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UI-PLAN-010

2011

Distribution Integrity Management Plan (DIMP)

Los Alamos National Laboratory Natural Gas
Distribution System



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LOS ALAMOS, New Mexico 87544

Unclassified

DISTRIBUTION INTEGRITY MANAGEMENT PLAN

For LANL Natural Gas Distribution System

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1. Scope

This document is the distribution integrity management plan (Plan) for the Los Alamos National Laboratory (LANL) Natural Gas Distribution System. This Plan meets the requirements of 49 CFR Part 192, Subpart P Distribution Integrity Management Programs (DIMP) for the LANL Natural Gas Distribution System.

2. Definitions

Distribution Line	A pipeline other than a gathering or transmission line, usually downstream from a transmission line.
Excavation Damage	Any impact that results in the need to repair or replace an underground facility due to a weakening, partial or complete destruction, of the pipeline, including, but not limited to, the protective coating, lateral support, and/or cathodic protection.
Hazardous Leak	<p>A leak that represents an existing or probable hazard to persons or property and requires immediate repair or continuous action until the conditions are no longer hazardous.</p> <p>Examples include:</p> <ul style="list-style-type: none">• Escaping gas that has ignited.• Any indication of gas which has migrated into or under a building, or into a tunnel,• Any reading at the outside wall of a building, or where gas would likely migrate to an outside wall of a building,• Any reading of 80% LEL, or greater, in a confined space,• Any reading of 80% LEL, or greater in small substructures (other than gas associated substructures) from which gas would likely migrate to the outside wall of a building,• Any leak that can be seen, heard, or felt, and which is in a location that may endanger the general public or property, or• Any leak which, in the judgment of operating personnel at the scene, is regarded as an immediate hazard.
LEL	Lowest concentration (percentage) of natural gas in the air capable of producing a flash of fire in the presence of an ignition source (arc, flame, heat). Concentrations lower than LEL are 'too lean' to burn. This occurs at 5 percent.
Main	A distribution line that serves as a common source of supply for more than one service line.
Maximum Allowable Operating Pressure (MAOP)	The maximum pressure at which a pipeline or segment of a pipeline may be operated under this part. At LANL, this is typically 100 psig.
Meter	The meter that measures the transfer of gas from an operator to a point of use.
Natural Gas	A mixture of hydrocarbon gases that occurs with petroleum deposits, principally methane together with varying quantities of ethane, propane, butane, and other gases, and is used as a fuel and in the manufacture of organic compounds.
Pipe	Any pipe or tubing used in the transportation or distribution of natural gas, including pipe-type holders.
Pipeline	All parts of those physical facilities through which natural gas moves, including pipe, valves, and other appurtenance attached to pipe, metering stations, regulator stations, delivery stations, holders, and fabricated assemblies.

Service line A distribution line that transports gas from a common source of supply to an individual customer. A service line ends at the outlet of the service regulator to the customer.

Service regulator The device on a service line that controls the pressure of gas delivered from a higher pressure to the pressure provided to the customer. A service regulator may serve one customer or multiple customers through a meter header or manifold.

3. Acronyms

ADEPT	Document Management Software Used by LANL
APGA	American Pipeline and Gas Agency
CAIS	Condition Assessment Information System
CFR	Code of Federal Regulations
DIMP	Distribution Integrity Management Program
ECN	Engineering Change Notice
ESM	Engineering Standards Manual
FOD	Facility Operations Director
FSR	Facility Service Request
FY	Fiscal Year
GIS	Geographic Information System
GPTC	Gas Piping Technology Committee
LANL	Los Alamos National Laboratory
LEL	Lower Explosive Limit
MAOP	Maximum Allowable Operating Pressure
MSS	Maintenance Site Services
NMGCO	New Mexico Gas Company
PE	Polyethylene
PHMSA	Pipeline and Hazardous Materials Safety Administration
PFITS	Performance Feedback and Improvement Tracking System
PM	Preventative Maintenance
ppm	Parts per million
SHRIMP™	Simple, Handy, Risk-based Integrity Management Plan™
SIF	Security and Integrity Foundation
SME	Subject Mater Expert

TM	Tech Meter
UI	Utilities and Infrastructure
UMAP	Utilities Mapping

4. Introduction

This Plan was developed by reviewing records and interviewing LANL personnel. The records consist of the design, construction, operation and maintenance for the LANL Natural Gas Distribution System. The records system for the LANL Natural Gas Distribution System is limited, so the majority of information is based on the judgment of LANL employees; the maintenance crew, the Corrosion Specialist and the Utilities and Infrastructure (UI) Civil Team Leader. The records used in this report are: Pipeline and Hazardous Materials Safety Administration (PHMSA) 7100.1-1, Report of Main and Service Line Inspection, Natural Gas Leak Survey, Gas Leak Response Report, Gas Leak and Repair Report, and Pipe-to-Soil Recordings. The specific elements of knowledge of the infrastructure used to evaluate each threat and prioritize risks are listed in Sections 6 and 7, Threat Evaluation and Risk Prioritization respectively. This Plan addresses additional information needed and a method for gaining that data over time through normal activities.

The processes used for the initial assessment of Threat Evaluation and Risk Prioritization are the methods found in the Simple, Handy Risk-based Integrity Management Plan (SHRIMP™) software package developed by the American Pipeline and Gas Agency (APGA) Security and Integrity Foundation (SIF). SHRIMP™ uses an index model developed by the consultants and advisors of the SIF. Threat assessment is performed using questions developed by the Gas Piping Technology Company (GPTC) as modified and added to by the SHRIMP™ advisors.

This Plan is required to be reviewed every 5 years to be continually refined and improved.

Records for all piping system installed after the effective date of this Plan will be captured and retained in the UI records documentation system. Primary Utility Asbuilts are maintained by Utilities Mapping (UMAP) and additional records are maintained on the N drive. Engineering Change Notices (ECNs) are stored on the N drive under configuration management and kept up by Utilities and Infrastructure Division Office (UI-DO). Records include, at a minimum, the location where new piping and appurtenances are installed and the material of which they are constructed.

5. Knowledge of the Distribution System

5.1 Overview

The knowledge segment of the Plan provides a general overview of the LANL Natural Gas Distribution System. The areas addressed in this section are location, material, pipe size, pressures, and construction, operation and maintenance. A further summary of the LANL Natural Gas Distribution System can be found in Attachment A.

5.2 Location, Material, Pipe Size

The a Geographic Information System (GIS) location and material composition records of the LANL Natural Gas Distribution System are documented using system. A version of the location of the LANL Pipeline is available on the LANL Inside Website (<http://lanl.gov>) under LANL Primary Natural Gas Utilities in the GIS Map Index. The material and pipe size are available on the same site by selecting the identify tool and clicking on a section of pipe. PHMSA form 7100.1-1, Attachment B, provides a general overview of the LANL Natural Gas Distribution System.

5.3 Pressure

The LANL Natural Gas Distribution Pipeline is operated at 88 psi. The natural gas pressure is monitored and alarmed by LANL using pressure transducers at Tech Meter No. 1. Alarm # 1 is a high pressure transportation alarm set at 550 psig. Alarm # 2 is a low pressure transmission alarm set at 300 psig. Alarm # 3 is a high distribution pressure alarm set at 96 psig. A pressure relief valve on the outlet of Tech Meter No. 1 is set at 98 psig or 2 psig below LANL's 100 psig Maximum Allowable Operating Pressure (MAOP) and 2 psig above LANL's 96 psig high distribution pressure alarm setting.

To support Laboratory operations with low pressure gas (less than 10 psig) there are approximately 400 regulator stations at the facility locations.

5.4 Construction, Operation and Maintenance

All new pipeline construction is in accordance with the LANL Engineering Standards Manual. The LANL Specifications can be found on the LANL Engineering Standards Website (<http://engstandards.lanl.gov>) under Engineering Standards Manual, Master Specifications, and Operations & Maintenance Manual. The Engineering Standards section that applies to the LANL Natural Gas Distribution System are G10-30GEN, G30, and Z10. The pertinent sections in the Master Specifications for the LANL Natural Gas Distribution System are 33 5100 and 22 0813. In the Operations & Maintenance Manual, the 300 section is relevant for the LANL Natural Gas Distribution System. In addition to the LANL Engineering Standards Manual, information concerning operation and maintenance can be found in procedures available on Sharepoint (<http://ui.lanl.gov/Shared%20Documents/Forms/AllItems.aspx>) and a preventative maintenance program can be accessed via PassPort.

