door from the inside. The doors have a safety bar at the top to maintain the doors in the open position while maintenance operations are in progress.

The mercury flow meter consists of a static and differential pressure recorder (35) with a manifold (32,27,33) connected to the meter run flange (24,26). A U-tube is located at the rear of the flow meter which is secured by a stand (34) and saddle (36). The meter may contain from 7 lbs to 12 lbs of mercury. The meter run connects the well to EPNGs' gathering system and has an in-line flange (24,26) housing an orifice plate (22,29).

A temperature recorder (37) is sometimes part of the meter station. It can be located off to one side of the meter hut or in-line and adjacent to the mercury meter. The temperature recorder contains a small amount of mercury (2 oz.) in an armored capillary tube (38).

2.3 MERCURY METERS

Meters are placed at all well sites to measure the amount of gas purchased and/or transported through EPNG's pipeline system. The basic function of a meter station is to record the static pressures and differential pressures on a circular chart. The static pressure is provided from in-line measurements and the differential pressures are measured at the orifice flange. The run technicians are required to visit the individual metering stations on a frequency at least equal to the chart measuring capacity (8, 16, 31 days). The run technicians typically calibrate the meter quarterly and inspect the orifice plates yearly. Other duties of the run technician include editing circular charts, cleaning, changing chart drive batteries and inking pens.

There are various reasons for mercury spillage within the metering stations and a few are listed as follows:

Maintenance

Some droplets of mercury escape while routine maintenance is performed on the meter or when a routine check is made on the orifice plate (Mercury which has collected at the orifice plate and flange is released when the plate is removed for inspection).

Leaks

Mercury can also be spilled as a result of leaks due to aging seals and gaskets, or as a result of high line pressures.

Pressure

The most common cause of spills is attributed to severe fluctuations in pressures from the well. Many wells periodically are turned off (shut-in) to build pressure. The meter check valves, in some instances, are unable to absorb the sudden pressure surge causing carry-over into the meter run when the well is reactivated. The meter U-tube fitting and gasket may also fail when the well is reactivated.

Typical elements which may leak due to high line pressures are:

* U-TUBE
  The U-Tube is a metal tube located behind the metering box. The sources of mercury spillage are identified as the failure of the tubing itself and/or at the mechanical

connection points. The capture of possible mercury spillage is addressed in the work plan.

* PIN REGISTER
The pin register located in the small metal metering box is a source for very small leaks caused by high pressures during start-up. The small mercury spillage is somewhat contained by virtue of the metering box casing and door. The leakage of mercury is addressed in this work plan.

Vandalism

Vandalism of the metering equipment can occur.

3.0 INITIAL EVALUATION

EPNG has completed Meter Site Investigation/Remediation work on over 300 mercury meter stations in the San Juan Basin since March of 1987. The field crews have typically removed a 2 to 4 inch lift of soil from the meter house floor. In certain concentrated areas the crews have had to excavate up to four feet in depth. The amount of mercury contaminated soil typically removed from the sites is approximately 500 lbs. or one 55 gal. drum. The information collected by EPNG has been specific to each meter house and includes:

* Well Name
* Meter Number
* Date Cleaned and/or Sampled
* EP TOX Mercury Levels
* Vapor Readings in mg/m3 (floor & head level readings)
* Temperatures
* Date Dry Flow Meter Installed (if applicable)
* Date Liner Installed

4.0 WORK PLAN RATIONALE

The primary objectives of the Mercury Meter Investigation /Remediation project are:

* Maintain the health and safety conditions for EPNG production personnel working within a mercury flow meter station

* Remove the visible mercury and mercury contaminated soils greater than a 0.2 mg/l Toxicity Characteristic Leaching Procedure (TCLP) action level from EPNG metering stations that contain, or in the past have contained, a mercury flow meter

* Reconstruct the meter station with a mercury containment device (fiberglass pan) where needed to reduce the release of uncontained mercury into the environment

This work plan is designed to provide the basis for accomplishing these objectives. The work plan rationale (basic framework) consists of two basic elements:

* Data Quality Objectives (the qualitative and quantitative requirements of the data)

* Work Plan Approach (how the data will be obtained to meet the Data Quality Objectives)

4.1 DATA QUALITY OBJECTIVES

The Data Quality Objectives (DQO) are centered on the possible contamination and the sources of contamination. The general work plan data objectives are as follows:

* The data shall be obtained in a manner consistent with this Work Plan, the Field Sampling Plan (FSP), and the Quality Assurance Project Plan (QAPP).

* The data will meet analytical quality assurance objectives such that it is suitable for the evaluations to be performed after data collection.

The proposed analytical methods presented in this plan have been reviewed to verify that they will provide detection limits that are adequate for data evaluation. The analytical quality objectives are addressed in the QAPP.

4.1.1 COMBUSTIBLE VAPOR INDICATOR DATA OBJECTIVE

The crew will initiate a hot work permit (Figure 4) in accordance with EPNG's safety policy and procedures. The primary purpose of determining the existence of combustible vapors is to be able to utilize non-explosive equipment. The equipment to be utilized in the determination of combustible vapors is an MSA EXPLOSIMETER Combustible Gas Indicator Type Model 2A or an approved (by the Health and Safety Officer) equivalent.

4.1.2 VAPOR MEASUREMENT DATA OBJECTIVE

The primary purpose of collecting vapor measurements at head and ground levels is to aid in determining the potential for human inhalation or dermal absorption. Vapor readings at the meter box will be taken at a height of 5 feet from the ground within 18" from the meter. The head level sampling point is approximately 6 inches above the meter box $\pm$ 1 inch, and the ground level sampling point is 2 inches above the ground $\pm$ 1 inch. The secondary purpose for the vapor measurements is to locate the presence of mercury vapors and to determine if further excavation is required.

4.1.3 TEMPERATURE DATA OBJECTIVE

The primary purpose of the temperature reading is for comparison and understanding of the mercury vapor readings. The characteristics of mercury are temperature dependent and as such, any measurements with mercury vapor requires that temperatures be recorded $\pm$ 2 degree F.

4.1.4 VERIFICATION SAMPLING DATA OBJECTIVE

The primary purpose of the verification sample is to assure that the mercury levels are below the action level of 0.2 mg/l. This information will ultimately determine the need to continue the remediation. The results of the sampling data are expected within 10 days from the day that the laboratory receives the sample. The accuracy and precision of the verification samples are indicated in section 3 of the QAPP. Should the verification sample results exceed the action level objective, the crew will return to the appropriate metering station to continue contaminated soil excavation.

4.1.5 FILL MATERIAL SOIL SAMPLING DATA OBJECTIVE

The primary purpose of the fill material sample is to assure that the material designated for use to replace the soil removed at each of the metering stations does not contain mercury levels above 0.2 mg/l based on TCLP testing procedures. The source material will be sampled and analyzed using similar analytical testing procedures prescribed for the verification samples. The number of discrete source material samples shall be determined by the Laboratory Coordinator and sampled by a designated Field Specialist. Source (fill) material for the metering stations, if practical, should be taken from one location throughout the project duration. The Laboratory Coordinator will determine the number of samples to be taken at each site should other source locations be required.

4.2 WORK PLAN APPROACH

The work plan approach consists of the data collection program needed to meet the data quality objectives described in Section 4.1. The work plan approach consists of the following phases:

* Phase 1 - Site Preparation
* Phase 2 - Preliminary Investigation/Remediation
* Phase 3 - Remediation
* Phase 4 - Verification Sampling
* Phase 5 - Meter House Installation

The following paragraphs generally describe each of these phases. Section 5 presents a detailed description of the phases.

4.2.1 SITE PREPARATION

The site preparation activities will generally consist of the Field Specialist inspecting the work area, defining an area for the temporary storage of the meter house and defining the boundaries for an exclusion zone, controlled area and a support zone.

4.2.2 PRELIMINARY INVESTIGATION/REMEDIATION

The preliminary Investigation/Remediation activities are to mitigate additional soil contamination by removing any visible mercury from the meter house prior to its' removal. Prior to commencing any work, the presence of combustible gas is checked for vapor readings and are taken to assure a safe working environment.

4.2.3 REMEDIATION

This phase represents screening for mercury, actual contaminated soil removal, and intermediate vapor reading measurements.

4.2.4 VERIFICATION SAMPLING

This phase represents the sampling, sample handling and describes the chain of custody form (COC). A detailed Field Sampling Plan (FSP) provides guidance for all fieldwork by defining in detail the sampling and data gathering methods to be used on this project and is presented in Appendix A.

4.2.5 METER HOUSE INSTALLATION

The meter house installation provides for placing backfill material, replacing and or reconstructing the meter house and installing the permanent mercury containment device after the verification sampling.

5.0 SITE REMEDIATION

5.1 SITE CHARACTERISTICS

The EPNG metering stations in both the North and South Regions are different. Variations exist in a meter house configuration, several of which are identified below:

* Meter station with or without a meter house
* Meter house with a soil, concrete or asphalt floor
* Meter station with a mercury meter, dry flow meter (contains no mercury) or a station with a dry flowmeter which has replaced a mercury meter

The metering stations in the Farmington Division (North Region) in the San Juan Basin have very few variations in a meter house configuration. A typical Farmington Division meter station will have a meter house with a soil floor and a mercury meter in operation. This work plan addresses the typical configuration of a meter house and a few variations such as a meter station w/o a meter house and a station with a dry flow meter which has replaced a mercury meter.

5.2 SITE INVESTIGATION/REMEDIATION

5.2.1 SITE PREPARATION

It is the responsibility of the Field Specialist to assure a safe area to work in and to establish an exclusion zone, controlled area and a support zone around the mercury meter house.

5.2.1a AREA INSPECTION

The Field Specialist shall inspect the working area in the immediate vicinity of the meter station. It is the Field Specialist's responsibility to define a working area for the work crew and an area for the temporary storage of the meter house.

5.2.1b TEMPORARY LOCATION FOR THE METER HOUSE

The Field Specialist will determine a location for the temporary storage of the meter house. The meter house, not to be removed at this time, should be placed in a space away from the remediation area. The storage area should be accessible by mobile crane and set a safe distance away from the well head, valving, tanks and pipe systems.

5.2.1c SAFETY ZONES

The Field Specialist will define three work zones around the mercury meter site (refer to Figure 1 of the H & S plan), specifically: The Exclusion Zone, the Contamination Reduction Zone, and the Support Zone as described in 7.2.7 of the Health and Safety Plan. The Field Specialist will first define an Exclusion area and place traffic cones at each corner of the meter house or meter house skid. A Contamination Reduction Zone delineated by traffic cones and a yellow "caution" tape barrier suspended by wooden lathes which is an additional 5' from the exclusion zone is also to be established immediately outside of the Exclusion Zone for decontamination purposes as discussed in 7.2.7 and 9.2 of the H & S plan. The Support Zone is located in a clean area and described in section 7.2.7, typically vehicles are located in a Support Zone. The Field Specialist will assist the run technician in establishing the area control zone.

5.2.2 PRELIMINARY INVESTIGATION/REMEDIATION

The intent of the preliminary Investigation/Remediation is to inspect the meter house and the floor area for visible/recoverable mercury and to remove it prior to lifting the meter house. The meter house will be placed outside of the exclusion zone in a secured area as defined in 5.2.1.b after any visible mercury has been removed. The meter house removal is addressed in 5.2.3.

5.2.2a PREPARATION

Prior to entering the meter house the Field Specialist will assure that all qualified personnel are fitted with personal protective equipment (hard hat, safety glasses, Tyvek coveralls, rubber-soled shoes, rubber gloves, respirator, etc.,) as defined in the Health and Safety Plan.

5.2.2b VAPOR MEASUREMENT

The purpose of tasks (i), (ii) & (iii) is to meet the objectives described in 4.1.1 (Combustible Vapor Indicator Data Objective), 4.1.2 (Temperature Data Objective) and 4.1.3 (Vapor Measurement Data Objective) respectively. If a meter house is present, open both meter house doors and initiate documentation using the EPNG Meter Site Data Form (MSDF). All subsequent information at this site will be entered on this form, Figure 5.

(i) A Gas Scope, or equivalent atmospheric analyzer, will be utilized per EPNG's Safety/Policy and Procedures.

(ii) Record the ambient temperature on the Meter Site Data Form using calibrated thermometers,

at the meter level. The thermometer calibration should be made and compared with an NBS Certified Standard Thermometer as described in the QAPP. Care should be taken to insure that the thermometer stem does not come in contact with the meter or any metal objects.

(iii) Using either a Bacharach MV-2, Jerome 411, or equivalent mercury vapor analyzer, record the vapor readings at two points within the designated cleanup area. Take a measurement at head level and record the data on a MSDF as head level reading. Next, take a measurement at ground level and record this data as a floor level reading.

5.2.2c VISIBLE/RECOVERABLE MERCURY

The Field Specialist (or qualified designee) shall enter the meter house and visually inspect the walls, heater, piping, and floor area for signs of visible mercury. Particular attention should be given to any visible mercury on the floor which may be dislodged once the meter house is lifted.

The Field Specialist (or qualified designee) will also make a note as to where he observed the visible mercury and record this information on the second page of the MSDF.

5.2.2d LIMITED MERCURY REMOVAL

The purpose of limited mercury removal at this time is to remove any visible mercury which may be dislodged once

the meter house is lifted. Using a mercury vacuum cleaner, aspirator or plastic spoon, remove any large drops of mercury found on the floor or soil surface which has the potential to be released beyond the existing meter house boundary. The perimeter flange bottom of the meter house should be broken and the mercury removed if the mercury vapor analyzer indicates the presence of mercury. The mercury, if present, should be collected in a properly labeled, company approved mercury bottle for later cleaning and storage or reuse. Recovered mercury must be transported in accordance with the EPNG Safety Policy and Procedure Manual and applicable DOT regulations.

5.2.3 METER HOUSE REMOVAL

The removal of the metal house will be in accordance with the EPNG Job Safety Analysis (JSA) found in Appendix B.

5.2.4 REMEDIATION

The Field Specialist is directly responsible for all operations at the meter site. The Field Specialist will assure that Health and Safety (H&S) precautions are taken and H&S procedures are followed.

5.2.4a PREPARATION

The Field Specialist shall assure that proper equipment is available at the site prior to commencing the remediation project. An EPNG checklist is provided in the field activity Job Safety Analysis found in Appendix B.

5.2.4b SCREENING FOR MERCURY

To estimate the depth of contamination a trowel or shovel should be used to investigate the soil under the meter and/or orifice plate or any other area suspect of mercury contamination to a depth of 6" to 8". Screening is further described 5.2.4.d.

Vapor measurements similar to the procedure described in the previous section of 5.2.2b (iii) should also be taken to assist in defining the extent of mercury contamination.

5.2.4c MERCURY/SOIL REMOVAL

(i) Recoverable mercury discovered after the house has been removed should be collected when found. The purpose is to prevent the mercury from traveling downward, causing the excavation to extend further in depth than necessary. An aspirator bulb, plastic spoon, or syringe should be used to collect the mercury. Mercury found and recovered during the excavation process should be placed in a properly labeled, approved mercury bottle for transport to a designated site for cleaning. Recovered mercury must be transported in accordance with the EPNGs' Safety Policy and Procedure Manual.

(ii) The floor area is to be excavated until such time as no visible mercury is present, soil is typically excavated in two (2) inch lifts.

Excavation should concentrate on specific areas of contamination. In all cases, excavation must extend to a depth and area necessary to remove contaminated

soil as determined by observation and the screening measurements. Verification of sufficient soil removal may include mercury vapor measurements.

(iii) Miscellaneous solid materials such as concrete, metal and wood are to be removed and placed in separate containers from excavated soil and the container should be labeled as containing concrete/wood/metal. The container will be secured properly to prevent any vapors or materials from escaping.

5.2.4d FINAL SITE SCREENING

Upon completion of the excavation to a point where no further signs of mercury, as defined in 5.2.4b can be observed; close examination of the excavated area by probing with the trowel will determine if the mercury has been removed. (Note: Vapor levels are usually elevated during excavation, and higher readings are not necessarily indicative of additional mercury present. A more accurate vapor level can be attained by waiting 15 to 30 minutes after excavation has ceased allowing airborne particles to dissipate).

5.2.4e U-TUBE BAG

For metering stations with mercury meters, the U-Tube should be inserted into a large 1 qt. or larger, plastic bag such that the U-tube fits inside it. Strapping and duct tape should be used to secure the bag in place.

5.2.5 VERIFICATION SAMPLING

Upon the satisfactory removal of mercury contaminated soil within the acceptable limits as provided in the mercury screening section, the verification sample can then be taken. The guidelines established for the verification sample are described in Section 2.5.4.

5.2.5a SAMPLING

The Field Specialist will take a verification sample at a pre-determined location within the investigation/remediation area,as established in Section 4.1.2, GRID SAMPLING, of the QAPP. The Field Specialist has the authority to take additional samples at his/her discretion. The discrete samples are taken and packaged individually in EPNG approved sampling containers supplied by the Laboratory Coordinator. The location of the sample should be recorded. The samples must be at least 100 grams. (approx. 4 oz.) in weight.

5.2.5b LABELING

Each sample container shall be labeled as described in the FSP, an appendix to this document.

5.2.5c SAMPLE HANDLING

All samples will be labeled and placed in a portable cooler and maintained at a minimum of 4 degrees C. The samples should be delivered to the designated central drop off at the end of the day. The samples are to be placed in a designated refrigerator every workday to be later picked up by an On Site Inspector.

5.2.5d CHAIN OF CUSTODY

A Chain Of Custody form (COC) will be completed by all the field crews before delivering samples to the dropoff. A sample COC form is provided in the Field Sampling Plan (FSP).

5.2.6 FILL MATERIAL PLACEMENT

Prior to the mercury containment device installation, soil (designated by the Field Specialist) or selected backfill material should replace any soil removed as a result of the Investigation/ Remediation process. Soil sampling of the fill material is described in more detail in the QAPP.

5.2.7 MERCURY CONTAINMENT DEVICE INSTALLATION

Refer to an EPNG Job Safety Analysis for the installation of the permanent mercury containment device found in Appendix B.

5.2.8 METER HOUSE PLACEMENT

Refer to an EPNG Job Safety Analysis for the installation of the meter house found in Appendix B.

5.2.9 DECONTAMINATION PROCEDURES

All non-disposable tools and sampling equipment will be decontaminated by washing prior to beginning the field work. The Lab Coordinator or the designated analytical laboratory will provide pre-cleaned sampling containers and disposable scoops for all samples and sampling operations.

If the small sampling tools are to be reused, sampling tools will be decontaminated as described below:

* A thorough wash using a phosphate free detergent and a brush, if required, to remove all particulate matter.

* A thorough rinse with deionized water to remove detergent.

* A rinse with 0.1 N nitric acid.

* A final rinse with deionized water which will be sampled and labeled as the rinsate sample.

Digging tools will be cleaned according to the following procedure before site mobilization and between handling of samples:

* Wash in tap water and detergent

* Rinse with tap water

* Air dry

* Wrap in foil or plastic

Rinse water will be containerized, transported, and stored in the soil stockpile area. Small amounts of wash water and rinse water may be added to the excavated soil.

Personnel

Personnel decontamination procedures and practices are provided in 9.3 of the Health and Safety Plan.

Light Equipment Decontamination

Light equipment such as air monitoring equipment and respiratory protection equipment will be decontaminated in the contamination reduction zone. Equipment that may be damaged by water, such as air monitoring equipment will be carefully wiped clean using a sponge and detergent water, and rinsed with water. Following decontamination, sampling equipment will be placed in the Support Zone. If the sampling equipment is not to be used immediately, it will be covered or wrapped in plastic sheeting to minimize potential contamination via airborne contaminants.

Each individual employee will be responsible for decontamination of his own personal respiratory protection equipment according to manufacturer recommendations. A more detailed and specific decontamination procedure is provided in Section 9.3 of the H & S plan.

5.3 LABORATORY/ANALYSIS/VALIDATION

5.3.1 ANALYTICAL PROTOCOL

The analytical protocols to be followed for the chemical analysis of samples shall be in accordance with the QAPP. Analytical testing will be for the concentration of mercury in the leachate extracted using the TCLP extraction procedure. The extraction procedure will be performed using EPA Method 1311. The analysis

for mercury will be performed in accordance with the "U.S. EPA Contract Laboratory Program, Statement of Work for Inorganic Analysis, Multi-Media, Multi-Concentration", SOW No. 788, revised February 1989 and June 1989. Complete analytical protocols and analytical QA/QC requirements are addressed in the QAPP.

5.3.1a DATA VALIDATION

Validation of chemical analyses for mercury concentration will be completed in accordance with the "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis", dated July 1, 1988 and prepared for the USEPA Hazardous Site Evaluation Division. Validation of the procedure for the TCLP extraction will be completed in accordance with the procedures described in the QAPP. All data will be validated before any results are entered into the validated data base. The validation process will be done independently from the laboratory performing the analytical work.

Validation procedures will be followed for all samples analyzed and the results will be summarized in a report for each group of analytical data. Rejected data (not meeting established criteria) will not be entered into the validated data base. However, qualified data will be reported as such and the appropriate qualifiers will be used in the report. TCLP results will be validated in procedures as set forth in the work plan. The following is a brief description of the procedure that will be used in the data validation of laboratory data.

1) Compile a list of all investigative samples

2) Compile a list of all QC samples, including but not limited to:

* Rinsate Samples
* Field blanks
* Field duplicates
* Reference soil samples
* Matrix spikes (post leachate spike)

3) Review chain-of-custody documents for completeness and correctness.

4) Review laboratory analytical procedures and instrument performance criteria for, but not limited to:

* Sample or leachate preservation
* Sample holding time
* Leachate holding time
* Instrument performance/calibration
* Detection limits
* Laboratory blanks/instrument standards
* Matrix spike recovery

* Reference soil recovery

* Field blanks recovery

* Rinsate analysis

* Comparison of duplicate recoveries

* Impurities from reagents

* Mercury identifications

* Mercury qualification/quantification

* System performance

* Overall assessment of the data for a sample delivery group.

* Precision, accuracy, and completeness

5) A data summary will be prepared which includes, but not limited to:

* Validated results

* Sample locations

* Proper concentration units

* Proper significant figures

* Reported detection limits

This data summary will be reviewed for potential data quality problems including:

* Unexpected results

* Laboratory contamination

* Cross-contamination in the field

* Performance on quality control samples

As stated, actual details of the validation process are addressed in the QAPP and will be in accordance with EPA requirements.

5.3.2 FIELD OBSERVATION VALIDATION

The observations and measurements made at the meter stations will be recorded on the Meter Site Data Form. These forms will be left with the soil sample at the central drop off point. These forms will be delivered to the EPNG Farmington Lab Coordinator with the samples and chain-of-custody forms. The lab Coordinator will collect the Meter Site Data Forms and transmit them to the Field Operations Coordinator or his representative who will check the forms for completeness and accuracy. The Field Operation Coordinator will approve the completed forms and transmit them to the Field Data Clerk.

5.4 DATA REDUCTION AND EVALUATION

Analytical Data will be reviewed, and validated by the laboratory coordinator or his representative to determine if it conforms to the objectives of the project. The data evaluation process will be an on-going process that is continuously performed and, when indicated by the data evaluation, may result in changes to the scope of work (i.e. work plan, FSP). New data will be evaluated and compared with existing data to verify that all the necessary data has been compiled. Verification samples will be compared to the present regulatory requirement for TCLP of 0.2 mg/l.

The results of the evaluation will determine whether a site has to be revisited for further excavation or if the site can be finalized as per the description in 5.2.7 and 5.2.8.

5.5 DATA MANAGEMENT

Due to the extensive amount of information that will be generated, a data management system consisting of field activity documentation, data entry and data management will be implemented.

5.5.1 FIELD ACTIVITIES DOCUMENTATION

Documentation of the field activities will be detailed in the FSP. The documentation requirements will generally consist of the following:

(i) Meter Site Data Form This investigation/remediation report will be written on a standard form Figure 5, and as a minimum, will include a meter code number,

crew number, field measurements (temperature, vapor readings, etc.), observations and sample locations.

(ii) Standard Information Forms These records will provide summary information, hot work permits, mercury spill reports etc. Forms of this nature will be retained in the permanent files.

(iii) Chain-of-Custody These records will originate in the field at the time of sample collection (as outlined in the FSP & QAPP) and will be fully executed. Copies of the chain-of-custody records will be retained from the field for the permanent files until replaced with the fully executed copy that is returned from the laboratory.

5.5.2 SAMPLE MANAGEMENT

Due to the extensive sampling efforts required, a detailed sample management program will be implemented. An outline of the sample management is presented in Figure 6. As part of the data validation process, sample tracking is performed. As each set of data are validated, the analytical results will be transferred to a computerized data base management system. The data will be stored under the categories of data collected and data analyzed. This system will enable retrieval of information specific to various uses and provides management information for the long term project. (as described above). The data may be graphically presented in the form of tables or figures. Sample management is further detailed in the FSP.

5.5.3 DOCUMENT CONTROL AND INVENTORY

In addition to the field documentation briefly described in Section 5.5.1, the scope of documentation related to this project will include at a minimum, the following:

* Project plans
* Submittal's (i.e., progress reports, summary reports, project reports etc.,)
* Meeting notes
* Memoranda
* Laboratory data

Documents will be permanently filed in a secured facility with access restricted solely to project personnel. Documents will be filed by project number, and category (H&S, QAPP, Regulatory, Weekly Reports, Data Validation, etc.) Subcategories will be established where necessary (for example under the H&S & QAPP, submittal's may be sub-categorized into QA/QC, H&S, Work Plan, etc.) Each document should refer to an alphanumeric code referring to an established ESAD category.

5.5.4 FILING CODES

The project filing codes should be referenced on all project documents. All documents generated for this project shall be filed under these specific codes.

The general project number assigned to the mercury meter site Investigation/Remediation project is 10014.

FILE HEADING		FILING CODE
Health and Safety/Quality Assurance Plan, General		10014.A.O
Protocol Review		10014.A.1
QA/QC		10014.A.2
QA/QC Oversight		10014.A.3
Laboratory Audits		10014.A.4
Medical Program		10014.A.5
Work Plan		10014.A.6
Laboratory Contracting		10014.A.7
QA File		10014.A.8
Regulatory Issues		10014.B
Weekly Reports		10014.C
Disposal Contractor	General	10014.D
	Contracting	10014.D.1
	Manifest	10014.D.2
Data Validation	Master List	10014.E
Crew 01		10014.E.1
Crew 02		10014.E.2
Crew 03		10014.E.3
Crew 04		10014.E.4
Crew 05		10014.E.5
Crew 06		10014.E.6
Crew 07		10014.E.7
Resource Recovery	General	10014.F
Incident Reports	General	10014.G
Past Remediation	General	10014.H

5.6 COMMUNICATIONS/REPORTING

5.6.1 NAMES, TELEPHONE NUMBERS AND, KEY PERSONNEL

The names and telephone numbers of key personnel represented in the Corporate and Project organization chart (Figure 7 & 8, respectively) are listed below.

PROJECT EXECUTIVES -

Mr. J.W. SOMERHALDER
Vice President
Office Telephone: (915) 541-5340

Mr. L.R. TARVER
Vice President
Office Telephone: (915) 541-5050

PROJECT MEMBERS

Project Manager	Mr. M.D. Blanco	
	Office Tel.	(505) 599-2269
	Home Tel.	(505) 327-7553
	Fax No.	(505) 599-2119
North Region Compliance Manager	Mr. K.E. Beasley	
	Office Tel.	(915) 541-2146
	Home Tel.	(915) 584-5947
	Fax No.	(915) 541-5947
Task Manager/ESAD	Mr. M.W. Chintis	
	Office Tel.	(915) 541-2839
	Home Tel.	(915) 581-5041
	Fax No.	(915) 541-5569

Health & Safety Officers	Mr. J.E. Dolan Office Tel.	(505) 599-2106
	Mr. R. Rojas Office Tel.	(505) 599-2108
QA/QC Officer	Ms. S.D. Miller Office Tel.	(505) 599-2141
Laboratory Coordinator (QA/QC Alternate)	Mr. J.A. Lambdin Office Tel.	(505) 599-2144
Field Operations	Mr. C. Allen Office Tel.	(505) 599-2219

5.6.2 CORRESPONDENCE/WEEKLY ACTIVITY REPORT

The weekly report should be submitted to the Farmington Division Director by the Farmington Project Manager on/or before Wednesday at 12:00 NOON every week.

The report will list the following items:

STATUS -

* Significant progress or lack of progress achieved during the week, per facility, including a short narrative of the project activities.

* General description of weather conditions and their effects on progress.

* Job visitors, including inspections by regulatory agencies.

SCHEDULE -

* Status of Schedule.

* The following week's anticipated schedule.

* The schedule report will include an outline of the activities to date and forecasted. If behind schedule, provide reasons for such occurrence.

* Remediation status report per facility.

BUDGET -

* Weekly status of expenditures (originally estimated, actual, and estimated to completion).

PROBLEMS -

* Items listed under this topic are typically areas requiring technical or administrative assistance (e.g., contract difficulties, procedural problems, etc.)

DISTRIBUTION -

* Copies of the typed report should be sent to the ESAD Task Manager, the compliance Manager, the QAPP Officer, the Laboratory Coordinator, the H & S officers, operations coordinator and EPNG senior management personnel.

5.7 SITE SAMPLING AND ANALYSIS PLAN

A Site Sampling and Analysis Plan consists of two parts, (1) a Quality Assurance Project Plan (QAPP) describing the policy, organization, functional activities and a quality assurance and quality control protocols necessary to achieve the Design Quality Objectives (DQO) and (2) the Field Sampling Plan (FSP) which is incorporated as the appendix to the Work Plan and provides guidance for all fieldwork by defining in detail the sampling and data gathering methods to be used. The QAPP and WP/FSP are provided as separate documents to facilitate the use of the WP/FSP in the field.

5.8 DISPOSAL

Each employee is responsible for placing all mercury contaminated materials in the appropriate dedicated containers.

5.8.1 SOIL

All fiberglass containers filled with soil should be sealed with strapping tape, by removing air and twisting liner tops tightly and taping securely. Field Personnel have three days after a container is filled to transport the soil to the central collection center within the North Region for disposal. The central collection center for the North Region, Farmington Division is:

CHACO CAMP SITE AND THE OJITO FIELD DISTRICT

5.8.2 MISCELLANEOUS

The plastic bags of contaminated towels/wipes, rubber gloves, paper coveralls and other disposable material used in the cleanup should be placed into separate dedicated disposal containers at the designated central collection center to await collection by the contractor for disposal.

5.8.3 CENTRAL COLLECTION CENTER

Mercury contaminated material disposal containers stored at the central collection centers shall be placed in an area away from vehicle traffic, off the ground and covered to prevent rain or snow from accumulating on the top.

5.8.3a LABELS

Containers shall be labeled with "Soil", "Scrap Metal and Wood" and "Lab Pack", and the date mercury contaminated material was initially placed in the containers. Meter numbers should also be stenciled on all containers. Containers provided by the King Bag and Manufacturing Company will have the following information stenciled on the side:

R Q Hazardous Waste Solid,
NOS, ORM-E NA 9189 (D009)
MERCURY CLEANUP DEBRIS
DATE _____

5.8.3b STORAGE

Filled containers of mercury contaminated material retained at the central collection center must be disposed of within

90 days at an approved waste disposal facility after it has been determined that the material is hazardous.

5.8.3c LOG

A log must be kept for each container indicating the material type and its source. The log shall be kept by the Field Operations Coordinator.

5.8.4 TRANSPORTATION/DISPOSAL

Materials shall not be disposed of without authorization from the ESAD Task Manager. ESAD will coordinate the disposal of all mercury contaminated materials with Field Operations Coordinator. Prior to shipments being released for transport, an EPA form 8700-22, Uniform Hazardous Waste Manifest shall be completed. This is a Bill of Lading and is presented in Figure 9.

The transport company presently authorized to transport containers from the Chaco Plant is:

Name: (to be determined)

Contact:

Telephone No:

5.8.5 LANDFILL SITE

The designated landfill receiving EPNG mercury contaminated soil and miscellaneous materials is:

Name: (to be determined)

Contact:

Telephone No.:

6.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

The Mercury Meter Site Investigation/Remediation project is considered an EPNG Operations and Engineering Function. The organizational structure for this Function is illustrated in Figure 7.

Management personnel from EPNG's Farmington Division, North Region Engineering Compliance (NREC) and Environmental and Safety Affairs Department (ESAD) will be utilized for the Farmington Project as high-lighted in Figure 7. Description of primary project personnel and their responsibilities are presented below:

6.1 AUTHORITY AND RESPONSIBILITIES

The authority and responsibilities of the persons presented on the Farmington project organization chart on Figure 8 are as follows:

6.1.1 PROJECT MANAGER

Mr. M.D. Blanco, Division Project Manager for the Farmington Division, will serve as Project Manager for activities in the Farmington Division. Project Management responsibilities and activities will include but not be limited to:

* Scheduling field activities
* Data management
* Project budgeting
* Manpower management

* Project coordination

The Project Manager will rely on the North Region Compliance Manager for matters pertaining to quality assurance and health and safety issues.

6.1.2 COMPLIANCE MANAGER

Mr. K.E. Beasley, North Region Engineering Compliance Manager, will serve as the project's Compliance Manager. The Compliance Manager will act independently from the Project Manager and will be responsible for the following activities:

* Advising the Project Manager
* Managing quality assurance
* Managing health and safety
* Monitoring the progress and direction of the project
* Monitoring compliance of the project with QA objectives

The Health and Safety Officer and the QA Officers report directly to the Compliance Manager. The Compliance Manager has the authority to provide final rulings on interpretations for the work plan, QAPP and the Health and Safety Plan.

6.1.3 ESAD TASK MANAGER

Mr. M.W. Chintis, Senior Environmental Scientist for ESAD, will serve as the ESAD Task Manager. The ESAD Task Manager will provide project support in the environmental, safety, regulatory and technical areas. His responsibilities will include but not be limited to:

* Ensure that the Work Plan, QAPP, Health and Safety Plan and all project activities are in accordance with all current applicable regulations.