6. Threat Assessment

6.1 Overview

The following threats were evaluated on the LANL Natural Gas Distribution System covered under the scope of this Plan: Corrosion, Incorrect Operations, Equipment Malfunctions, Material, Weld or Joint Failure, Excavation Damage, Natural Forces, Other Outside Forces, and Other Threats that could threaten the integrity of the pipeline. SHRIMP™ was used to assess the threats and the results of these threat assessments are discussed in the following sections.

6.2 LANL Gas Distribution Pipeline Threat Assessment

Corrosion

Data for corrosion conditions was gained from 2005-2010 PHMSA 7100.1-1 Reports, Report of Main and Service Line Inspection Forms, Pipe-to-Soil Records, and from additional records required by 49 CFR Part 192.491.

Atmospheric Corrosion on the Entire System

Atmospheric corrosion on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Atmospheric corrosion is minimal at LANL facilities due to low humidity.

The above diagnosis was based on 22 years of SME experience on the LANL Natural Gas Distribution System and a review of existing atmospheric corrosion protection records.

Cathodic Protection/Anode Beds

All steel pipes are under cathodic protection in the LANL Natural Gas Distribution System. Cathodic protection is currently adequate based on the Pipe-to-Soil records found on the N drive under Robert Keown Natural Gas. The electrical readings for all pipes in the system meet 49 CFR Part 192 Appendix D requirements for a -100 millivolt (mV) polarization shift or a reading of -850 mV. These readings are taken in accordance with LANL Procedure UI-PROC-67-00-035-R0.

A Record of cathodic protection locations is maintained in the GIS system. In the future, this record is being expanded to contain all the cable lines from the rectifiers to the anode beds.

Cathodic protection/anode beds are a concern for the LANL Natural Gas Distribution System because some of the anode beds are nearing the end of their lifespan and some are experiencing failure. A breakdown of the anode beds and their lifespan can be seen in Attachment D.

External Corrosion on Coated, Cathodically Protected, Steel Mains and Services

External corrosion on coated, cathodically protected, steel mains and services was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Repaired leaks per mile of mains are deemed as not increasing (PHMSA 7100.1-1).
- Exposed pipe inspections have not shown an indication of corrosion problems (Report of Main and Service Line Inspections).
- Cathodic protection is adequate as demonstrated in the Pipe-to-Soil readings.

External Corrosion on Bare, Cathodically Protected, Steel Mains and Services

External corrosion on bare, cathodically protected, steel mains and services was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Repaired leaks per mile of mains are deemed as not increasing (PHMSA 7100.1-1).
- Exposed pipe inspections have not shown an indication of corrosion problems (Report of Main and Service Line Inspections).
- Cathodic protection is adequate as demonstrated in the Pipe-to-Soil readings.

External Corrosion on Cast, Wrought, Ductile Iron Mains and Services

Not Applicable – There are no known cast, wrought, or ductile iron lines in the LANL Natural Gas Distribution System.

External Corrosion on Plastic Mains and Services with Metal Fittings

Not Applicable – There are no known plastic mains or services with metal fittings in the LANL Natural Gas Distribution System.

External Corrosion on Other Metal

Not Applicable – There is no known external corrosion on other metal in the LANL Natural Gas Distribution System.

Internal Corrosion

Internal corrosion on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- LANL Natural Gas Distribution System inspections of the inside of metal pipe or coupons removed from metal pipe do not show signs of internal corrosion (Report of Main and Service Line Inspections and SME witness of coupons, sections of removed pipe, and ultrasonic thickness readings).

- Leaks caused by internal corrosion have not been found in the LANL Natural Gas Distribution System.
- The LANL Natural Gas Distribution System does not receive gas other than from a transmission pipeline that delivers only pipeline quality gas by contract.
- Liquids have not been found in LANL Natural Gas Distribution System piping.

Incorrect Operations

Data for Incorrect Operations was gained from a review with the maintenance personnel and an interview with the UI-MSS Maintenance Manager.

Incorrect Operations Due to Inadequate Procedures

Incorrect operations due to inadequate procedures were found to be non-existent from the provided data by email exchange with the maintenance foreman. Procedures are currently being reviewed as they are being updated from KSL to UI-PROC. Once the procedures are updated, they are put on a 3 year review cycle.

Incorrect Operations Due to Failure to Follow Procedures

Incorrect operations due to failure to follow procedures was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because there was only one incident of incorrect operations due to failure to follow procedures according to the provided information. More information on this failure (welder burns through pressurized gas line) can be found in the LANL Mirror, July – September 2005.

Operator Qualification Revocation

Operator qualification revocation was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because there were no operator qualification revocations according to information provided by the UI-MSS Maintenance Manager.

Drugs and/or Alcohol Abuse

LANL performs random drug tests on all employees. Drugs and/or alcohol abuse was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because there were no drugs and/or alcohol abuses according to information provided by the UI-MSS Maintenance Manager.

Equipment Malfunctions

Data on Equipment Malfunctions was taken from 2005-2010 PHMSA 7100.1-1 Reports, 2005-2009 Leak Control Survey Reports, Report of Main and Service Line Inspection Forms, an email exchange with the maintenance foreman.

Equipment Malfunctions

Equipment malfunctions on the entire system were determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Leaks are occurring or inspections indicate potential equipment malfunctions.

- System contains equipment known/prone to malfunction.

The PHMSA 7100.1-1 reports from 2005-2009 reveal trends in gas leaks occurring on and/or around threaded fittings, valves, regulators/relief valves, and meters (Attachment K).

Threaded Fitting Gas Leaks

The majority of gas leaks on the LANL Gas Distribution System are due to threaded fittings. This kind of leak occurs with temperature changes and only results in a class 3 leak. Threaded fitting leaks are not a concern.

Equipment Malfunctions Due to Valves

Equipment malfunctions due to failing valves were determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Valves sometimes stick open or closed.
- Malfunctioning of these valves can be due to failing seals, gaskets, o-rings, packing, etc.
- The problem with these valves can result in gas leaking outside of the pipeline.

The majority of gas leaks associated with valves are due to grease lubrication, but there are an unknown number of valve failures (valves that needed to be replaced). Documentation was not able to be reasonably located by the UI-MSS Work Execution Manager to determine the severity of leaks due to valves.

Equipment Malfunctions Due to Regulators/relief Valves

Equipment malfunctions due to failing regulators/relief valves was determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Failures can be related to set point drift.
- The equipment malfunctioning can be due to failing seals, gaskets, o-rings, packing, boots, etc.
- Equipment failure could cause system pressure to exceed the MAOP.

The UI Civil Team Leader has received a lot of notifications of regulator failure throughout LANL. Regulators have a life span of approximately 20 years. A preventative maintenance (PM) program to replace 20 regulators annually was in place up until about 3 years ago. Without this PM in place, regulators are reaching the end of their lifespan and failing.

Equipment Malfunctions Due to Meters

Equipment malfunctions due to other failing equipment was determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- UI-MSS does not have trained instrumentation personnel who can repair meters.
- Full access to readings is unavailable from TM # 1 & 4.
- The CGTG meter cannot be remotely accessed.

Tech Meter #1 is not currently in use and is not a threat to the LANL System. If the meter was put back in use, it would need to be evaluated. TM #1 & 4 readings on the NMGCO flow computers are used for custody transfer from NMGCO transmission system are owned by NMGCO. LANL has measuring element, pressure and temperature transducers that are connected to LANL flow computers for flow measurement verification.

Material, Weld or Joint Failure

Data for Materials, Welds and Joints was gained from 2005-2009 PHMSA 7100.1-1 Reports and email exchange with the maintenance foreman.

Material, Weld or Joint

Material, weld or joint on the entire system was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Manufacturing defects on pipe or non-pipe components have not been experienced.
- Failures due to workmanship defects have rarely been experienced.