* Coordinate all regulatory agency matters with the project's Regulatory Liaison Consultant.

* Administer the contracting of all project laboratories hazardous waste disposal and resource recovery operations

* Administer the contracting of all consulting work and act as the liaison with all project Consultants

* Coordinate all QA/QC oversight services performed by the Consultants screen and advise on all corrective measures recommended by Consultants

* Administer the collection and storage of all validated project records, data and calculations

* Provide project consulting in all technical areas

* Distribute all consultant correspondence to the Project Team

6.1.4 REGULATORY LIAISON CONSULTANT

Mr. J.C. Bridges, Environmental Consultant for ESAD, will serve in the capacity as a Regulatory Liaison Consultant. His responsibility is to participate in communications with government regulators and agencies on the behalf of EPNG for this project. He will provide regulatory interpretation for EPNG. The Regulatory Liaison Consultant reports to the ESAD Task Manager.

6.1.5 QA/QC OFFICER

Ms. S.D. Miller, Senior Compliance Specialist for North Region Engineering Compliance Engineering, will serve as the project's QA Officer. The QA Officer will be responsible for verifying that sampling and analytical operations are carried out in compliance with the QAPP. The QA Officer or her designee will perform audits of field and lab documents and specify corrective action as required. The QA Officer will report the QA audit results to the Compliance Manager. Mr. J.A. Lambdin will serve as the Lab Coordinator and Alternate QA Officer.

6.1.6 LAB COORDINATOR

Mr. J.A. Lambdin, Regional Lab Superintendent for the North Region will be the project Lab Coordinator. The Lab Coordinator's responsibilities will include but not be limited to:

* Preparing sample containers for field activities

* Receiving samples from the field

* Validating and checking the completeness of chain-of-custody forms.

* Preparation and shipping of samples to the analytical laboratory

* Preparation and maintenance of soil samples to be used for field blanks

* Coordination with the designated analytical laboratories including any laboratory audits

* Validation of chemical analysis results

* Approval of chemical analysis result for entry into the validated data base

* Serving as an alternate QA Officer

6.1.7 FIELD OPERATIONS COORDINATOR

Mr. J.C. Allen, Division Coordinator for special projects in the Farmington Division, will serve as the project's Field Operations Coordinator. His responsibilities will include:

* Supervise and schedule work crews

* Conduct all crew safety meetings

* Procure, manage and distribute all field supplies, equipment and materials

* Ensure the proper maintenance and calibration of field instruments and equipment

* Administer the budget associated with field operations

* Ensure that field activities conform to the Work Plan, QAPP and Health and Safety Plan requirements

* Obtain validated forms from the Lab Coordinator, perform additional verifications, enter pertinent data into the project's data base, organize and release data to the ESAD Task Manager

6.1.8 FIELD STAFF

The Field Operations Coordinator will supervise seven crews, two Field Inspectors and a Field Data Clerk. The Field Specialist will be the lead in each crew and will have the following responsibilities:

* Protect the health and safety of site workers

* Record all site and sample information and complete the Chain-of-Custody form, Meter Site Data form and all other required forms

* Collect and preserve site samples per QAPP procedures

* Coordinate and supervise all site activities

6.1.9 HEALTH AND SAFETY OFFICER

Mr. J.E. Dolan and Mr. R. Rojas, Senior Safety Representatives for the North Region Safety Department, will serve as the Project Health and Safety Officers. Their responsibilities will include:

* Oversee and or conduct all training provided to field crews associated with the Health and Safety Program

* Ensure that all site activities are conducted in accordance with the Health and Safety Plan

* Provide field audits of health and safety procedures and implement corrective measures

* Evaluate mercury vapor levels for Level B PPE requirement, and provide oversight of all activities involving Level B PPE

* Verify the medical and training qualifications of personnel that will participate in the field activities

* Monitor the medical surveillance program and approve personnel to continue participation in the field activities

* Oversee all field crew safety meetings

* Audit maintenance and calibration of health and safety related instruments

7.0 SCHEDULE

The Farmington Mercury Meter Site Investigation/Remediation project is expected to be completed by December 1993. Individual Investigation/Remediation schedules will be presented to each Field Specialist. The project will stop work in January and restart at the end of March every year (Farmington's winter period).

FIGURES

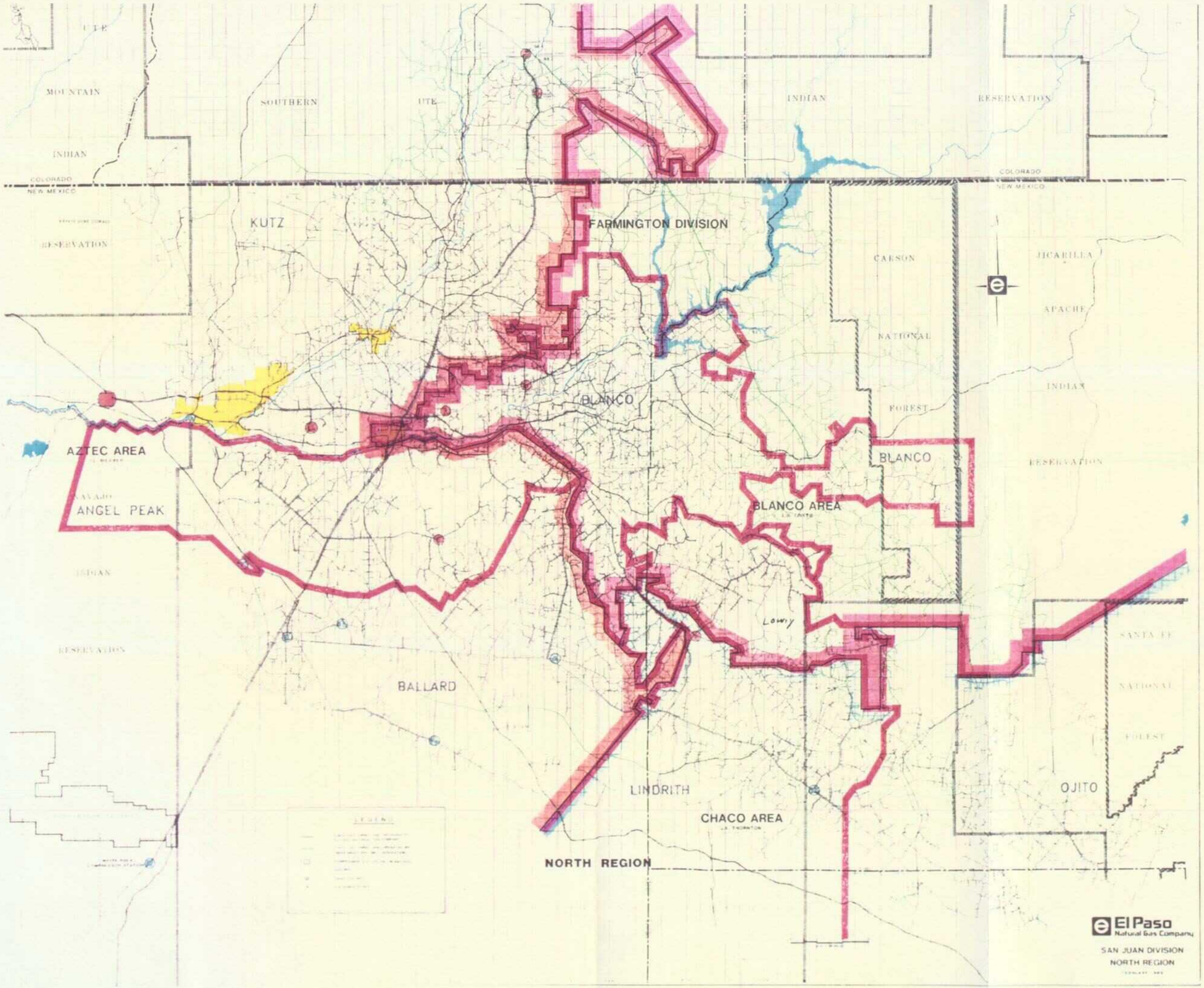
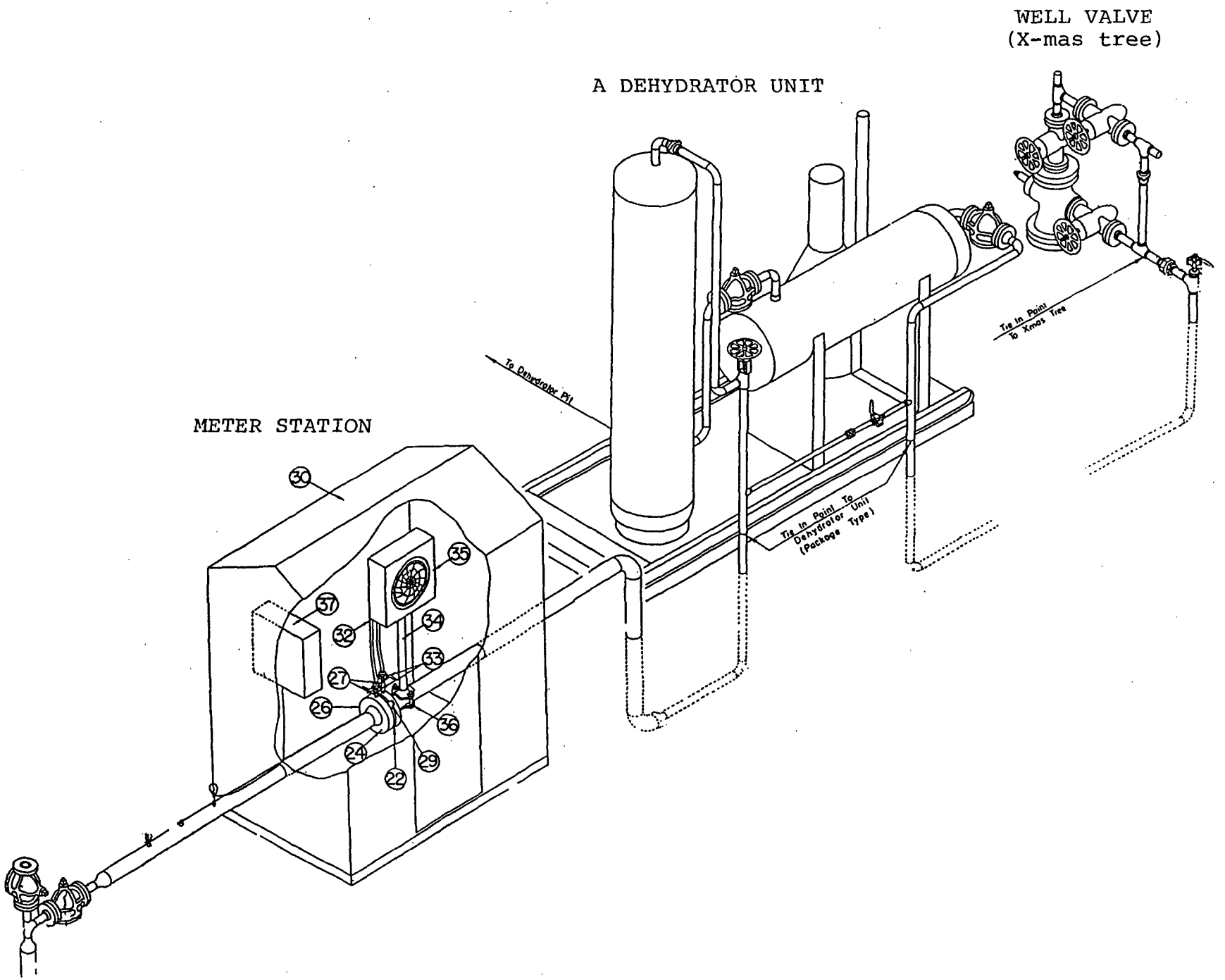

UTE
MOUNTAIN
INDIAN
COLORADO
NEW MEXICO
SOUTHERN
UTE
INDIAN
RESERVATION
COLORADO
NEW MEXICO
KUTZ
FARMINGTON DIVISION
RESERVATION
CARSON
JICARILLA
APACHE
NATIONAL
FOREST
INDIAN
RESERVATION
BLANCO
AZTEC AREA
BLANCO
BLANCO AREA
NAVAJO
ANGEL PEAK
INDIAN
RESERVATION
Lowry
SANTA FE
NATIONAL
FOREST
BALLARD
LINDRITH
CHACO AREA
OJITO
NORTH REGION
El Paso
Natural Gas Company
SAN JUAN DIVISION
NORTH REGION

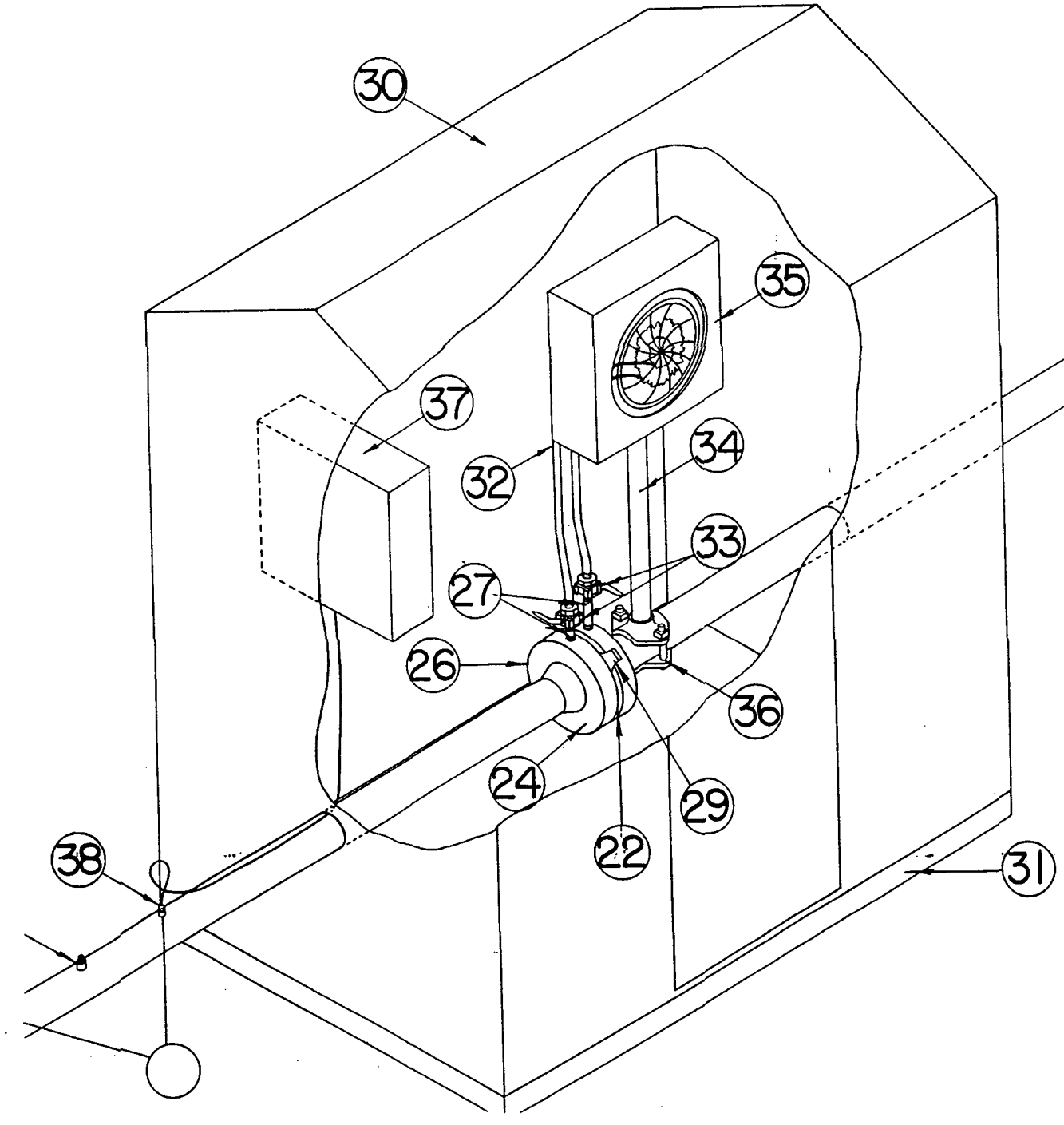
Figure 1



DETAIL OF TYPICAL WELL SITE
FIGURE 2

Figure 2

DETAIL OF TYPICAL FLOW METER STATION



NOTE: Refer to Section 2.2.2 of the Work Plan for a detailed description of the Flow Meter Station

FIGURE 3

El Paso Natural Gas Company

WORK PERMIT	☐ Hot Work ☐ Entry ☐ Excavation	Date	Time

Plant / District / Department	Unit/Area	Specific Equipment

Work To Be Done:

Test Results:	Combustible (% L.E.L.)	Oxygen %	Other	Signature of Tester:

Operational Requirements:	Yes	Not Applicable
(1) Equipment has been isolated mechanically / blinded, etc. in accordance with the location isloation procedures.		
(2) Equipment has been depressured and drained.		
(3) Other work in which presents a hazard to this/that work being carried out.		
(4) Equipment and area is clear of combustible materials.		
(5) Sewers/drains properly sealed.		
(6) Work involves interconnecting units/area.		
(7) If yes, have/area affected by this work been notified/cleared.		
(8) Equipment has been purged to air, cooled, tested and safe to enter.		
(9) Area drawings have been inspected and it is safe for excavation to take place in the area specified on the permit.		

(10) Fire Protection Required: ☐ Water Hose and Nozzle ☐ Fire Extinguisher ☐ Fire Watch ☐ Other

Special Instructions:

Area has been inspected and tested for gas leakage, other combustibles, etc. and it is safe.	Signature: (Technician)
It is safe for excavation to take place in the area specified on the permit.	Signature: (Engineer)
Operational safety requirements and work to be done are fully understood.	Signature: (Craftsman)
Area has been inspected, tested and cleared for work specified on the permit.	Signature: (Safety Representative)

The above work has been completed satisfactory and accepted by Operations, all equipment has been removed and the area left in a clean condition. Time Completed: _____

Signature (Technician) _____ Signature (Craftsman) _____

FM-08-00466 (3-86)

White — Technician Canary — Craftsman Pink — Safety Representative/Engineer

EPNG - HOT WORK PERMIT

FIGURE 4

METER SITE DATA FORM

LOCATION INFORMATION

METER CODE [ ][ ] - [ ][ ][ ] LOCATION NAME _____

DATE [ ][ ] - [ ][ ] - [ ][ ] RUN NUMBER [ ][ ]-[ ][ ]-[ ][ ]

TIME OF ARRIVAL _____ AM PM SPECIALIST _____

TIME OF DEPARTURE _____ AM PM CONTRACTOR _____

CREW NUMBER [ ][ ] RUN TECH. _____

VISITORS: _____ [ ]AUDITOR [ ]REGULATOR [ ]OPERATOR [ ]OTHER

_____ [ ]AUDITOR [ ]REGULATOR [ ]OPERATOR [ ]OTHER

_____ [ ]AUDITOR [ ]REGULATOR [ ]OPERATOR [ ]OTHER

OBSERVATIONS

METER TYPE: [ ]MERCURY [ ]EFM [ ]DRY FLOW

IS A METER HOUSE PRESENT? [ ]YES [ ]NO

FLOOR TYPE: [ ]NATURAL [ ]MANMADE

SOIL TYPE: [ ]SAND [ ]CLAY [ ]SANDSTONE

[ ]LOOSE GRAVEL [ ]LOOSE ROCK

[ ]OTHER _____

WEATHER CONDITIONS:

WIND: [ ]CALM [ ]BLOWING DUST

MOISTURE: [ ]RAINING [ ]SNOWING [ ]DRY

TEMPERATURE: _____ °F

VISIBLE MERCURY OBSERVED? [ ] YES [ ]NO

IF YES [ ]SURFACE [ ]BELOW SURFACE [ ]BOTH

VAPOR READINGS

EXPLOSIMETER READING _____ %LEL

INITIAL: BREATHING ZONE: _____ MG/M³

FLOOR: _____ MG/M³

TEMPERATURE: _____ °F

*PRIOR TO PAN INSTALLATION

*FINAL: BREATHING ZONE: _____ MG/M³

FLOOR: _____ MG/M³

TEMPERATURE: _____ °F

REMEDIATION

AMOUNT OF FREE MERCURY RECOVERED _____ POUNDS

AMOUNT OF SOIL REMOVED _____ INCHES _____ APPROXIMATE # OF lbs

NUMBER OF CONTAMINATED SKIDS [ ]1 [ ]2 [ ]3 [ ]4 [ ]NONE

OTHER ITEMS REQUIRING DISPOSAL _____

IS A RETURN VISIT REQUIRED? [ ]YES [ ]NO

SAMPLING

VERIFICATION SAMPLE# [ ][ ] - [ ][ ] - [ ][ ][ ][ ][ ] - [ ][ ] - [ ][ ] [ ]NOT SAMPLED

ADDITIONAL VERIFICATION SAMPLE TAKEN? [ ]YES [ ]NO

IF YES, SAMPLE#: [ ][ ] - [ ][ ] - [ ][ ][ ][ ][ ] - [ ][ ] - [ ][ ]

QA/QC SAMPLES TAKEN? [ ]YES [ ]NO

IF YES, TYPE: [ ]DUPLICATE [ ]BLANK [ ]FIELD RINSATE [ ]MATRIX SPIKE

QA/QC SAMPLE# [ ][ ][ ][ ] - [ ][ ][ ][ ][ ] - [ ][ ] - [ ][ ]

CHAIN OF CUSTODY FILLED OUT? [ ]YES [ ]NO

SAMPLE(S) LABELLED? [ ]YES [ ]NO SAMPLE(S) KEPT AT 4°C? [ ]YES [ ]NO

DECONTAMINATION

EQUIPMENT DECONTAMINATED? [ ]YES [ ]NO PERSONNEL DECONTAMINATED? [ ]YES [ ]NO

SPILL CONTROL MEASURES

WAS THE U-TUBE BAGGED? [ ]YES [ ]NO WAS A FIBERGLASS PAN INSTALLED? [ ]YES [ ]NO

COMMENTS: _____

_____

_____

CREW SIGNATURE _____ DATE _____

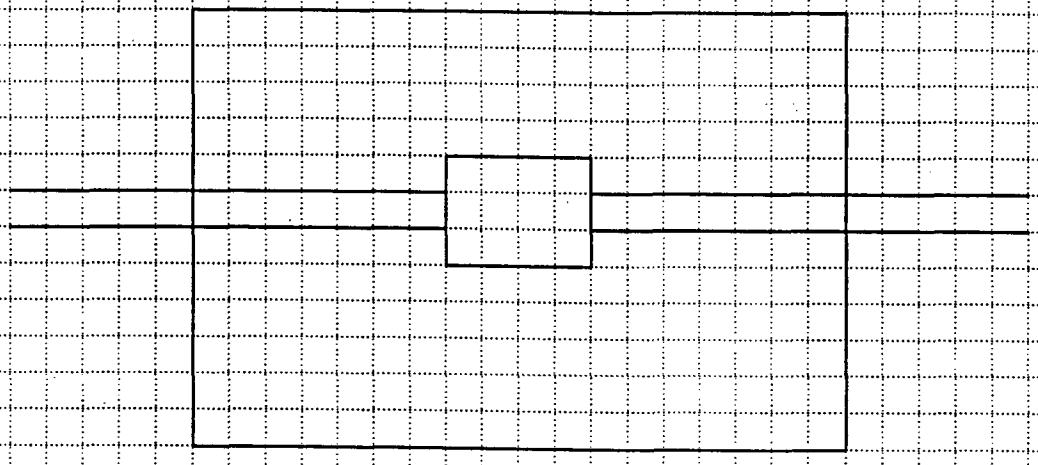
CREW SIGNATURE _____ DATE _____

CREW SIGNATURE _____ DATE _____

VALIDATION APPROVAL _____ DATE _____

Figure 5. Meter Site Data Form (Front Side)

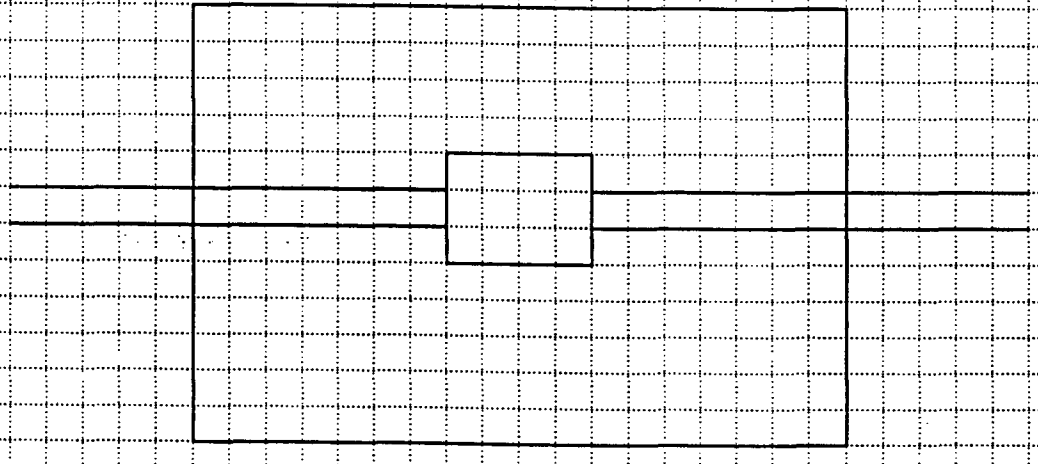
LOCATION OF VISIBLE MERCURY



1. Denote areas where visible mercury was found on the soil surface with an "S."

2. Denote areas where visible mercury was found below the soil surface with an "X." Areas marked with an "X" should be footnoted with approximate depths.

LOCATION WHERE SAMPLE WAS SECURED

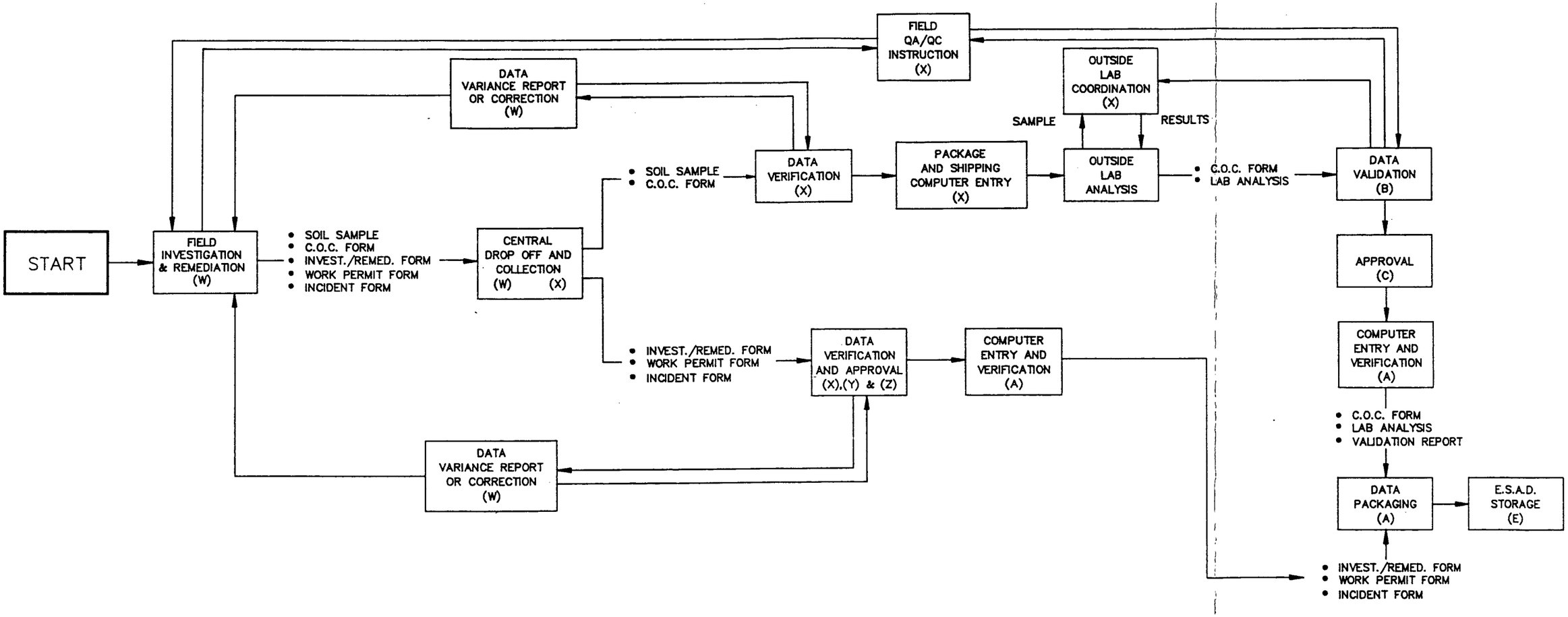


1. Denote area where primary sample was taken with "V1."
2. If a secondary verification sample was taken, denote with "V2."

Figure 5. Meter Site Data Form (Back Side)

Woodward-Clyde Consultants

90301206



LEGEND

W : FIELD CREW
X : LAB TECHNICIAN
Y : FIELD INSPECTOR
Z : OPERATION COORDINATOR
A : DATA MANAGEMENT CLERK
B : CHEMIST
C : LAB SUPERVISOR
E : ESAD DOCUMENT MANAGER

MERCURY METER SITE INVESTIGATION/REMEDATION PROGRAM

DATA & SAMPLE FLOW CHART

DATE: 3/16/90	BY: M.D.B.
REVISED : 4/17/90	
REVISED :	