There were 2 weld failures discovered in the past 5 years, but there is not documentation to assess the concern with one of them. At TA-11, there is a fusion weld pipe which is not allowed by our standards, but it is not a concern where it is located and is currently in the process of being cut and capped. One material concern we have is polyethylene (PE) pipe within 20 feet of steam and condensate lines. This threat is addressed in Other Concerns.

Material, Weld or Joint Due to Manufacturing Defects

Material, weld or joint due to manufacturing defects were deemed non-existent due to data provided by email exchange with the maintenance foreman.

Material, Weld or Joint Due to Workmanship Defects

Material, weld or joint due to workmanship defects assessment was deemed non-existent due to data provided by email exchange with the maintenance foreman.

Material, Weld or Joint Due to Known Problem Materials

Material, weld or joint due to known problem materials assessment was deemed non-existent due to data provided by email exchange with the maintenance foreman.

Excavation Damage

Data for Excavation Damage was gained from 2005-2009 PHMSA 7100.1-1 Reports, information from UMAP, and interviews with the Corrosion Specialist and the U&I Systems Engineer Civil Engineer Manager.

Excavation Damage Due to Concentrated Damages or Tickets

Excavation damage due to concentrated damages or tickets was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Excavation damages are distributed across the entire system. Over the past 5 years, we have only had 4 excavation damages to the LANL Natural Gas Distribution Pipeline.
- Excavations are controlled using a strict permitting system. Procedures UI-PROC-70-10-0030R0 and Tier 3 Compliments Procedure P101-17 are followed when excavations occur. To file an excavation permit, the requester goes to <https://weblogin.lanl.gov/login.php?referer=HTTP://esh-id.lanl.gov/excavation/request.asp> and fills out the given paperwork. Ability to file a permit is limited to people who have had the required training.

Excavation Damage Due to the LANL Crew or Contractor Damages

Excavation damage due to the LANL crew or contractor damages was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Excavation damage has rarely occurred (3 damages in 2005 and 1 in 2010)
- Excavations are controlled using a strict permitting system. Procedures UI-PROC-70-10-0030R0 and Tier 3 Compliments Procedure P101-17 are followed when excavations occur. To file an excavation permit, the requester goes to <https://weblogin.lanl.gov/login.php?referer=HTTP://esh-id.lanl.gov/excavation/request.asp> and fills out the given paperwork. Ability to file a permit is limited to people who have had the required training.

Excavation Damage Due to Third Party Damages

Excavation damage due to third party damages was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Excavation damages have not occurred due to third parties during the past few years.
- There are very few third party excavations.

Excavation Damage Due to Blasting Damage

Excavation damage due to blasting damage was determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Portions of the system are not located where excavation in the area of pipeline would require the use of explosives.
- Portions of the system are not in known areas of blasting or demolition activity, such as rock quarries or coal mining,
- Damage has not occurred due to blasting. Blasting has not occurred in the past 5 years in the vicinity of natural gas lines.

Natural Forces

Data for Natural Forces on the Entire System was gained from 2005-2009 PHMSA 7100.1-1 Reports and conversations with the U&I Systems Engineer Civil Engineer Manager.

Natural forces on the entire system were determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Seismic activity is predicted to reach a magnitude 6 in the future which could cause significant damage to the LANL Natural Gas Distribution System.

Seismic Activity

Although no previous natural forces have affected the integrity of the gas distribution pipeline, precautions should be taken in the event of earthquakes.

Other Outside Forces

Data for Natural Forces on the Entire System was gained from 2005-2010 PHMSA 7100.1-1 Reports and conversations with the Corrosion Specialist.

Other outside forces on the entire system were determined not to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Leaks, failures or damages are deemed as not averaging one or more per year.
- There have been no Other Outside Force damages reported in PHMSA 7100.1-1 for the past 5 years.

Other Threats

Data for Other Threats on the Entire System was gathered from UMAP, an interview with the maintenance crew, and conversations with the Corrosion Specialist and the U&I Systems Engineer Civil Engineer Manager.

Other threats on the system warrant further consideration for additional action beyond code compliance or current system practice because they may cause damage in the future. The other threats are as follows:

- PE Gas Lines within 20 Feet of Steam Lines
- Documentation and Record Maintenance
- Un-locatable Pipe/Unknown Material
- Instrumentation

PE Gas Lines within 20 Feet of Steam Lines

PE Gas Lines within 20 Feet of Steam Lines was determined to be a threat warranting further consideration for additional action because:

- LANL Engineering Standards states that PE gas lines are required to be a minimum of 20 feet from steam and condensate lines.
- There are 8 sections of PE gas pipeline within 20 feet of steam and condensate lines (Attachment F).

The possible consequences of a failure of this portion due to the indicated threat would be higher than for the LANL Gas Distribution Pipeline system in general because:

- Steam/condensate line leaks may cause thermal damage to PE gas lines within 20 feet.

Documentation and Record Maintenance

Documentation and Record Maintenance was determined to be a threat warranting further consideration for additional action beyond code compliance or current system practice because:

- Documentation is poor and records are difficult to find (Appendix G).

The possible consequences of a failure of this portion due to the indicated threat are:

- Lack of ability to see clear history of pipeline decreases personnel's ability to trend problem areas on the pipeline.

Un-locatable Pipe/ Unknown Material

Un-locatable Pipe/Unknown Material Other was determined to be a threat warranting further consideration for additional action because:

- Having un-locatable pipe and/or unknown pipe material is non-compliant with LANL Engineering Standards.
- TA 16-204 has unknown pipe material 16.5 feet long.
- There are 14 sections of un-locatable pipe throughout the LANL Gas Distribution Pipeline system.

The possible consequences of a failure of this portion due to the indicated threat would be higher than for the LANL Gas Distribution Pipeline system in general because:

- Excavators would not know where the pipeline was and excavation damage would increase.

Instrumentation

Instrumentation used to determine gas leaks was determined to be a threat warranting further consideration for additional action beyond current system practice because:

- The current instruments used to detect gas leaks are not sensitive enough to detect all gas leaks.

The possible consequences of a failure of this portion due to the indicated threat are:

- A leak would not be located as quickly.
- If a leak was detected earlier damage to the pipeline may be avoided.

7. Risk Evaluation and Prioritization

7.1 Overview

From the results of Section 6 (Threat Assessment), a risk analysis matrix was developed. This section lists the results of the matrix, beginning with the highest priority. Further explanation of the risk analysis matrix can be found in Attachment G.

7.2 LANL Gas Distribution Pipeline Section Risk Ranking

1 PE Gas Lines within 20 Feet of Steam Lines

Description: PE gas lines within 20 feet of steam and condensate lines are not installed in compliance with LANL Engineering Standards and pose a risk to the integrity of the LANL Natural Gas Distribution System

Ranked here, in part, for the following reasons:

- There are 8 sections of PE pipe within 20 feet of steam and condensate lines and there have been problems associated with these lines in the past.
- Safety of LANL personnel is a moderate concern when PE gas lines are within 20 feet of steam and condensate lines.
- Loss of service is probable with lines in this condition due to temperature/pressure de-rating. (Attachment H)

2 Documentation and Record Maintenance

Description: Documentation is lacking for the LANL Natural Gas Distribution System. Records were requested from the maintenance personnel and they were unable to recover the records in a timely manner. The records are in multiple storehouses in varying states. Because attaining a complete set of records is nearly impossible, there is no current possibility of assessing whether the documentation is adequate.

Ranked here, in part, for the following reasons:

- There is not a trail of paperwork that can be followed to confirm the gas leaks reported to PHMSA on Form 7100.1-1.
- Documentation has become unreliable within the last 5 years and is likely to deteriorate in the future.
- Records are required by 49 CFR 192.303 and LANL UI Procedures (Attachment I).

3 Un-Locatable Pipe/Unknown Material

Description: The LANL Natural Gas Distribution System contains 14 sections of un-locatable pipe and 1 section of unknown pipe material.