FIGURE 6

Woodward-Clyde Consultants

CORPORATE ORGANIZATION CHART

LEGEND

PROJECT TEAM

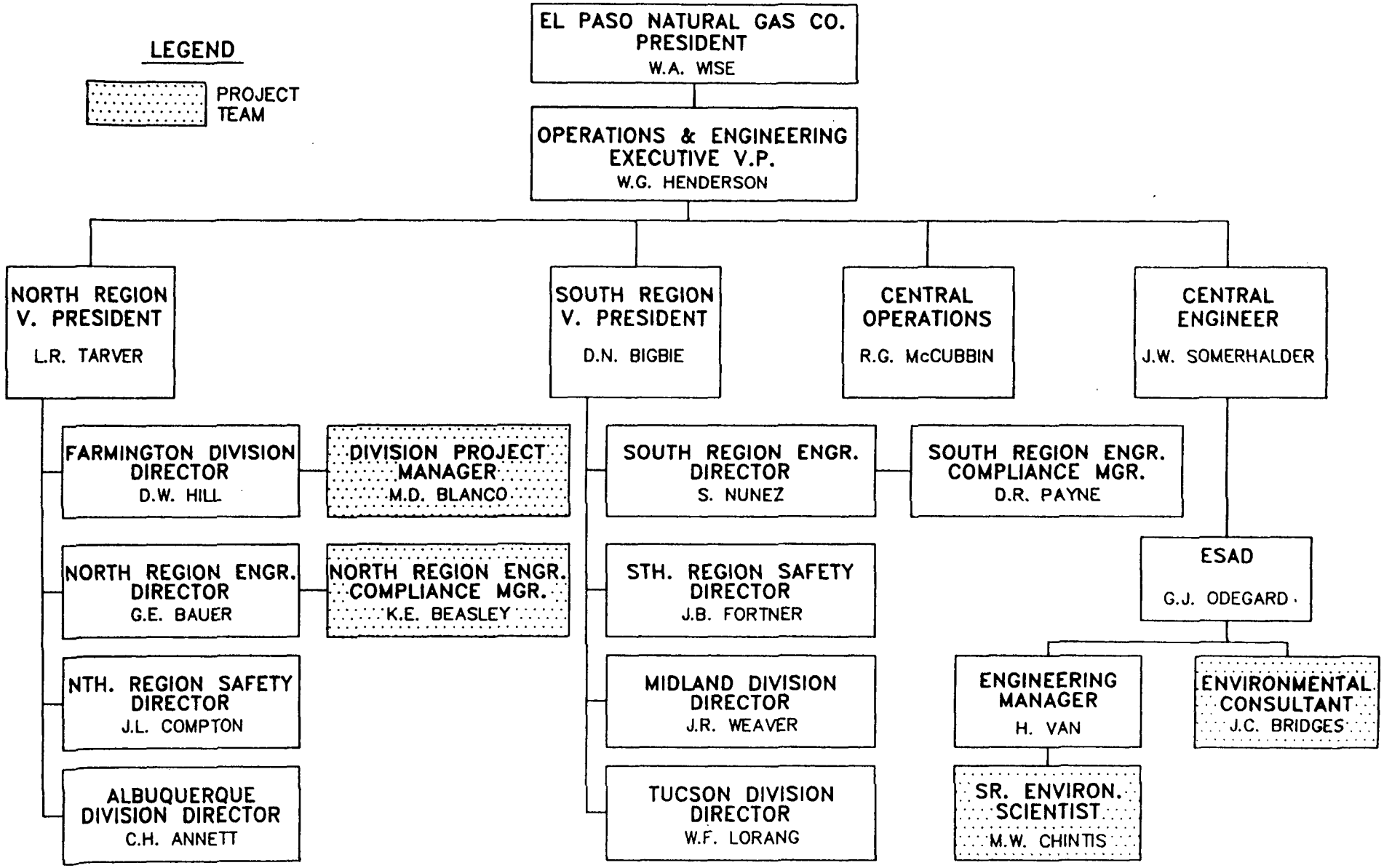


FIGURE 7

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PROJECT ORGANIZATION CHART

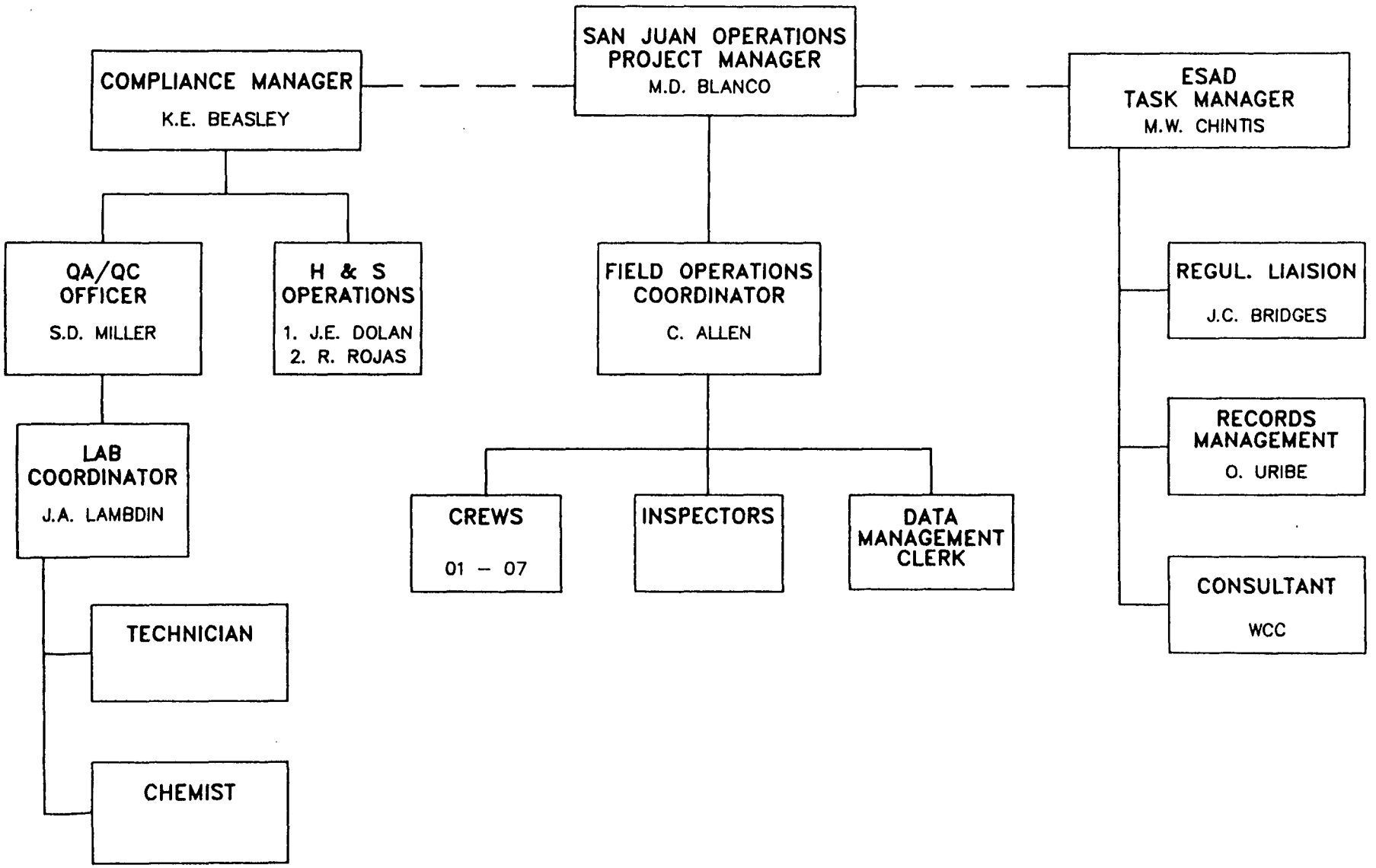


FIGURE 8

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039. Expires 9-30-91

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. | Manifest Document No.

2. Page 1 of | Information in the shaded areas is not required by Federal law.

GENERATOR

3. Generator's Name and Mailing Address

4. Generator's Phone ( )

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name | 6. US EPA ID Number

C. State Transporter's ID

D. Transporter's Phone

7. Transporter 2 Company Name | 8. US EPA ID Number

E. State Transporter's ID

F. Transporter's Phone

9. Designated Facility Name and Site Address | 10. US EPA ID Number

G. State Facility's ID

H. Facility's Phone

11. US DOT Description *(Including Proper Shipping Name, Hazard Class and ID Number)*	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a.						
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above

K. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; **OR**, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name | Signature | Month Day Year

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name | Signature | Month Day Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

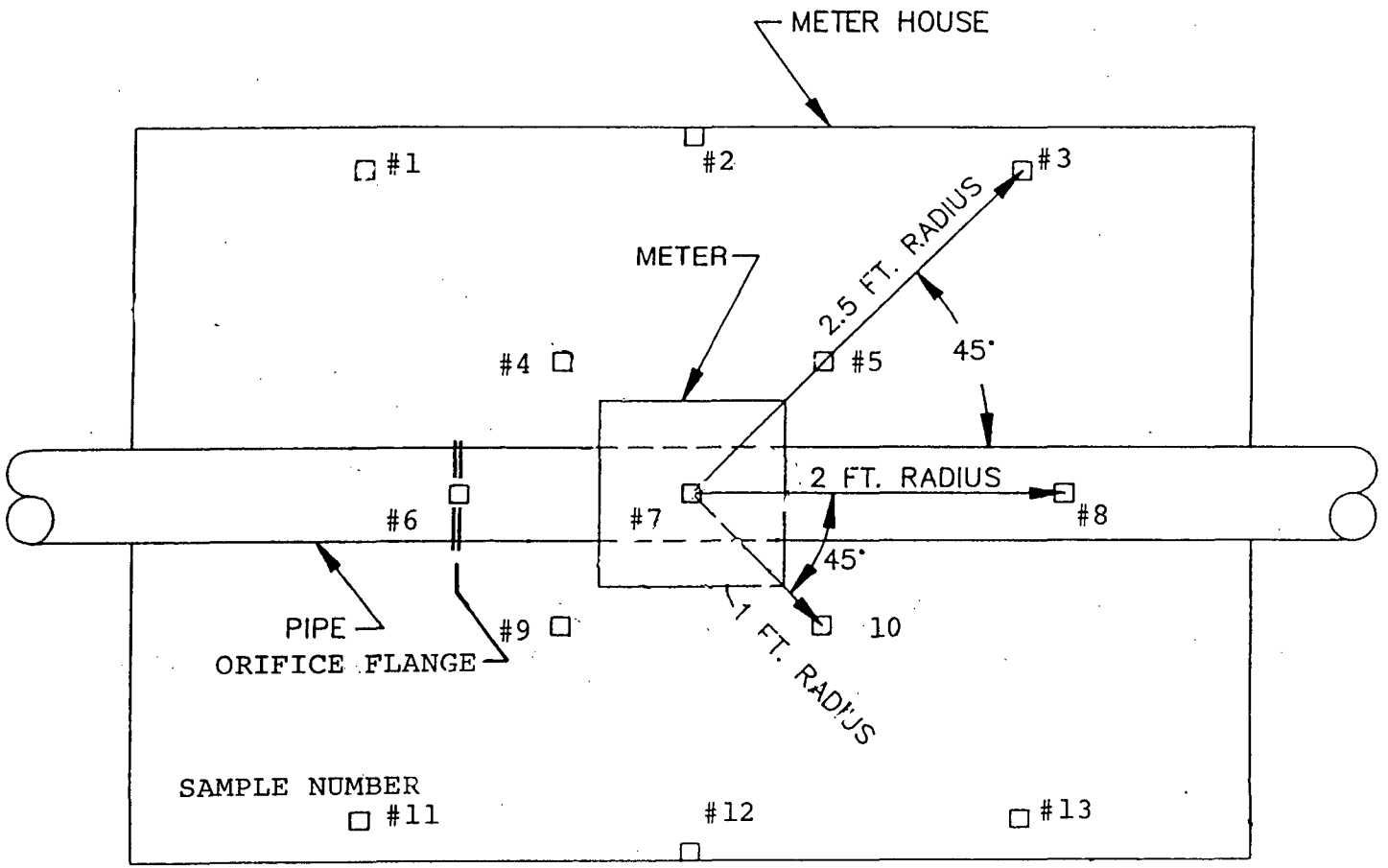
Printed/Typed Name | Signature | Month Day Year

Style F15REV-6 LABELMASTER, Div. of AMERICAN LABELMARK CO., CHICAGO, IL 60646

EPA Form 8700-22 (Rev. 9-88) Previous editions are obsolete.

ORIGINAL-RETURN TO GENERATOR

Figure 9



0 1/2' 1'-0"
SCALE IN FEET

LEGEND

□ SOIL SAMPLE LOCATION

FIGURE 10 / FILE NO. 90H3012C	NAME Merc. Invest./Remediation FOR EL PASO NATURAL GAS	Woodward-Clyde Consultants SCALE: NOTED MADE BY: P.R. DATE: 3-14-90 CHECKED BY: DATE:	VERIFICATION GRID SAMPLE LOCATION DIAGRAM	FILE NO. 90H3012C FIGURE 10

APPENDICES

DRAFT

(WORK PLAN)

APPENDIX A

MERCURY METER SITE INVESTIGATION/REMEDIATION

FIELD SAMPLING PLAN (FSP)

MERCURY METER SITE
INVESTIGATION/REMEDIATION
FIELD SAMPLING PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS (Concluded)

1.0 SITE BACKGROUND

1.1 EXISTING DATA

A discussion and an evaluation of EPNG's previous mercury meter site Investigation/Remediation program is summarized in Sections 1, 2 and 3 of the Work Plan.

1.2 DATA GAPS

This Field Sampling Plan (FSP), the Work Plan and the Quality Assurance Project Plan (QAPP) include methods and procedures designed to eliminate possible sampling and analytical data gaps. To avoid data gaps the following procedures will be implemented:

* Evaluation of the mercury levels and certification of remediation to acceptable levels of residual mercury

* Verification of the laboratory analysis utilizing field and matrix spikes

* Documentation required from the analytical laboratory to assure quality control of sample handling and analyses

* Validation of field or laboratory activities by an individual other than the person actually involved in the activities

* Preservation of samples during transit to the analytical laboratory

* Implementation of Quality Assurance procedures to prevent cross contamination of samples

2.0 SAMPLING OBJECTIVES

The primary objective in verification sampling and analysis of soils at the meter stations is to measure and verify that remediation has resulted in mercury contamination levels less than the action level of 0.2 mg/l (TCLP). Meter stations will be considered remediated if the sampling results do not exceed the action level. In the present sampling program, it will be the responsibility of the Field Specialist to determine the areas to be sampled and note these locations on the Meter Site Data Form (Figure 5). Verification samples will be collected at pre-determined sampling points as determined in Section 3.1. Section 2 of the QAPP presents the objectives for the various sampling activities proposed in the Work Plan.

2.1 GRID SAMPLING LOCATION OBJECTIVES

The primary purpose of the grid sampling effort is to be able to justify collecting only one discrete verification sample from each site after the crew has completed the investigation/remediation activities. The verification sample location should represent the area in the meter house with the highest possible leachable mercury soil contamination. The objective is obtained by demonstrating a correlation between the location of the highest concentration of leachable mercury and a common location within the mercury meter house, such as, directly beneath the meter box or the orifice flange. Based on the results, should a correlation be found only 3 randomly selected sites will be sampled, otherwise further sampling at additional sites may be required or another sampling scheme would be investigated (such as described in Section 3.2.2).

2.2 VERIFICATION SAMPLING DATA OBJECTIVES

The primary objective of collecting soil samples is to determine the concentration of leachable mercury in the soil. The concentration of leachable mercury will be compared to the regulatory limit that defines a hazardous waste. The regulatory limit is 0.2 mg/l in the TCLP leachate. This information will ultimately determine the need to continue the remediation. The results of the sampling data are expected within 10 days from the day that the laboratory receives the sample. The accuracy and precision of the verification samples are indicated in section 3 of the QAPP. Should the verification sample results exceed the action level objective, the crew will return to the appropriate metering station to continue the removal of contaminated soil, and treating the station as a contaminated site.

2.3 QUALITY CONTROL OBJECTIVES

The purpose of the Quality Assurance/Quality Control (QA/QC) procedures is to produce data that meet or exceed the requirements of standard analytical methods and satisfy the project requirements. The objectives of the QA efforts for this project are as follows:

* Provide the mechanism for ongoing control and evaluation of the quality of data measurement throughout the project

* Utilize quality control data to define data quality for various measurement parameters in terms of precision and accuracy

* Verify that all soil samples are accurately and precisely collected, analyzed and documented

The quality control purpose and definition is described in more detail in Section 3.1 of the QAPP. Field Sampling Quality Objectives for field duplicates, field blanks, and matrix spike samples are further described in Section 3.4 of the QAPP.

3.0 SAMPLE LOCATION, FREQUENCY AND CHEMICAL ANALYSIS

3.1 GRID SAMPLING

EPNG will undertake a grid sampling effort at three randomly selected meter sites. This sampling effort will provide data to demonstrate that a single discrete soil sample collected at a predetermined location is representative of the highest concentration of leachable mercury for the meter site. Further verification sampling at other flow meter sites will then only require collecting one discrete soil sample at the location of expected highest soil contamination. Although the meter house's dimensions are only 4 feet by 6 feet (a small sampling area), demonstrating the nonuniform distribution of the mercury contamination requires a least two sampling intervals, each radiating outward from the meter. A rectangular grid pattern for sample locations has been selected to adequately cover the floor dimensions. The grid pattern, as shown in Figure 10 (page 3-7), has radii of one, two and two and a half feet where each interval has been rotated 45 degrees. A sample will also be collected from under the flow meter for each set of samples. These samples, collected under the grid sampling activities, will be analyzed by TCLP for mercury using EPA CLP SOW No. 788.

EPNG will perform the grid sampling in the pattern shown on Figure 10. Grid samples will be collected from the meter site floor before any soil removal and after removal of one 4 inch lift of soil. This provides two sets of thirteen samples from each of the meter sites.

This sampling scheme should demonstrate where the highest concentration of mercury is located and may demonstrate that this

concentration occurs typically at the same location within the various meter houses, thereby justifying a single discrete verification sample.

3.2 VERIFICATION SAMPLING

Verification sampling can only occur after the soil at the meter site has been screened for indications of mercury contamination. The screening activities consist of visually inspecting for indications of mercury contamination and using a mercury vapor detector. The site is considered ready for a verification sample only after the screening activities show no further signs of mercury soil contamination.

The characteristics of Verification sampling will be determined by the results of the grid sampling procedures described in Section 3.1.

3.2.1 SUCCESSFUL GRID SAMPLING RESULTS

Should the results of the grid sampling procedures demonstrate a positive correlation between the highest leachable concentration of mercury and a common location within the metering houses, then only one discrete verification sample is to be taken at the specified common area.

3.2.2 UNSUCCESSFUL GRID SAMPLING RESULTS

Should the results demonstrate no correlation between the location and mercury concentration, a composite sample of 5 discrete subsamples from each of the four corners of the meter house, approximately 1 foot from each wall and one sample directly beneath

the meter /orifice plate should be taken. One sampling tool may be used to collect all 5 discrete subsamples. The subsamples will be composited and thoroughly mixed either in the sample jar or in a clean separate container. The composite sample should consist of an equal volume mixture of soil from all 5 discrete subsamples and will be analyzed according to the procedures as outlined in section 3.4. The action level for this type of sampling scheme is 0.04 mg/l of mercury in the TCLP Leachate.

3.3 QUALITY CONTROL SAMPLES

Quality control samples will be collected at frequencies no less than those shown in Table 1. The quality control samples will be analyzed in accordance with Section 7 of the QAPP. The QC sampling procedures are described below:

3.3.1 FIELD DUPLICATES

Field Duplicate Samples are analyzed to verify the precision of results of the sampling and laboratory testing procedures used for the verification samples. For every 20 verification samples a field duplicate sample is taken. These samples are treated in the same manner as verification samples and are extracted from the same location as a verification sample.

3.3.2 FIELD BLANKS

A large quantity of soil will be collected from various locations within the San Juan Basin. The soil will be combined, mixed, stockpiled and tested by TCLP. The Laboratory Coordinator will provide the Field Specialist with a small box of soil (from the stockpile) which he is to sample after completing a verification

sample. The sample collection procedure from the box should be similar to the method used for verification sampling. An increase in the mercury level over that defined by the soil characteristics for a field blank sample may indicate improper sampling procedures resulting in cross contamination. For every 20 verification samples a field blank is collected.

3.3.3 MATRIX SPIKE SAMPLES

A matrix spike will be performed on designated verification samples. A duplicate aliquot of the leachate from the verification sample will be spiked with a known quantity of mercury by the laboratory after the extraction process. The Field Specialist will designate which verification samples will be spiked. Matrix spike samples shall be collected, handled, and analyzed in the same manner as verification samples. Matrix spike samples must be labeled as such in the field at the time they are collected. The matrix spike sample is used to verify the laboratory testing procedures. For every 20 soil verification samples a matrix spike is required.

3.3.4 RINSATE SAMPLES

Rinsate samples are water samples obtained from sampling equipment which are to be utilized in the verification phase. Rinsate samples are required of all disposable type sampling equipment prior to their use by the field crews. Sampling equipment will be tested on a one per lot basis by the Laboratory Coordinator. The samples are to be analyzed for mercury contamination. Field rinsate samples are not anticipated since disposable sampling equipment will be used and discarded after each use.

The laboratory rinsate samples will be collected from the second deionized water rinse after decontaminating the sampling equipment.

TABLE 1

FIELD QUALITY CONTROL SAMPLE FREQUENCY

SAMPLING	FREQUENCY
Field Duplicates	1 in 20
Field Blanks	1 in 20
Reference Soil	1 in 100
Rinsate Blank (Lab)	1 per lot
Matrix Spike (post extraction)	1 in 20

Note: Reference soil is to be obtained from an index source and analyzed with the other soil samples.

3.3.5 FILL MATERIAL SOIL SAMPLES

Fill material designated for use to replace the soil removed at each of the metering stations as described in 4.1.5 of the work plan will be sampled and tested for mercury. Source (fill) material from a specific location will be sampled by a field Specialist as directed by the Laboratory Coordinator. Source material will be sampled and analyzed using similar verification sample testing procedures. Fill material with mercury levels above 0.2 mg/l TCLP will not be accepted. The Laboratory Coordinator will determine the number of samples to be required from the source material, 2 to 3 samples may be all that is required if the material is taken from the same location for all meter stations.

3.4 SAMPLE ANALYSIS

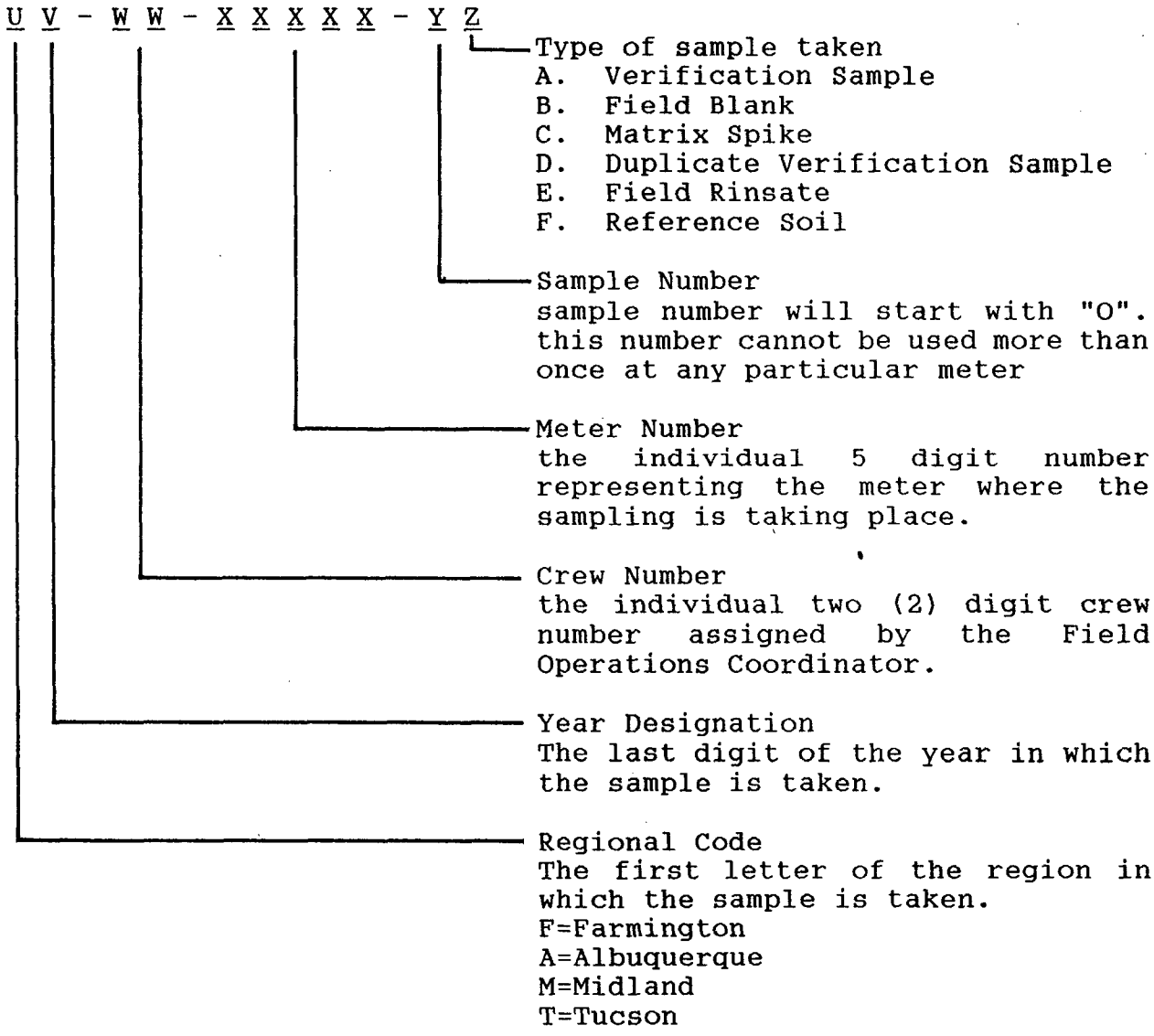
The verification samples will be analyzed in accordance with Section 7.0 of the QAPP. The chemical analyses will be assigned as follows:

* Verification samples, field blanks, duplicates, and reference soil samples will be analyzed for TCLP mercury.

The leachate will be analyzed for mercury utilizing Contract Laboratory Procedures (CLP) (as defined in EPA's Statement of Work No. 788 June 1989), extraction procedures defined in EPA Method 1311.

4.0 SAMPLE LABELING

Each sample container shall be labeled in the following format:



An example of the labeling procedure is provided below. A Field Blank sample is taken at Meter 01121 in the Farmington Region by the 02 Crew in 1990 where this is the fourth sample taken at the meter station, the label would read, F0-02-01121-4B.

The field specialist is responsible for verifying that each sample is placed in the appropriate sample container. At the time of sampling, this person must fill in the time, the date, sign and complete the sample label. By the end of the sampling day, the field specialist must deposit all samples at the drop off location.

5.0 SAMPLING EQUIPMENT AND PROCEDURES

5.1 SOIL SAMPLES

The person taking the samples (sampler) will wear clean latex gloves during sampling to protect the sample from contamination. A clean decontaminated disposable scoop will be used to fill an unused, wide mouth, 4 oz., glass or jar provided by the Laboratory Coordinator. The jar should be filled with soil and be lightly packed. The jar lid should be tightened to prevent spillage during transport.

5.2 WATER (RINSATE) SAMPLES

Rinsate samples for reusable sampling equipment are collected to verify that the decontamination procedures described in section 4.4 of the QAPP are successful while collecting the water sample (rinsate sample). The rinsate sample will be collected from the second deionized water rinse. The sample will be collected in a clean, glass, 1 liter bottle and shall be collected as follows:

1) Obtain a decontaminated trowel after it has been subjected to the first rinse with Nitric Acid.

2) Hold the sample bottle below the trowel.

3) Allow the deionized water to flow slowly over the trowel. Collect the rinsate sample as it flows off the trowel. Thoroughly rinse the trowel until the bottle is filled. More than one trowel may be rinsate in this manner in order to provide enough rinsate to fill the sample bottle.

6.0 SAMPLE HANDLING

This section provides the Field Specialist with a description of the sample preservation requirement, transport description and chain of custody procedure to be used by all field personnel.

6.1 SAMPLE PRESERVATION

The Field Specialist will be responsible for preparing the field samples and preserving the samples for shipment to the designated laboratory. Preservation of the samples is required from the time the samples are taken by the Field Specialist to the time the samples are tested and analyzed by the laboratory.

6.1.1 SOIL SAMPLES

Soil samples will be placed in a clean wide-mouth, 4 oz., glass containers, provided by the Laboratory Coordinator. The samples shall be preserved at 4 Degrees C (39.2 Degrees F). Soil samples have a maximum allowable holding time of 28 days, which means that the sample has to be tested by the laboratory prior to 28 days after the sample was taken.

6.1.2 WATER (RINSATE) SAMPLE

The rinsate sample shall be placed into a single one-liter glass bottle preserved with a nitric acid added by the Laboratory.

6.2 SAMPLE TRANSPORT

All samples are to be deposited at a central designated collection center at the end of each sampling day. The samples are to be

placed in a designated refrigerator. The samples will be picked up at the central collection center by the on-site inspector and transported to the Laboratory Coordinator at the EPNG laboratory in Farmington, New Mexico. The EPNG laboratory will prepare the field samples for shipment to the analytical laboratory. All samples will be shipped in a cooler with ice, by overnight courier from the EPNG laboratory to the designated analytical laboratory.

6.3 CHAIN OF CUSTODY FORM

An EPNG Chain of Custody Form (COC) will be completed by the respective field crew before delivering the samples to the designated central collection center. A sample COC form is attached. A signature, date and time on the COC form is required by each person who takes custody of the sample (Custodian). The Field Specialist is responsible for the COC to be completed prior to delivery of the samples the following information is provided:

PROJECT NO.	10014
PROJECT NAME/PROJECT SITE	MERCURY METER SITE INVEST./REMED.
SAMPLERS DATE	THE FIELD SPEC. SHALL SIGN AND DATE THIS FORM AS SOON AFTER THE SAMPLE IS TAKEN
SAMPLE NO.	REFER TO SEC. 4.0 FOR A COMPLETE DESCRIPTION OF THE SAMPLE NUMBERING.
DATE	SAMPLING DATE

TIME	THE TIME THE SAMPLE WAS TAKEN
PRESERVATION TECHNIQUES	FOR SOIL SAMPLES USE 4 DEG.C FOR RINSATE SAMPLE USE pH<2
REQUESTED ANALYSIS	IDENTIFY THE SAMPLE TO BE TESTED
RELINQUISHED BY	FIELD SPEC. SIGNATURE,DATE&TIME

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME/SITE NAME
10014	MERCURY METER SITE INVES./REM

SAMPLERS: *(Signature)* DATE:
FIELD SPECIALIST SIGNS HERE & DATE

Sample no.		DATE	TIME	COMP.	GRAB	TYPE AND NO. OF SAMPLE CONTAINERS	PRESERVATION TECHNIQUE	REQUESTED ANALYSIS: 4C cool	REQUESTED ANALYSIS: TCLP leachate				REMARKS
XX XX XXXXX XX		XX	XX				XX	X					

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
FIELD SPECIALIST	XX XX	ON-SITE INSPECT.			
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
ON-SITE INSPECT.	XX XX	LAB COORD.			
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks:	
LAB. COORD	XX XX	LABORATORY	XX XX		

Carrier Co: NAME OF COURIER CO. HERE Air Bill No: XXX	Carrier Phone No. (XXX) XXX-XXXX	Date Results Reported / by: *(Signature)*

NOTE: ALL X's SHOULD BE FILLED IN.

Figure 11

DRAFT

APPENDIX B

MERCURY METER SITE INVESTIGATION/REMEDIATION

EPNG METER HOUSE JSA

EL PASO
Natural Gas Company

JOB SAFETY ANALYSIS

17-Apr-90
Sec. 1

JOB TITLE/DESCRIPTION	LOCATION/DEPARTMENT	PREPARED BY: DATE: 17-Apr-90; rev - 0
Field Activities, Mercury Meter site Investigation - Remediation Project	Farmington Division	Jerry Cagle SUPERVISOR Chuck Allen

ANALYSIS BY:	REVIEWED BY: John Dolan	APPROVED BY:
Jerry Cagle	Senior Safety Representative	Miguel Blanco, Project Manager

REQUIRED AND/OR RECOMMENDED
PERSONNEL PROTECTIVE EQUIPMENT:

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
Section 1 Prerequisite:			
All personnel 1. Read and understand EPNG Safety Policy and Procedures manuel (concerning mercury safety), Project Work Plan, Q.A.P. Plan, and Health and Safety Plan.	EPNG Safety Policy and Procedures manuel, Health and Safety Plan, Work Plan, Q.A.P. Plan.		Read, and have a working knowledge of, all safety procedures and protocols detailed in EPNG Safety Policy and Procedures manuel, Work Plan, Q.A.P. Plan, and Health & Safety Plan, concerning field activities of Mercury Meter Site Investigation - Remediation Project.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
Section 2 Site Preparation:			
1. Run Technician: Open both doors and leave open.		Explosive atmosphere, mercury vapors, snakes, insects, rodents, etc..., foriegn material storage in meter house.	Secure both doors with latch, ventilate, observe meter house condition. Remove foreign objects.
2. Run Technican: Remove meter from service & blow down.		Explosive atmosphere, mercury vapors.	Blow down meter slowly, be aware of, and avoid any mercury observed.
3. Run Technician: Eliminate all ignition sources on location , & isolate meter run.	Proper valve wrench.	Back or muscle strain.	Assume proper stance when using valve wrench to close valves.
4. Run Technician: Blow down meter run.	Proper valve wrench.	Possible back injury or muscle strain. Explosive atmosphere. Ice in valves and / or lines. Hearing damage.	Use proper stance while opening valves and stay clear of blow offs. Use hearing protection.
5. Specialist: Initiate hot work permit and meter site data form's (MSDF) "Location Info" Section.	Hot work permit, meter site data form. Explosimeter.		Carefull documentation of all work performed is vital.
6A. Specialist / Helper: Set up Support Zone boundaries, vehicles, and first aid station as described in Figure 1.	Hard hat, Nomex, safety glasses, rubber boots, Ty-vek coveralls, traffic cones.	Mercury vapor and contamination, explosive atmosphere.	
6B. Helper / Specialist: Utilize proper PPE for level 'C' as defined in Table #1.	Hard hat, Nomex, safety glasses, rubber boots, Ty-vek coveralls, half or full face respirator, inner and outer rubber gloves.	Mercury vapor and contamination, heat stress, dermatitus, reduced communication ability.	Utilize work/rest periods as temperature dictates.
6C. Run Technician: Utilize proper PPE for Support Zone as defined in Table 1.	Hard hat, Nomex, safety glasses, proper footwear.	Mercury vapor and contamination, explosive atmosphere.	Run technician must remain in Support Zone at all times.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
7A. Specialist: Conduct atmospheric survey to include two mercury vapor readings at head level, and at floor level. Readings are taken 18" on each side of meter at head level and averaged; and 18" on each side of meter at floor level (2" above ground) and averaged. Ambient temperature is also recorded. Record infromation in Meter Site Data Form, in "Vapor Reading" section.	Mercury vapor analyser, temperature recorder.	Mercury vapor, mercury contamination.	Dress up to level 'C' PPE and avoid any observed mercury.
7B. Specialist: If mercury level exceeds mg/m³, stop all activities, retreat to Support Zone, contact Health & Safety Officer (Table 2), and wait for further instructions.			
8. Helper / Specialist: Conduct close visual inspection of meter, floor, meterhouse walls and footings and skids.	Level 'C' PPE, trowel.	Mercury vapors, mercury contamination.	Dress to level 'C' PPE and be cautious during inspection to minimize contamination.
9. Helper / Specialist: Collect any retrievable, visible mercury from meter house floor, walls, skids, meter, meter run. Place retrieved mercury in approved containers.	Mercury vacuum, aspirator, trowel, plastic spoon, mercury containers, portable generator.	Mercury vapors, mercury contamination.	Dress to level 'C' PPE and retrieve as much visible mercury as possible. Observe procedures for handling and transporting mercury as defined in EPNG Safety Policy and Procedures.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
Section 3 Meter House Removal			
1. Run Technician: Position hoist vehicle in support zone as shown in Figure 1.	Support truck equipped with hoist and winch.	All above ground well site equipment...wellhead, dehy, seperator, etc... Intrusion into 'D' zone with vehicle.	Run Tech. must remain in Support Zone at all times. Be aware of all above ground instal--lations. Do not back any vehicle on location without spotter outside vehicle. Adhere to zone boundaries defined in Table 1.
2. Run Technician: Deploy support jack on hoist vehicle, and telescope boom into position and pin.		Mashing of fingers or hands on telescoping beam. Possible back or muscle strains. Head injuries, tripping hazard.	Use caution when telescoping beam and pinning. Keep area clear of tripping hazards. Communicate with Specialist and Helper, noting position of boom.
3. Run Technician: Attach lifting device to safety hook. Elevate boom and position over meter house.	Hoist, lifting device illustrated in Figure 2.	Striking Specialist or Helper during boom positioning, striking meter house.	Use extreme caution while swinging boom over meter house. Helper and Specialist must be aware of boom movement at all times.
4. Specialist / Helper: Remove temperature recorder probe and secure to recorder.	12" Cresent		Dress to level 'D' PPE.
5A. Specialist: Assume position inside meter house for end-panel bolt removal.	Screwdriver or drill with socket.	Cutting or bruising hands or fingers.	Dress to level 'C' PPE. Exercise hand tool safety, wear gloves.
5B. Helper: Assume position outside meter house for end-panel bolt removal, and remove end-panel bolts and panels.	Screwdriver or drill with socket.	Cutting or bruising hands or fingers. Cutting hands or fingers on end panel (sheet metal, sharp edges).	Dress to level 'C' PPE. Exercise hand tool safety, wear gloves. Use extreme caution when handling sheet metal with sharp edges.
6. Helper / Specialist: Remove meter house footings (angle iron).		Cutting or bruising hands or fingers. Cutting hands or fingers on end panel (sheet metal, sharp edges).	Dress to level 'C' PPE. Exercise hand tool safety, wear gloves. Use extreme caution when handling sheet metal with sharp edges.
7. Helper / Specialist: Remove all soil from meter house footing.	Trowel, disposable brush.	Mercury vapors, mercury contamination.	Dress to level 'C' PPE. Use care to minimize spread of contaminated soil.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
8. Specialist: Attach lifting device strap to meter house working in conjunction with Run Technician.	Lifting device, winch line, nylon strap.	Overhead reaching, strains, etc... Head injuries by lifting device.	Communicate with Run Technician operating winch. Dress to level 'C'.
9. Specialist / Helper: Remove nails holding meter house footing to skids.	Pry bar, hammer.	Tool slippage, flying debris.	Dress to level 'C' PPE. Exercise hand tool safety, be cautious of flying debris. (Goggles may be worn)
10. Specialist / Helper: Remove meter house from skids, working in conjunction with Run Technician.	Hoist, winch, lifting device.	Mashing of hands and feet during lifting.	Dress to level 'C' PPE. Stay clear of meter house. Support by corners.
11A. Run Technician: Operate winch and lift meter house off skids, working in conjunction with Specialist and Helper.	Hoist, winch, lifting device.	Meter house hanging up while lifting, excessive winch line tension.	Run Tech. must remain in Support Zone. Use caution during winch operation, make sure meter house is free of skids.
11B. Run Technician: Swing boom and meter house.	Hoist, winch, lifting device. boom swing brake.		Release boom swing brake slowly, noting down-hill side of boom.
11C. Specialist and Helper: Steady meter house and reposition outside of work area.		Mashing hands between meter and meter house. Snagging meter with meter house.	Dress to level 'C' PPE. Guide meter house by holding corners, make sure meter house clears meter as it is pivoted.
11D. Run Technician: Lower meter house and release tension from winch line.	Hoist, winch, lifting device.	Foot injuries.	Specialist and Helper, keep feet clear of meter house while lowering.
12. Run Technician: Unpack and lay out tools and materials for skid removal.	Pry bar, hammer, 6 mil. plastic bag, strapping tape, mercury vapor analyzer, temp recorder, skilsaw, extension cord.		Run Tech. must remain in Support Zone. Keep tools out of areas where contamination may exist, or cause tripping hazards.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
Section 4 Investigation / Remediation			
1. Specialist / Helper: Set up zone boundaries as defined in Figure 1, and mark accordingly.	8 Traffic cones (orange).	Cross contamination of zones.	Dress to level 'C' PPE. Adhere to zone boundaries, 'C', 'D', Support zone, decon-area. Observe wind conditions with vehicle flag. Set-up de-con zone, upwind if possible.
2. Specialist / Helper: Lay out de-con reduction area as specified in Figure 1.	3 rinse tubs, 2 quart spray pump, 5 gal. water container, liquid soap, wet wipes, paper towels, disposable container labeled "lab pack", 12' x 12' plastic tarp.		Dress to level 'D' PPE. De-contamination equipment should be set up before investigation - remediation begins.
3. Run Technician: Lay out and assist Specialist with de-con equipment, and remediation tools.	All de-con equipment detailed in step 2, above.	Intrusion of zones, cross contamination.	Run Technician must remain in support zone.
4A. Specialist and Helper: Seperate skids and visually inspect for mercury contamination.	Pry bar, hammer.	Mercury vapor, mercury contamination.	Adhere to zone restrictions. Dress to level 'C' PPE.
4B. Specialist and Helper: Survey all sides of skids for mercury vapors.	Mercury vapor analyser, temperature recorder.	Mercury vapor, mercury contamination, Back or muscle strains.	Handle skids carefully, use proper stance. Dress to level 'C' PPE.
4C. Specialist and Helper: If skid is contaminated, cut into small pieces.	Skilsaw, electric cord, portable generator.	Hand or finger injuries, flying splinters and debris. Mercury contamination.	Dress to level 'C' PPE. Use extreme caution with skilsaw, use goggles while making cuts.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
4D. Specialist and Helper: Place contaminated skid pieces into fiberglass bag, seal with strapping tape and label "scrap metal and wood"; Meter number and location.	6 mil. plastic bags, strapping tape, marking pen.	Mercury vapor, mercury contamination.	Dress to level 'C' PPE. Place end pieces into bags carefully as not to rip bags.
4E. Specialist and Helper: Place tools used for skid removal into de-con area for later de-contamination.	Pry bar, hammer, skilsaw.	Cross contamination.	Dress to level 'C' PPE. Place contaminated tools in area where de-con will take place only.
4F. Specialist: Place bagged skids in Support zone.		Back or muscle strains, mercury contamination.	Use teamwork in lifting, use proper stance. Use care not to damage bags.
4G. Conduct mercury vapor levels and temperature in exclusion zone for observation / safety purposes.	Mercury vapor analyzer, temp recorder.	Mercury vapor, mercury contamination.	Dress to level 'C' PPE.
5. Run Technician: Un-pack and make ready, disposable soil container for soil removal.	Designated disposable soil container strapping tape, marking pen.	Zone intrusion, cross contamination.	Run Technician relay materials to workers inside Contamination Reduction Zone.
6A. Specialist and Helper: Investigate for mercury contamination by probing the soil under the meter/ orifice plate to a depth of 6"-8" inches as well as other suspected areas in exclusion zone.	Trowel, shovel, plastic spoon.	Cross contamination, mercury vapors.	Make certain that all tools used for investigation are not contaminated from previous use. Dress to level 'C' PPE.
6B. Specialist and Helper: Retrieve any recoverable mercury found during inspection, and place in proper container.	Aspirator bulb, syringe, plastic spoon, heavy duty plastic bottle.	Mercury vapors, mercury contamination.	Use only approved, labeled bottles for storing and transporting mercury. Dress to level 'C' PPE.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
7A. Specialist and Helper: Excavate meter floor area in exclusion zone until such time as no visible mercury is present. Typically in 2" lifts.	Shovels, trowels, pick or maddok, disposable container.	Mercury vapors, mercury contamination, back or muscle strains, heat stress, dermatitus.	Dress to level 'C' PPE. Use proper stance for shoveling. Work/rest periods may be needed in warm temperatures. Place soil in disposable containers located in contamination reduction zone. Use care not to contaminate this zone with excavated soil.
7B. Specialist and Helper: Excavate to a depth and area necessary to remove all contaminated soil.	Shovels, trowels, pick or maddok, disposable container.	Mercury vapors, mercury contamination, back or muscle strains, heat stress, dermatitus.	Dress to level 'C' PPE. Verification of sufficient contaminated soil removal may include vapor readings, as well as visual inspections.
7C. Specialist and Helper: Remove and place in "scrap metal and wood" disposable containers, solid materials such as concrete, metal, wood, and catalytic heaters.	Shovels, trowels, pick or mattock, disposable containers, marking pen.	Mercury vapors, mercury contamination.	Label disposable containers; lab pack - towels, ty-vek, gloves, soil - soil and mercury, liquid - drip, oil, water, and mercury, scrap metal and wood - solid materials. seal container liners with strapping tape to prevent vapor loss. Dress to level 'C' PPE.
7D. Specialist and Helper: Final screening by close examination of the excavated area to determine if all mercury has been removed.	De-contaminated trowel, shovel.		Decontaminate trowel or shovel by wiping clean with disposable towel. Rinsing with soapy water and wiping dry. Probe excavated area with trowel or shovel to verify that mercury has been removed. Dress to level 'C' PPE.
7E. NOTE* Mercury vapor levels will normally be elevated during excavation, due to airborne particles. Allow 5 - 10 minutes for dissapation, before using vapor levels as an indicator of remaining, unseen mercury.	Mercury vapor analyser.		

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
7F. Specialist: Conduct atmospheric survey in exclusion zone, and record on meter site data form. The results of this survey will determine if further remediation is required; or if exclusion zone can be eliminated.	Mercury vapor analyser, temperature recorder, meter site data form.	Mercury vapors, mercury contamination.	Throughly inspect 'C' zone visually, and with vapor analyser. If vapor levels do not exceed .050 mg/m^3, remediation is completed, mercury vapor levels in excess of .050 mg/m^3 indicate that further excavation is necessary. Dress to level 'D' PPE.
8A. Specialist and Helper: De-contaminate all tools used in remediation in de-con zone, and wrap in plastic bags.	2 wash tubs, 2 qt. spray bottle, liquid soap, paper towels, wet wipes.	Mercury contamination to personnel, and future sites.	Dress to level 'D' PPE. Wash all tools off thoroughly over wash tub with sprayer and towel. Use spray to rinse. Wipe dry with paper towel. Dispose of towels in lab-pack container. Dispose of wash and rinse water in soil container.
8B. Specialist and Helper: Perform personal decontamination assisting each other in de-con zone.	2 wash and rinse tubs, 2 qt. spray bottle with water. Paper towels, wet wipes, liquid soap.	Mercury contamination.	Wash boots with soap and water in wash tub. Use paper towels to scrub. Rinse boots in rinse tub and wipe dry. Wash and rinse outer gloves. Remove outer gloves and boots and store in plastic bags for transport. Remove tape and tyvek suit and dispose in lab-pack containers.
8C. Specialist and Helper: Remove and decontaminate respirators in de-con zone.	Seperate "respirator" wash tub, liquid soap, wet wipes, paper towels.	Personal mercury contamination.	Remove cannister from respirator, wash face piece with soap and water. Wipe dry with with paper towel. Wipe thoroughly with wet wipes and store in zip-lock bag for transport.
8D. Specialist and Helper: De-contaminate tubs, tarp, and monitor for storing.	Mercury vacuum, portable generator, paper towels, mercury vapor analyser.	Personal mercury contamination.	Wipe tubs thoroughly with paper towels and dispose. Vacuum tarp and wipe with paper towels. Use mercury vapor anlyser to assure tarp de-con.

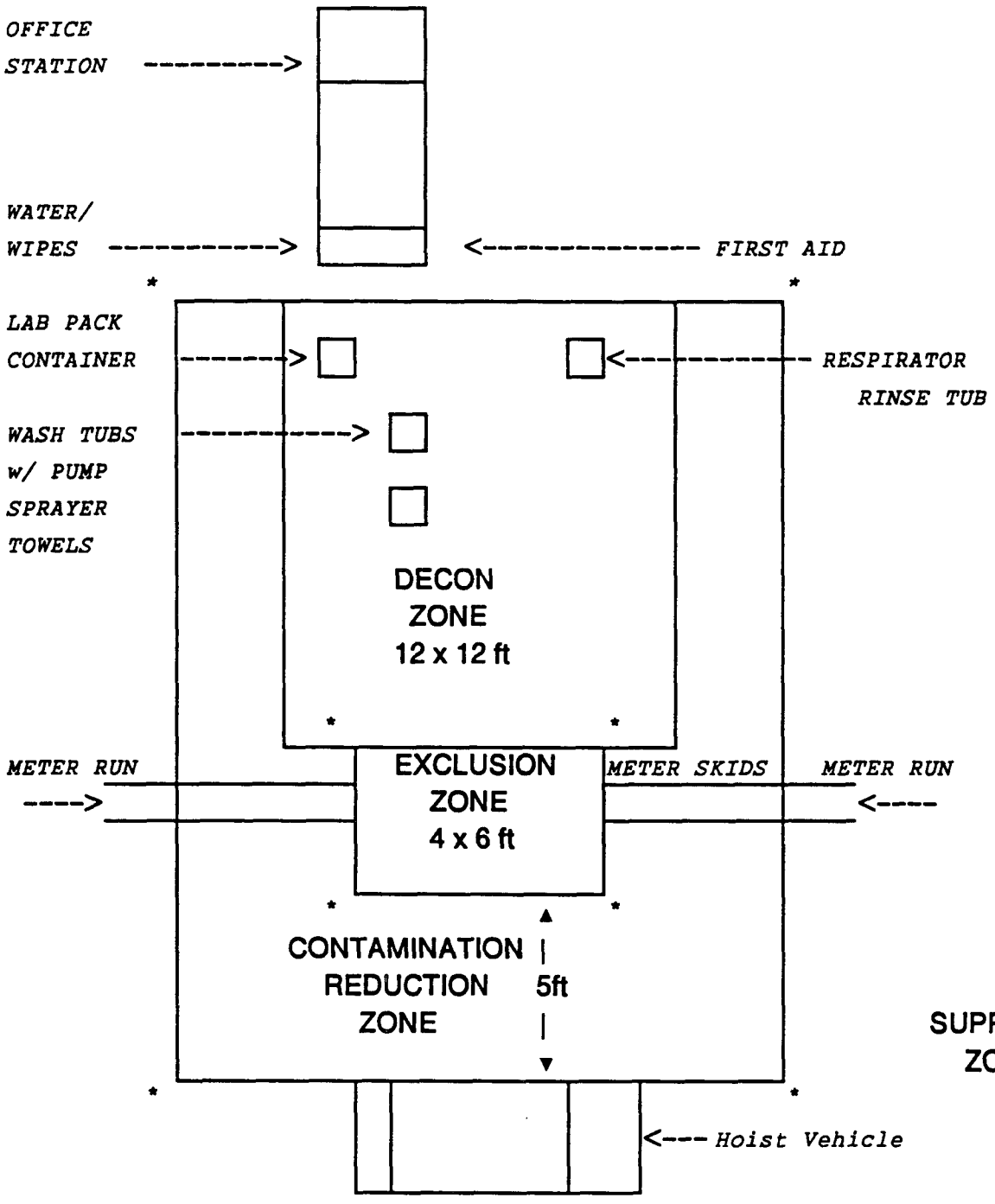
KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
8E. Run Technician, Specialist, and Helper: Fold tarp inward and store in plastic bag for transport.			A fresh pair of disposable gloves will be worn by Run Technician to assist in tarp folding and storage.
9. Specialist and Helper: Store vacuum hose in plastic bag. Remove disposable inner gloves and place in lab pack container.			Peel off gloves from inside out.
10. Specialist and Helper. Seal container liners with strapping tape and complete all container labeling.	Strapping tape, marking pen.	Mercury vapors.	Stay clear of liner tops while twisting and sealing.
11. Specialist. Remove zone markers and store for transport.			All zones have been cleared, and normal work procedures can be followed.
12. Specialist: Complete Remediation section of Site Data form.			

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
Section 5 Verification Sampling			
1. Specialist. Lay out sampling materials, initiate change of custody form (COC) described in Table 4.	Disposable gloves, 8oz sample containers with labels, plastic spoon or other soil retrieving tool that is known to be mercury free, C.O.C. form.	Cross contamination.	Wear disposable rubber gloves.
2. Run Technician and Helper. Store all tools and equipment not needed for transport. Unload materials and equipment for new skid placement.		Back or muscle strain, wood splinters.	Use care in unloading skids, use 2 workers, wear work gloves when handling skids.
3. Specialist. Obtain required samples.	Sample container, label, disposable gloves.	Broken glass.	Secure sample per QAP Officer's instructions.
4. Specialist. Fill out label and place on jar. Apply custody seal tape over jar lid. Complete COC and MSDF forms.	Ice, ice chest, zip lock bag.	Broken glass.	Sample must be kept at a maximum of 4° C. Place sample in zip-lock bag to insure label integrity prior to storage in ice chest.
5. Specialist. Dispose of utensils/gloves used for sampling in zip-lock bag.	Zip-lock bag.	Cross contamination.	
6. NOTE* The Specialist will see that sample chest has adequate ice throughout the work day to maintain 4° C. At the end of each day, Specialist will deliver samples and all documentation to the designated depository. Documentation will be sealed, and the depository will maintain a temperature of 4° C. or less at all times.	Locked refridgerator with compartments.		Depository will be secured and accessable by authorized personnel only, and be in an area unlikely for vandalism to occur. (Field offices, etc...)