Ranked here, in part, for the following reasons:

- Un-locatable pipe on the LANL Natural Gas Distribution System does not comply with 49 CFR 192.321 (e) for PE pipe.
- Excavation damage may increase when pipe is un-locatable.
- There are 9 sections of un-locatable PE pipe.
- There are 4 sections of un-locatable steel pipe.
- There is 1 section of unknown pipe material that is also un-locatable.

4 Instrumentation

Description: Existing leak survey instrumentation is not able to locate gas leaks when gas in air ratio is at 10 ppm.

Ranked here, in part, for the following reasons:

- Safety concerns to LANL personnel are increased by lack of sensitivity in instrumentation
- Costs may increase in repairs because leaks are detected later.

5 Equipment Malfunctions due to Regulators/Relief Valves

Description: Regulators are approaching the end of their design life.

Ranked here, in part, for the following reasons:

- Maintenance and costs increase as regulators operate even further beyond their design life.
- Safety concerns for LANL personnel increase due to increased regulator failure.
- There are a number of regulators that are failing on a somewhat regular basis.

6 Cathodic Protection/Anode Beds

Description: External cathodic protection to protect steel pipe in the LANL Natural Gas Distribution System.

Ranked here, in part, for the following reasons:

- If cathodic protection were to fail, pipeline damage would increase at an increasing rate over time.
- Cathodic protection is a 49 CFR 192 Subpart I requirement.
- Cost would increase exponentially if cathodic protection is not maintained.
- The likelihood of cathodic protection/anode beds failing is moderate.

7 **Seismic Activity**

Description: The predicted largest earthquake in Los Alamos, NM is estimated to be at a magnitude of 6.

Ranked here, in part, for the following reasons:

- A seismic event is not very likely to occur within the next 5 years.
- A magnitude 6 earthquake would cause significant damage to the LANL Natural Gas Distribution System and put LANL personnel in danger.
- DOE Order 420.1B requires for seismic design implementation on all new nuclear government facilities.

8 **Equipment Malfunctions due to Valves**

Description: Valves in the LANL Natural Gas Distribution System occasionally do not operate properly and decrease the integrity of the distribution pipeline.

Ranked here, in part, for the following reasons:

- The likelihood of valve failure is low.
- Valves that are difficult to open or close decrease the safe operation of the LANL Natural Gas Distribution System.

9 **Equipment Malfunctions due to Meters**

Description: Meters on the LANL Natural Gas Distribution System do not operate properly because of inadequate funding.

Ranked here, in part, for the following reasons:

- If meters fail, the effect on the operations of the LANL Natural Gas Distribution System is low.
- Without operating meters, LANL is unable to verify the meter readings from NMGCO.

8. Risk Based Mandatory Actions

8.1 Overview

Most risks are currently addressed based on their leak classifications, as can be seen in Attachment J. This Plan has developed additional/accelerated actions to protect the LANL Natural Gas Distribution System from threats determined in this Plan. Each priority risk from section 7 (Threat Assessment) is mentioned below with LANL's part in alleviating/eliminating the threat.

8.2 Risk Based Mandatory Actions

1 PE Gas Lines within 20 Feet of Steam Lines

To address the threat of PE Gas Lines within 20 Feet of Steam Lines in the LANL Natural Gas Distribution Pipeline, the following actions will be taken:

- A temperature study on PE lines will be included in a project budget for FY 2012 to assess the condition of PE pipes within 20 feet of steam lines.
- From the temperature monitoring data, a plan will be developed by the end of FY 2012 to address this threat.

2 Documentation and Record Maintenance

To address the threat of Documentation and Record Maintenance, LANL will take the following actions:

- Engineering and MSS will develop a program to address inadequate transmittal of work documentation from MSS to Engineering by the end of FY 2012.

3 Un-Locatable Pipe/Unknown Material

To address the threat of Un-locatable Pipe/Unknown Material, LANL will take the following actions:

- Install line markers on PE and steel pipe from FY 2012 through FY 2014.
- Dig up and verify pipe material for the section of pipe where the material is unknown in FY 2012.

4 Instrumentation

To address the threat of Instrumentation, LANL will take the following action:

- MSS will purchase natural gas survey instrumentation that is capable of sensing a minimum of 1 ppm natural gas in air, is intrinsically safe and portable in FY 2012.

5 Equipment Malfunctions due to Regulators/Relief Valves

To address the threat of Equipment Malfunctions due to Regulators/Relief Valves, LANL will take the following actions:

- A regulator/relief valve condition assessment survey will be completed to determine the order and time frame of regulator station replacements which will begin in FY 2012.

- The regulator/relief valve condition assessment survey will be completed in FY 2011.

6 Cathodic Protection/Anode Beds

To address the threat of Cathodic Protection/Anode Beds, LANL will take the following actions:

- Replace 4 anode beds in the next 4 years beginning in FY 2012 based on an engineering evaluation and anode bed performance.

7 Seismic Activity

To address the threat of Seismic Activity, LANL will take the following actions:

- A project scope and cost estimate for seismic shut-off valves for TM#1 and TM#4 will be completed in FY 2011.
- Funding for Engineering will be provided in FY 2014 and funding for Installation will be provided in FY 2015.
- Create an abnormal event plan to add to the Gas Emergency and Curtailment Plan (UI-PROC-67-00-170-R1) addressing seismic considerations for LANL Natural Gas Distribution System in FY 2011.

8 Equipment Malfunctions due to Valves

To address the threat of Equipment Malfunctions due to Valves, LANL will take the following action:

- Repair or replace problem valves as the problems occur as part of corrective maintenance (current action).

9 Equipment Malfunctions due to Meters

To address the threat of Equipment Malfunctions due to Meters, LANL will take the following action:

- There is currently a Facility Service Request to MSS to repair the flow computer at TM#4.
- MSS will reconfigure TM#1 flow computer in FY 2012 to change the measurement calculation from an AGA 8 to an AGA 3 calculation.

9. Measure Performance, Monitor Results, and Evaluate Effectiveness

9.1 Overview

Section 9.2, Risk Based Mandatory Performance Measures, lists the performance measures that will be tracked and describes the part of LANL Natural Gas Distribution System to which each mandatory performance measure applies to evaluate the effectiveness of the additional measures taken to address risks as described in section 8 (Additional Measures to Address Risks) of this Plan.

9.2 Risk Based Mandatory Performance Measures

1 PE Gas Lines within 20 Feet of Steam Lines

To determine if this additional/accelerated action is effective at removing the threat from PE Gas Lines within 20 Feet of Steam Lines, LANL will conduct the following performance measure:

- A temperature study on PE lines will be tracked in PFITS (Performance Feedback and Improvement Tracking System).
- The plan developed from the temperature study will be entered into PFITS by the end of FY 2012.

2 Documentation and Record Maintenance

To determine if this additional/accelerated action is effective at reducing the threat of Documentation and Record Maintenance, LANL will conduct the following performance measure:

- Assess the effectiveness of the program to document LANL Natural Gas Distribution System records one year prior to the re-evaluation of the plan.

3 Un-Locatable Pipe/Unknown Material

To determine if this additional/accelerated action is effective at reducing the threat of Un-Locatable Pipe/Unknown Material, LANL will conduct the following performance measure:

- Track implementation of the proposed corrective action in PFITS.

4 Instrumentation

To determine if this additional/accelerated action is effective at reducing the threat from Instrumentation, LANL will conduct the following performance measure:

- Track the purchase of leak detection instrumentation in PFITS.

5 Equipment Malfunctions due to Regulators/Relief Valves

To determine if this additional/accelerated action is effective at reducing the threat from Equipment Malfunctions due to Regulators/Relief Valves, LANL will conduct the following performance measure:

- Track the completion of the regulator/relief valve survey and include results of the survey in the CAIS database.
- Track the frequency of regulator/relief valve failures annually.

6 Cathodic Protection/Anode Beds

To determine if this additional/accelerated action is effective at reducing the threat from Cathodic Protection/Anode Beds, LANL will conduct the following performance measures:

- Track the replacement of anode beds in FY 2012, FY 2013, FY 2014, and FY 2015 and update the CAIS database.

7 Seismic Activity

To determine if this additional/accelerated action is effective at reducing the threat from Seismic Activity, LANL will conduct the following performance measure:

- Track the project scope and cost estimate development for seismic shut-off valves at TM#1 and TM#4.
- Track the implementation of an abnormal event plan in the Gas Emergency and Curtailment Plan (UI-PROC-67-00-170-R1).

8 Equipment Malfunctions due to Valves

To determine if this additional/accelerated action is effective at reducing the threat from Equipment Malfunctions due to Valves, LANL will conduct the following performance measure:

- Track the frequency of valve failures and whether they were repaired or replaced.

9 Equipment Malfunctions due to Meters

To address the threat of Equipment Malfunctions due to Meters, LANL will take the following action:

- Track the repair to the flow computer at TM#4 in the FSR database.
- Track the measurement calculation update of the flow computer at TM#1 in the FSR database.

10. Periodic Evaluation and Improvement

Every year the results of the performance measures listed in Section 9, *Measure Performance, Monitor Results, and Evaluate Effectiveness*, will be reviewed by the individuals listed in Attachment C, *List of Responsibilities*.

Trends in each of the performance measures listed in the previous section will be reviewed. If any performance measure indicates that any of the additional action taken is not effective in reducing the risk it is intended to address, LANL will consider implementing additional actions to address that risk.

LANL will conduct a complete re-evaluation of this Plan every 5 years. LANL will consider the results of the performance monitoring in these evaluations.

11. Reporting

The following will be submitted annually to PHMSA as part of the Distribution Annual Report (Form F7100.1-1).

COMPRESSION COUPLING FAILURES

LANL will track and report information relating to each hazardous leak resulting from the failure of a compression coupling. This information will include, at a minimum:

- Location of the failure in the system
- Nominal pipe size
- Material type
- Nature of failure including any contribution of local pipeline environment
- Coupling manufacturer
- Lot number
- Date of manufacture
- Any other information that can be found in markings on the failed coupling

These will be sent to the PHMSA Information Resource Manager as part of the Distribution Annual Report (Form F7100.1-1) by any one of the following:

- Through the online electronic reporting system available at PHMSA's home page at <http://phmsa.dot.gov>
- Via facsimile to (202) 493-2311
- Via mail to:

PHMSA--Information Resource Manager
U.S. Department of Transportation-East Building
1200 New Jersey Avenue, SE
Washington, DC 20590

The results of DIMP will be provided as requested by the Federal and State Regulators.

In addition to the above reports, LANL keeps track of all the PM procedures performed or deferred.

12. Record Keeping

The following records must be maintained for ten years.

1. This Plan
2. Records of data required to be collected to calculate performance measures listed in *Section 9, Measure Performance, Monitor Results, and Evaluate Effectiveness*
3. Records of compression coupling failures

In addition to the above records, LANL keeps track of all the PM procedures performed or deferred.

A. LANL Natural Gas Distribution System Description

Natural Gas Source

Natural gas supply to Los Alamos National Laboratory (LANL) is from New Mexico's San Juan Basin where natural gas is produced from conventional and coal seam gas wells. Natural gas is provided by a Defense Energy Support Center (DESC) contractor who will purchase natural gas on the "spot" market from pipelines in the San Juan Basin as nominated by LANL on a monthly basis.

The New Mexico Gas Company (NMGCO) provides natural gas transportation to LANL through a transportation agreement between Department of Energy (DOE) and NMGCO. The DESC contractor will supply natural gas to receipt points in the PNM system. The NMGCO system is looped to Los Alamos with a western loop from the Cuba area and an eastern loop from Santa Fe. However, the eastern loop does not have sufficient capacity to supply LANL during winter time conditions.

The volume of gas flowing to LANL in the 12" diameter NMGCO gas line can supply sufficient gas quantities to meet LANL's current Maximum Daily Quantity (MDQ) of 12,000 Decatherm (Dth) firm transportation requirements. Normal operating pressure of the NMGCO gas line is approximately 470 psig. Custody transfer to LANL occurs at two border stations; Tech Area Meter No. 1 and Tech Area Meter No. 4. The normal capacities of the border stations measured in standard cubic foot per hour (scfh) are:

- Tech Meter No. 1 = 1,000,000 scfh
- Tech Meter No. 4 = 1,200,000 scfh

NMGCO Tech Meter No. 1

NMGCO delivers natural gas to LANL at Tech Meter No. 1 located near TA-03 Building 525 via a buried 8" NMGCO line. The gas pressure is reduced from approximately 470 psig to 200 psig using two parallel-configured pressure reducing valves (prvs). Natural gas is measured by NMGCO using a single 8" orifice meter run. After measurement, the gas pressure is further reduced from 200 psig to 88 psig again using two parallel-configured prvs before entering the LANL natural gas distribution system. For added system reliability, Tech Meter No. 1 is equipped with a 4" bypass manually actuated valve that is normally closed.

NMGCO Tech Meter No. 4

In addition to the natural gas delivery at Tech Meter No. 1 NMGCO also delivers natural gas to LANL at Tech Meter No. 4. The gas is measured by PNM using a single 6" turbine meter run prior to the gas pressure being reduced from approximately 470 psig to 88 psig using a single 3" working monitor regulating station. Tech Meter No. 4 is the only Border Station serving LANL that is not equipped with a bypass line.

LANL NATURAL GAS DISTRIBUTION SYSTEM

Natural gas pressure is monitored and alarmed by LANL using pressure transducers at Tech Meter No. 1. Alarm # 1 is a high pressure transportation alarm set at 550 psig. Alarm # 2 is a low pressure transmission alarm set at 300 psig. Alarm # 3 is a high distribution pressure alarm set at 96 psig. A pressure relief valve on the outlet of Tech Meter No. 1 is set at 98 psig or 2 psig below LANL's 100 psig Maximum Allowable Operating Pressure (MAOP) and 2 psig above LANL's 96 psig high distribution pressure alarm setting.

There are approximately 50 miles of natural gas mains in the LANL natural gas distribution system. In the distribution system there are 38.89 miles of steel lines and 10.5 miles of polyethylene lines. To support customers with low pressure gas (less than 10 psig) there are approximately 400 regulator stations at the customer locations.



U.S. Department of Transportation
 Pipeline and Hazardous Materials
 Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 2010

INITIAL REPORT X
 SUPPLEMENTAL REPORT

PART A - OPERATOR INFORMATION

DOT USE ONLY

1. NAME OF OPERATOR
LANL UTILITIES AND INFRASTRUCTURE

3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER
/ 3 / 1 / 0 / 6 / 9 /

2. LOCATION OF OFFICE WHERE ADDITIONAL
 INFORMATION MAY BE OBTAINED
TA-03-0481
 Number and Street
P.O. Box 1663
 City and County
Los Alamos, NM 87544
 State and Zip Code

4. HEADQUARTERS NAME & ADDRESS, IF DIFFERENT

 Number and Street

 City and County

 State and Zip Code

5. STATE IN WHICH SYSTEM OPERATES: N / M / (provide a separate report for each state in which system operates)

PART B - SYSTEM DESCRIPTION

Report miles of main and number of services in system at end of year.

1. GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTIL E IRON	COPPER	OTHER	OTHER	TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN			3.31	34.81	10.39						48.51
NO. OF SERVICES				216	147						363

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL		9.25	20.83	4.19	3.85		38.12
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		2.91	4.54	2.94			10.39
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS	0.00	12.15	25.37	37.53	3.85		48.51

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

AVERAGE SERVICE LENGTH _____ FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL		133	80	2	0	1	216
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		76	66	5	0	0	147
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS		209	146	7	0	1	363

4. MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION

	UN-KNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-PRESENT	TOTAL
MILES OF MAIN		0	4.73	10.27	12.09	4.79	5.04	7.66	3.91	0.01	48.51
NUMBER OF SERVICES			3	25	32	52	142	73	36		363

PART C - TOTAL LEAKS ELIMINATED/REPAIRED DURING YEAR

CAUSE OF LEAK	PART C - TOTAL LEAKS ELIMINATED/REPAIRED DURING YEAR	
	Mains	Services
CORROSION	0	1
NATURAL FORCES	0	0
EXCAVATION	0	1
OTHER OUTSIDE FORCE DAMAGE	0	0
MATERIAL OR WELDS	0	1
EQUIPMENT	0	0
OPERATIONS	0	0
OTHER		25
NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR <u>20</u>		

PART D - TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED FOR REPAIR

<p>28</p>

PART E - PERCENT OF UNACCOUNTED FOR GAS

Unaccounted for gas as a percent of total input for the 12 months ending June 30 of the reporting year.

[(Purchased gas + produced gas) minus (customer use + company use + appropriate adjustments)] divided by (purchased gas + produced gas) equals percent unaccounted for.

Input for year ending 6/30 0 %.

PART F - ADDITIONAL INFORMATION

Empty box for additional information.

PART G - PREPARER AND AUTHORIZED SIGNATURE

Robert A. Keown, Corrosion Specialist
(type or print) Preparer's Name and Title

1-(505)-665-5959
Area Code and Telephone Number

Keown_robert_a@lanl.gov
Preparer's email address

1-(505)-665-6636
Area Code and Facsimile Number

Robert A. Keown, Corrosion Specialist
Name and Title of Person Signing

1-(505)-665-5959
Area Code and Telephone Number


Authorized Signature



U.S. Department of Transportation
 Pipeline and Hazardous Materials
 Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 2009

INITIAL REPORT
 SUPPLEMENTAL REPORT

PART A - OPERATOR INFORMATION

DOT USE ONLY

1. NAME OF OPERATOR
LANL UTILITIES AND INFRASTRUCTURE

3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER
 / 3 / 1 / 0 / 6 / 9 /

2. LOCATION OF OFFICE WHERE ADDITIONAL INFORMATION MAY BE OBTAINED
TA-03-0481
 Number and Street
P.O. Box 1663
 City and County
Los Alamos, NM 87544
 State and Zip Code

4. HEADQUARTERS NAME & ADDRESS, IF DIFFERENT

 Number and Street

 City and County

 State and Zip Code

5. STATE IN WHICH SYSTEM OPERATES: N / M / (provide a separate report for each state in which system operates)

PART B - SYSTEM DESCRIPTION

Report miles of main and number of services in system at end of year.

1. GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTIL E IRON	COPPER	OTHER	OTHER	TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN			3.31	35.41	10.56						49.28
NO. OF SERVICES				236	151						387

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL		9.80	20.83	4.20	3.90		38.73
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		3.04	4.57	2.94			10.55
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS	0.00	12.84	25.40	7.14	3.90		49.28

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

AVERAGE SERVICE LENGTH _____ FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL		146	86	3	0	1	236
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		89	59	3	0	0	151
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS		235	145	6	0	1	387



U.S. Department of Transportation
 Pipeline and Hazardous Materials
 Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 2008

INITIAL REPORT X
 SUPPLEMENTAL REPORT

PART A - OPERATOR INFORMATION

DOT USE ONLY

1. NAME OF OPERATOR
LANL UTILITIES AND INFRASTRUCTURE

3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER
/ 3 / 1 / 0 / 6 / 9 /

2. LOCATION OF OFFICE WHERE ADDITIONAL
 INFORMATION MAY BE OBTAINED
TA-03-0481
 Number and Street
P.O. Box 1663
 City and County
Los Alamos, NM 87544
 State and Zip Code

4. HEADQUARTERS NAME & ADDRESS, IF DIFFERENT

 Number and Street

 City and County

 State and Zip Code

5. STATE IN WHICH SYSTEM OPERATES: N / M / (provide a separate report for each state in which system operates)

PART B - SYSTEM DESCRIPTION

Report miles of main and number of services in system at end of year.

1. GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTIL E IRON	COPPER	OTHER	OTHER	TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN			3.3	35.59	10.46						49.35
NO. OF SERVICES				239	169						408

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL		9.96	20.86	4.12	3.95		38.89
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		2.35	5.17	2.94			10.46
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS	0.00	12.31	26.03	7.61	3.95		49.35

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

AVERAGE SERVICE LENGTH _____ FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL		144	92	2	0	1	239
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		96	71	2	0	0	169
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS		240	163	4	0	1	408


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4. MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION										
	UN-KNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	TOTAL
MILES OF MAIN		0	5.00	10.36	12.09	4.82	5.44	7.78	3.86	49.35
NUMBER OF SERVICES			5	22	35	54	158	85	49	408

PART C - TOTAL LEAKS ELIMINATED/REPAIRED DURING YEAR			PART D - TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED FOR REPAIR	
CAUSE OF LEAK			<div style="border: 1px solid black; padding: 5px; width: 100px; margin: 0 auto;">25</div>	
	Mains	Services		
CORROSION		2	PART E - PERCENT OF UNACCOUNTED FOR GAS Unaccounted for gas as a percent of total input for the 12 months ending June 30 of the reporting year. [(Purchased gas + produced gas) minus (customer use + company use + appropriate adjustments)] divided by (purchased gas + produced gas) equals percent unaccounted for. Input for year ending 6/30 <u>0</u> %.	
NATURAL FORCES				
EXCAVATION				
OTHER OUTSIDE FORCE DAMAGE				
MATERIAL OR WELDS	1			
EQUIPMENT				
OPERATIONS			Input for year ending 6/30 <u>0</u> %.	
OTHER		22		
NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR <u>7</u>				

PART F - ADDITIONAL INFORMATION

PART G - PREPARER AND AUTHORIZED SIGNATURE

<u>Robert A. Keown, Corrosion Specialist</u> (type or print) Preparer's Name and Title	<u>1-(505)-665-5269</u> Area Code and Telephone Number
<u>Keown robert a@lanl.gov</u> Preparer's email address	<u>1-(505)-665-5424</u> Area Code and Facsimile Number
<u>Robert A. Keown, Corrosion Specialist</u> Name and Title of Person Signing	<u>1-(505)-665-5269</u> Area Code and Telephone Number
 Authorized Signature	



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 2007
GAS DISTRIBUTION SYSTEM

INITIAL REPORT
SUPPLEMENTAL REPORT

PART A - OPERATOR INFORMATION

DOT USE ONLY

1. NAME OF OPERATOR
LANL/Utilities and Infrastructure

2. LOCATION OF OFFICE WHERE ADDITIONAL INFORMATION MAY BE OBTAINED
TA-03-0481
Number and Street
P.O. Box 80
City and County
Los Alamos, NM 87544
State and Zip Code

3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER
/ 3 / 1 / 0 / 6 / 9 /

4. HEADQUARTERS NAME & ADDRESS, IF DIFFERENT

Number and Street

City and County

State and Zip Code

5. STATE IN WHICH SYSTEM OPERATES: N / M / (provide a separate report for each state in which system operates)

PART B - SYSTEM DESCRIPTION

Report miles of main and number of services in system at end of year.

1. GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	OTHER	TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN			3.53	35.91	10.46						49.90
NO. OF SERVICES										408	408

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL		9.96	20.86	4.67	3.95		39.44
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		2.35	5.17	2.94			10.46
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS	0.00	12.31	26.03	7.61	3.95		49.90

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

AVERAGE SERVICE LENGTH 60' FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL		144	92	2	0	1	239
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		96	71	2	0	0	169
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS		240	163	4	0	1	408



U.S. Department of Transportation
 Pipeline and Hazardous Materials
 Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 2006

INITIAL REPORT
 SUPPLEMENTAL REPORT

PART A - OPERATOR INFORMATION

DOT USE ONLY

1. NAME OF OPERATOR
KSL

2. LOCATION OF OFFICE WHERE ADDITIONAL
 INFORMATION MAY BE OBTAINED
PO Box 50 TA-3-481
 Number and Street
Los Alamos
 City and County
New Mexico 87544
 State and Zip Code

3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER
/ 3 / 1 / 0 / 6 / 9 /

4. HEADQUARTERS NAME & ADDRESS, IF DIFFERENT

 Number and Street

 City and County

 State and Zip Code

5. STATE IN WHICH SYSTEM OPERATES: N/M / (provide a separate report for each state in which system operates)

PART B - SYSTEM DESCRIPTION

Report miles of main and number of services in system at end of year.

1. GENERAL

	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	OTHER	TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN			3.53	35.91	10.46						49.90
NO. OF SERVICES										390	390

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL		9.96	20.86	4.67	3.95		39.44
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		2.35	5.17	2.94			10.46
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS	0.00	12.31	26.03	7.61	3.95		49.90

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR

AVERAGE SERVICE LENGTH _____ FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL		135	92	2	0	1	230
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		91	67	2	0	0	160
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS		226	159	4	0	1	390

4. MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION										
	UN-KNOWN	PRE-1940	1940-1949	1950-1959	1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	TOTAL
MILES OF MAIN		0	5.00	10.36	12.09	4.84	5.97	7.78	3.86	49.9
NUMBER OF SERVICES		0	5	22	35	55	159	81	42	390
PART C - TOTAL LEAKS ELIMINATED/REPAIRED DURING YEAR					PART D - TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED FOR REPAIR					
CAUSE OF LEAK		Mains		Services		40				
CORROSION	0	0								
NATURAL FORCES	0	0								
EXCAVATION	0	0								
OTHER OUTSIDE FORCE DAMAGE	1	0								
MATERIAL OR WELDS	1	0								
EQUIPMENT	0	0								
OPERATIONS	0	0								
OTHER	12	26								
NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR <u>6</u>					PART E - PERCENT OF UNACCOUNTED FOR GAS Unaccounted for gas as a percent of total input for the 12 months ending June 30 of the reporting year. [(Purchased gas + produced gas) minus (customer use + company use + appropriate adjustments)] divided by (purchased gas + produced gas) equals percent unaccounted for. Input for year ending 6/30 _____ %.					
PART F - ADDITIONAL INFORMATION										
PART G - PREPARER AND AUTHORIZED SIGNATURE										
Robert A. Keown, System Engineer					505-665-5959					
(type or print) Preparer's Name and Title					Area Code and Telephone Number					
Keown_robert_a@lanl.gov					505-665-6636					
Preparer's email address					Area Code and Facsimile Number					
Robert A. Keown, System Engineer					505-665-5959					
Name and Title of Person Signing					Area Code and Telephone Number					
Authorized Signature										



U.S. Department of Transportation
 Pipeline and Hazardous Materials
 Safety Administration

ANNUAL REPORT FOR CALENDAR YEAR 2005 ___
 GAS DISTRIBUTION SYSTEM

INITIAL REPORT
 SUPPLEMENTAL REPORT X

PART A - OPERATOR INFORMATION	DOT USE ONLY
1. NAME OF OPERATOR _____	3. OPERATOR'S 5 DIGIT IDENTIFICATION NUMBER / 3 / 1 / 0 / 6 / 9 /
2. LOCATION OF OFFICE WHERE ADDITIONAL INFORMATION MAY BE OBTAINED KSL _____ Number and Street TA-3-223 Po Box 80 _____ City and County Los Alamos---Los Alamos _____ State and Zip Code New Mexico, 87544	4. HEADQUARTERS NAME & ADDRESS, IF DIFFERENT _____ Number and Street _____ City and County _____ State and Zip Code
5. STATE IN WHICH SYSTEM OPERATES: N ___ / M ___ / (provide a separate report for each state in which system operates)	

PART B - SYSTEM DESCRIPTION Report miles of main and number of services in system at end of year.

1. GENERAL


	STEEL				PLASTIC	CAST/ WROUGHT IRON	DUCTILE IRON	COPPER	OTHER	OTHER	TOTAL
	UNPROTECTED		CATHODICALLY PROTECTED								
	BARE	COATED	BARE	COATED							
MILES OF MAIN			3.8	46.19	9.16						59.16
NO. OF SERVICES				236	131				23		390

2. MILES OF MAINS IN SYSTEM AT END OF YEAR

MATERIAL	UNKNOWN	2" OR LESS	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8" THRU 12"	OVER 12"	TOTAL
STEEL	0.07	10.5	19.0	5.2	3.8	0	38.7
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		3.7	3.6	2.94	0	0	9.64
3. ABS							
OTHER							
OTHER							
SYSTEM TOTALS	0.07	13.6	22.6	8.14	3.8	0	59.16

3. NUMBER OF SERVICES IN SYSTEM AT END OF YEAR AVERAGE SERVICE LENGTH 50 FEET

MATERIAL	UNKNOWN	1" OR LESS	OVER 1" THRU 2"	OVER 2" THRU 4"	OVER 4" THRU 8"	OVER 8"	TOTAL
STEEL		122	104	8	1	1	236
DUCTILE IRON							
COPPER							
CAST/WROUGHT IRON							
PLASTIC							
1. PVC							
2. PE		79	50	2			131
3. ABS							
OTHER unknown	3	8	11	1			23
OTHER							
SYSTEM TOTALS	3	209	165	11	1	1	390

4. MILES OF MAIN AND NUMBER OF SERVICES BY DECADE OF INSTALLATION										
	UN- KNOWN	PRE- 1940	1940- 1949	1950- 1959	1960- 1969	1970- 1979	1980- 1989	1990- 1999	2000- 2009	TOTAL
MILES OF MAIN	2.5	0	5.84	12.13	11.57	5.90	7.11	10.11	4.00	59.16
NUMBER OF SERVICES										
PART C - TOTAL LEAKS ELIMINATED/REPAIRED DURING YEAR					PART D - TOTAL NUMBER OF LEAKS ON FEDERAL LAND REPAIRED OR SCHEDULED FOR REPAIR					
CAUSE OF LEAK			Mains	Services	<u>37</u>					
CORROSION			0	0						
NATURAL FORCES			0	0						
EXCAVATION			0	0						
OTHER OUTSIDE FORCE DAMAGE			0	0						
MATERIAL OR WELDS			0	0						
EQUIPMENT			0	0						
OPERATIONS			0	0						
OTHER			14	23						
NUMBER OF KNOWN SYSTEM LEAKS AT END OF YEAR SCHEDULED FOR REPAIR <u>27</u>					PART E - PERCENT OF UNACCOUNTED FOR GAS					
					Unaccounted for gas as a percent of total input for the 12 months ending June 30 of the reporting year. [(Purchased gas + produced gas) minus (customer use + company use + appropriate adjustments)] divided by (purchased gas + produced gas) equals percent unaccounted for. Input for year ending 6/30 <u>N/A</u> %.					
PART F - ADDITIONAL INFORMATION										
PART G - PREPARER AND AUTHORIZED SIGNATURE										
Robert Keown, Corrosion Specialist (type or print) Preparer's Name and Title					505-665-5269 Area Code and Telephone Number					
keown_Robert_a@lanl.gov Preparer's email address					505-665-5424 Area Code and Facsimile Number					
Robert Keown, Corrosion Specialist Name and Title of Person Signing					505-665-5269 Area Code and Telephone Number					
 _____ Authorized Signature										

C. List of Responsibilities

Responsibilities for the LANL Natural Gas Distribution System are shared between 3 groups: Operations, Engineering, and Maintenance. A general description of each group's responsibilities is listed below.

UI Operations -

The purpose of UI Operations is to ensure that UI owned facilities and utility systems are operated safely, securely, and compliantly. Each of these facilities and utility systems are the responsibility of the Facility Operations Director. The engineering and maintenance sections are deployed to the FOD. The FOD assures that there is adequate funding to keep the facilities and utility systems in good condition with adequate resources.

UI Engineering (ES-UI) -

UI Engineering Services (ES UI) develops, maintains, and applies a diverse set of engineering capabilities to provide innovative engineering solutions that enable the UI FOD to operate efficiently and effectively. All modifications are developed, approved, inspected and accepted for the FOD by UI Engineering Services.

UI Maintenance (MSS-UI)-

The maintenance group does the physical work required to keep the LANL Natural Gas Distribution System in proper working condition. The maintenance group is responsible for stewardship of FOD's maintenance program, deployed support for facility and programmatic equipment maintenance, and teaming oversight of subcontractors providing maintenance and other services.

Each group has a unique and critical role in the smooth operation of the LANL Natural Gas Distribution System

D. Cathodic Protection Bed Life

Average life of a Cathodic Protection Bed is approximately 25 years in low resistivity soil (100 Ohm centimeter or less). Here at LANL soil resistivity is much higher lengthening the life of Cathodic Protection Beds (40,000 Ohm centimeter or more).

Formula for coming up with bed life:

$$(\text{Anode Weight}) / (.25 \text{ Loss per Year}) / (\text{Rectifier Amperage}) = (\text{Bed Life}) \times (.75 \text{ Safety Factor})$$

YEAR INSTALLED	NUMBER	READINGS	LIFE IN YEARS	REPLACE IN YEARS
2010	G-29	10.0V 3.0A	63 years	62
1978	G-28	50.0V 3.0A	63 years	32 ***
1991	G-27	50.0V 9.0A	21 years	2 **
2003	G-25	61.0V 3.0A	63 years	56
1994	G-24	36.0V 6.0A	32 years	16
1978	G-23	26.0V 4.0A	47 years	15
1999	G-22	56.0V 6.0 A	32 years	21
2003	G-21	55.0V 3.0A	63 years	56
1993	G-20	58.0V 8.0A	24 years	7
2002	G-18	67.0V 1.0A	189 years	181
1978	G-14	34.0V 3.0A	63 years	32
1988	G-13	16.0V 8.0A	24 years	2 **
1994	G-11	62.0V 3.0A	63 years	47
1978	G-6	46.0V 4.0A	47 years	15 ***
2006	G-39	19.0V 3.0A	63 years	59
2004	G-40	63.0V 1.0A	189 years	183
2004	G-41	43.0V 2.0A	95 years	89

Life of Cathodic Protection Beds depend on amperage settings on rectifier units which normally change as beds get older and protected structures need more amperage to stay under protection.

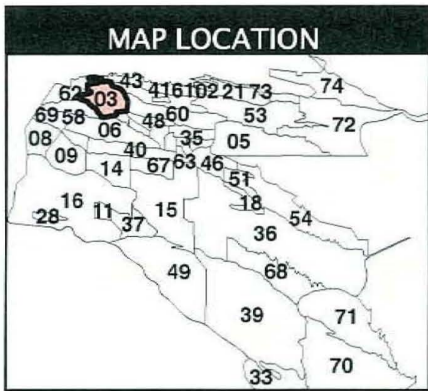
*Bench Mark Bed – Newest

**Beds needing to be replaced in the next 2 years.

***Cathodic Protection Bed showing signs of failure.

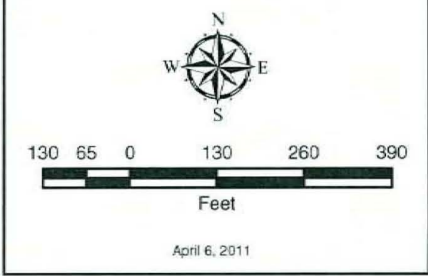
E. PE Gas Line Crossings

The following 5 drawings depict the location and length of PE lines within 20' of steam lines



LEGEND

- GAS FEATURES**
- Point of Concern
 - STEAM LINE
 - GAS LINE W/20' BUFFER
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - SURFACE PARKING LOT
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - SECURITY FENCE
 - LANDSCAPE



PE GAS LINE CROSSINGS

LOS ALAMOS NATIONAL LABORATORY



Key Map

Unclassified

CLASSIFICATION: U
REVIEWER: [Signature]
DATE: 4/6/2011

PE GAS LINE CROSSINGS

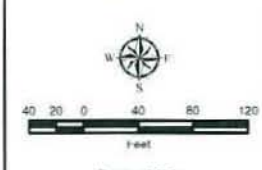


LEGEND

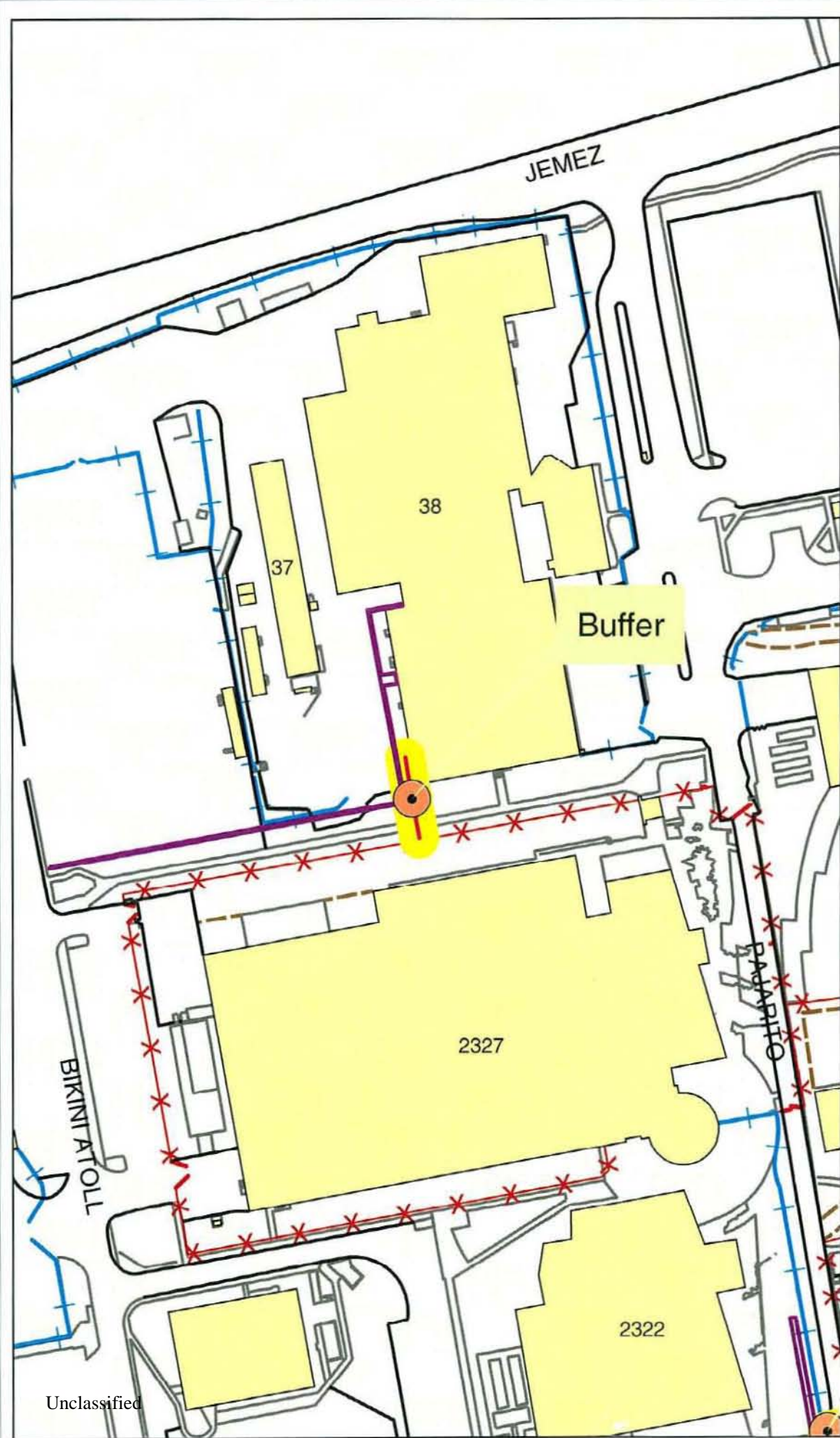
- GAS FEATURES**
- Point of Concern
 - STEAM LINE
 - GAS LINE W/20' BUFFER

MISCELLANEOUS FEATURES

- DOE PROPERTY
- SURFACE PARKING LOT
- BUILDINGS
- PAVED ROADS
- INDUSTRIAL FENCE
- SECURITY FENCE
- LANDSCAPE



SHEET 2



Unclassified



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REVIEWER: *[Signature]*
DATE: 12/16/2010

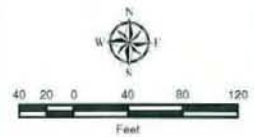
PE GAS
LINE CROSSINGS



LEGEND

- GAS FEATURES**
- Point of Concern
 - STEAM LINE
 - GAS LINE W/20' BUFFER

- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - SURFACE PARKING LOT
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - SECURITY FENCE
 - LANDSCAPE