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
Section 6 Mercury Containment Device Placement, and Meter House Re-Installation.			
1. Specialist assigns task to Helper and Run Technician.			
2. Prepare soil around meter house boundary for skid placement.	2 - 3" x 6" x 80" treated pine (4" x 6") 2 - 3" x 6" x 80" treated pine (4" x 6") Rake, shovel, pick, tape, measure.	Back or muscle strain, wood splinters.	Use proper lifting techniques for handling skids wear work gloves. All soil within meter house boundaries must remain inside skid area. Make sure skids are square with run.
3. Set skids in place and level. Grade area for floor pan support.	Level, shovel, hammer, skreed.		Outside soil may not be placed inside skid area without being previously sampled and approved. Make sure floor is graded to pan contour.
4. Install fiberglass floor pan, test for support.	Pre-fabricated fiberglss floor pan, tape measure.	Muscle or back strain, cuts to hands.	Two personnel carry and place floor pan. Wear workgloves. Ensure that pan is solidly supported by weight testing. Square floor pan on skids.
5. Lift meter house, using winch, and lower into place.	Hoist vehicle, winch, lifting device.	Possible slipping or dropping building,	Release boom swing brake, only enough to move meter house. Note downhill side of boom. Support meter house by corners.
6. Position meter house skids and lower into place.	Hoist vehicle, winch lifting device.	Mashing hands between meter house and meter.	Keep feet and body clear of meter house.
7. Square meter house with floor pan and skids.	Tape measure.		Position meter house squarely on skids for proper clearance.
8. Re-install end-panels, footings, and drill fiberglass pan for securing screws.	Tin snips, drill, extension cord, portable generator, drill bit, socket. End panel screws or bolts and nuts.	Severe cuts to hands and fingers on sheet metal edges.	Use extreme care while trimming end panels to fit meter run, wear heavy work gloves. Exercise power tool safety while drilling footing screw holes.
9. Install footing, securing screws, secure meter house to skids.	2" lag screws, electric drill, portable generator, extension cord, socket for drill.	Mashing hands on meter house wall, with drill torque.	Exercise power tool safety.

KEY JOB PROCESS STEPS	TOOLS/ MATERIALS USED	POTENTIAL HAZARDS: CONDITIONS OR ACTIONS WHICH COULD CAUSE AN INJURY/AFFECT HEALTH	RECOMMENDED SAFE PRACTICES: PERSONAL PROTECTIVE DEVICES: SPECIAL CLOTHING, PROCEDURES
10. Load remaining skids and pans from Helper vehicle to Run Tech. vehicle.	Floor pans, skids, etc...	Back or muscle strains.	Use two personnel for lifting and carrying skids, floor pans, etc... Wear work gloves.
11. Load containers of contaminated soil and materials into Helper's hoist truck.	Hoist, winch, lifting device.	Dropping bags, or swinging into personnel.	Set hoist boom in proper position to lift containers and swing onto bed of hoist truck.
12. Secure hoist boom in transport position and set boom brake. Load lifting device, and support jack for transport. Load all tools and equipment for transport.	Tools	Back or muscle strains.	Use proper stance for lifting. Store all tools and equipment in designated area of vehicle. Assure that all tools and equipment listed in Figure 3 have been re-loaded in Specialist's vehicle before leaving location.
13. Reload and purge meter run and place meter in service. Relight all equipment.			

Figure #1



* Designates orange traffic cone markers for zone boundaries, with caution tape placed around contamination reduction zone boundaries.

Figure 2

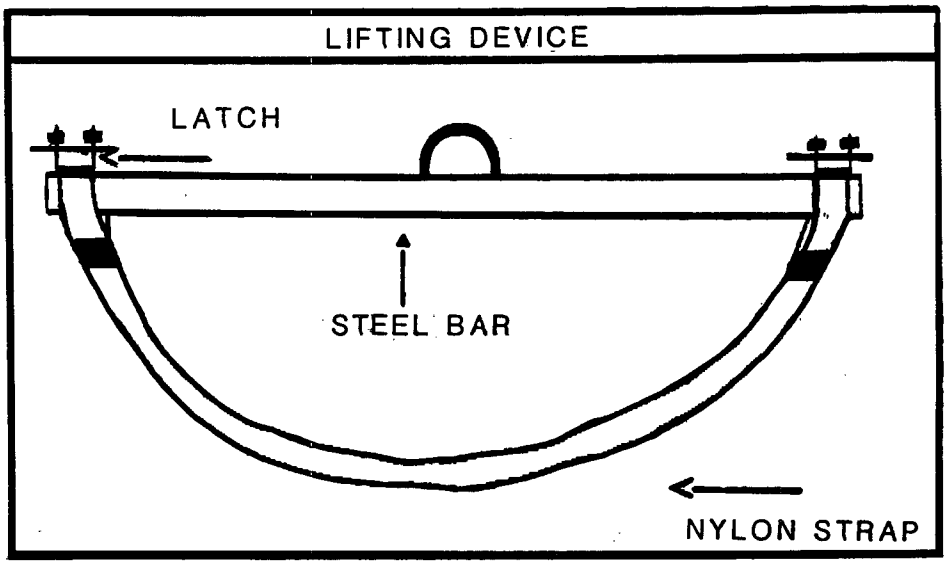


FIGURE 3 (1 of 2)

FIELD EQUIPMENT AND SUPPLY LIST

RE-USABLE P.P.E.

1.	Respirator	-----
2.	Rubber Boots	-----
3.	Outer Rubber Gloves	-----
4.	Hearing Protection	-----
5.	Goggles	-----

SAFETY EQUIPMENT

6.	First Aid Kit	-----
7.	Eye Wash Kit	-----

DECONTAMINATION EQUIPMENT

8.	2-Plastic De-Con Tubs (16"x22"x6")	-----
9.	1-Plastic De-Con Tub For Respirator	-----
10.	1-Plastic 5 Gallon Bucket	-----
11.	1-6 Gallon Water Can	-----
12.	1-10'x10' Plastic Tarp	-----
13.	6-Tarp Tie Downs	-----
14.	2-Long Handle Brushes	-----
15.	2-Boxes of Disposable Paper Towels	-----
16.	1-Box of Wet Wipes	-----
17.	2-Plastic Pump Sprayers	-----

ZONE EQUIPMENT

18.	8-Traffic Cones	-----
19.	Caution Tape	-----

INSTRUMENTS

20.	Mercury Vapor Analyzer	-----
21.	Explosimeter	-----

INVEST./REMED. EQUIPMENT

22.	Portable Generator	-----
23.	Mercury Vacuum Cleaner	-----

FIGURE 3 (2 of 2)

FIELD EQUIPMENT AND SUPPLY LIST

INVEST./REMED. TOOLS

24.	Aspirator Bulb	-----
25.	2-Shovels	-----
26.	2-Trowels	-----
27.	1-Plastic Drain Pan	-----
28.	2-Ammo Boxes	-----
29.	1-Pick/Maddox	-----
30.	Colored Sealing Tape	-----
31.	Plastic Funnel	-----
32.	Flash Light	

INVEST./REMED. CONTAINERS

33.	Contaminated Soil Container	-----
34.	Lab Pack	-----
35.	Scrap Wood & Metal Container	-----
36.	Labeled Sample Containers	-----
37.	Sample Ice Chests	-----

CONSTRUCTION TOOLS

38.	Hammer	-----
39.	Crow Bar	-----
40.	Electric Drill	-----
41.	Skill Saw	-----
42.	8" Level	-----
43.	25' Measuring Tape	-----
44.	10" Crescent	-----
45.	Tin Snips	-----
46.	2-25' Extention Cords	-----
47.	Rake	-----
48.	24" Pipewrench	-----
49.	2-3/8" Drive Sockets Size 3/8' & 5/16"	-----
50.	Skreed	-----
51.	1-Lifting Device	-----
52.	2" Lag Screws	-----

Table #1

LEVEL	Designation	PPE Requirements
C	Exclusion zone	Half or full face respirators. Ty-vek suit, rubber boots, inner & outer rubber gloves, hard hat, safety glasses/goggles.
D	Contamination reduction zone & decon zone	Ty-vek suit, rubber boots, hard hat, safety glasses/goggles, outter rubber gloves.
	Support zone	Nomex, hard hat, safety glasses, gloves, proper footwear.

TABLE 2

Date: 4/17/90

PROJECT MEMBERS

		Office Phone	Radio #
PROJECT MANAGER	Mike Blanco	505-334-9602	133 or KKF868
ESAD TASK MANGER	Mike Chintis	915-541-2839	
COMPLIANCE MANAGER	Ken Beasley	915-541-2146	
HEALTH & SAFETY OFFICERS	John Dolan	505-599-2106 326-8453(Pager)	1757
	Robert Rojas	505-599-2107 326-8526(Pager)	526
QA/QC OFFICER	Sandra Miller	505-599-2141	
FIELD OPERATIONS COORDINATOR	Chuck Allen	505-334-3818	133 or KKF868
FIELD CLERK	Tammy Vigil	505-334-3807	KKF868
FIELD INSPECTORS	Jerry Cagle	505-334-3902	438
	Kelly Prespentt	505-334-3902	1758
FIELD SPECIALIST	Danny Armenta		
	Randy Shirly		205
	Troy Wood		
	Ricky Cosby		1870
	Gene Gosnell		429
	James Armenta		321
	Joe Pat Saiz		1413

METER SITE DATA FORM Table 3 (Front)

LOCATION INFORMATION

METER CODE [ ][ ] - [ ][ ][ ] LOCATION NAME _____

DATE [ ][ ] - [ ][ ] - [ ][ ] RUN NUMBER [ ][ ]-[ ][ ]-[ ][ ]

TIME OF ARRIVAL _____ AM PM SPECIALIST _____

TIME OF DEPARTURE _____ AM PM CONTRACTOR _____

CREW NUMBER [ ][ ] RUN TECH. _____

VISITORS: _____ [ ]AUDITOR [ ]REGULATOR [ ]OPERATOR [ ]OTHER

_____ [ ]AUDITOR [ ]REGULATOR [ ]OPERATOR [ ]OTHER

_____ [ ]AUDITOR [ ]REGULATOR [ ]OPERATOR [ ]OTHER

OBSERVATIONS

METER TYPE: [ ]MERCURY [ ]EFM [ ]DRY FLOW

IS A METER HOUSE PRESENT? [ ]YES [ ]NO

FLOOR TYPE: [ ]NATURAL [ ]MANMADE

SOIL TYPE: [ ]SAND [ ]CLAY [ ]SANDSTONE

[ ]LOOSE GRAVEL [ ]LOOSE ROCK

[ ]OTHER _____

WEATHER CONDITIONS:

WIND: [ ]CALM [ ]BLOWING DUST

MOISTURE: [ ]RAINING [ ]SNOWING [ ]DRY

TEMPERATURE: _____ °F

VISIBLE MERCURY OBSERVED? [ ] YES [ ]NO

IF YES [ ]SURFACE [ ]BELOW SURFACE [ ]BOTH

VAPOR READINGS

EXPLOSIMETER READING _____ %LEL

*PRIOR TO PAN INSTALLATION

INITIAL: BREATHING ZONE: _____ MG/M³

FLOOR: _____ MG/M³

TEMPERATURE: _____ °F

*FINAL: BREATHING ZONE: _____ MG/M³

FLOOR: _____ MG/M³

TEMPERATURE: _____ °F

REMEDIATION

AMOUNT OF FREE MERCURY RECOVERED _____ POUNDS

AMOUNT OF SOIL REMOVED _____ INCHES _____ APPROXIMATE # OF lbs

NUMBER OF CONTAMINATED SKIDS [ ]1 [ ]2 [ ]3 [ ]4 [ ]NONE

OTHER ITEMS REQUIRING DISPOSAL _____

IS A RETURN VISIT REQUIRED? [ ]YES [ ]NO

SAMPLING

VERIFICATION SAMPLE# [ ][ ][ ][ ] - [ ][ ][ ][ ][ ] - [ ][ ] - [ ][ ] [ ]NOT SAMPLED

ADDITIONAL VERIFICATION SAMPLE TAKEN? [ ]YES [ ]NO

IF YES, SAMPLE#: [ ][ ] - [ ][ ] - [ ][ ][ ][ ][ ] - [ ][ ] - [ ][ ]

QA/QC SAMPLES TAKEN? [ ]YES [ ]NO

IF YES, TYPE: [ ]DUPLICATE [ ]BLANK [ ]FIELD RINSATE [ ]MATRIX SPIKE

QA/QC SAMPLE# [ ][ ][ ][ ] - [ ][ ][ ][ ][ ] - [ ][ ] - [ ][ ]

CHAIN OF CUSTODY FILLED OUT? [ ]YES [ ]NO

SAMPLE(S) LABELLED? [ ]YES [ ]NO SAMPLE(S) KEPT AT 4°C? [ ]YES [ ]NO

DECONTAMINATION

EQUIPMENT DECONTAMINATED? [ ]YES [ ]NO PERSONNEL DECONTAMINATED? [ ]YES [ ]NO

SPILL CONTROL MEASURES

WAS THE U-TUBE BAGGED? [ ]YES [ ]NO WAS A FIBERGLASS PAN INSTALLED? [ ]YES [ ]NO

COMMENTS: _____

_____

_____

CREW SIGNATURE _____ DATE _____

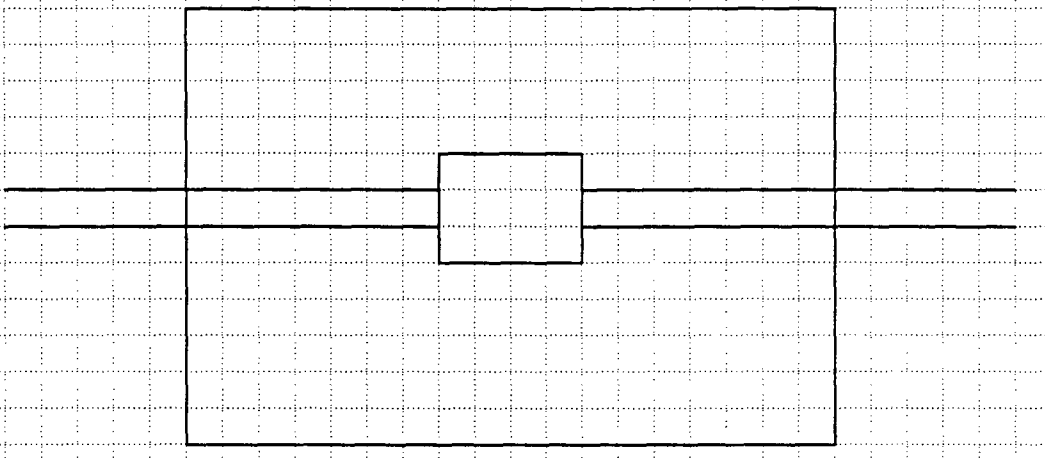
CREW SIGNATURE _____ DATE _____

CREW SIGNATURE _____ DATE _____

VALIDATION APPROVAL _____ DATE _____

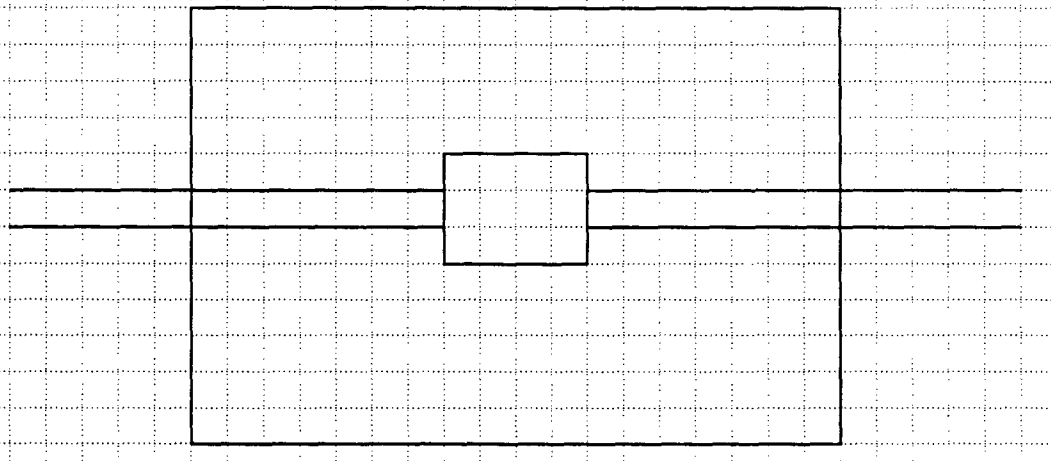
Table 3 (Back)

LOCATION OF VISIBLE MERCURY



1. Denote areas where visible mercury was found on the soil surface with an "S."
2. Denote areas where visible mercury was found below the soil surface with an "X." Areas marked with an "X" should be footnoted with approximate depths.

LOCATION WHERE SAMPLE WAS SECURED



1. Denote area where primary sample was taken with "V1."
2. If a secondary verification sample was taken, denote with "V2."

CHAIN OF CUSTODY RECORD

PROJ NO.	PROJECT NAME/SITE NAME
10014	Hg METER SITE INVEST./REMED.

SAMPLERS: (Signature) XXXXXXX XXXXXXX

DATE: XX/XX/XX

SAMPLE NO.	DATE	TIME	COMP.	GRAB	SAMPLE SOURCE AND DESCRIPTION	TYPE AND NO. OF SAMPLE CONTAINERS	PRESERVATION TECHNIQUE 4 C cool	REQUESTED ANALYSIS: TCLP Leachate				REMARKS
XX	X/X	XXXX	X	X	XX-XX-XXXXX-XX		XX	X				

EXAMPLE

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
XXXXXX XXXXX	XX XX				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks:	

Carrier Co: Air Bill No:	Carrier Phone No.	Date Results Reported / by: (Signature)

NOTE: ALL X's SHOULD BE FILLED IN BY SPECIALIST

TABLE 4 (1 of 2)

TABLE 4 (2 of 2)

Each sample container shall be labeled in the following format: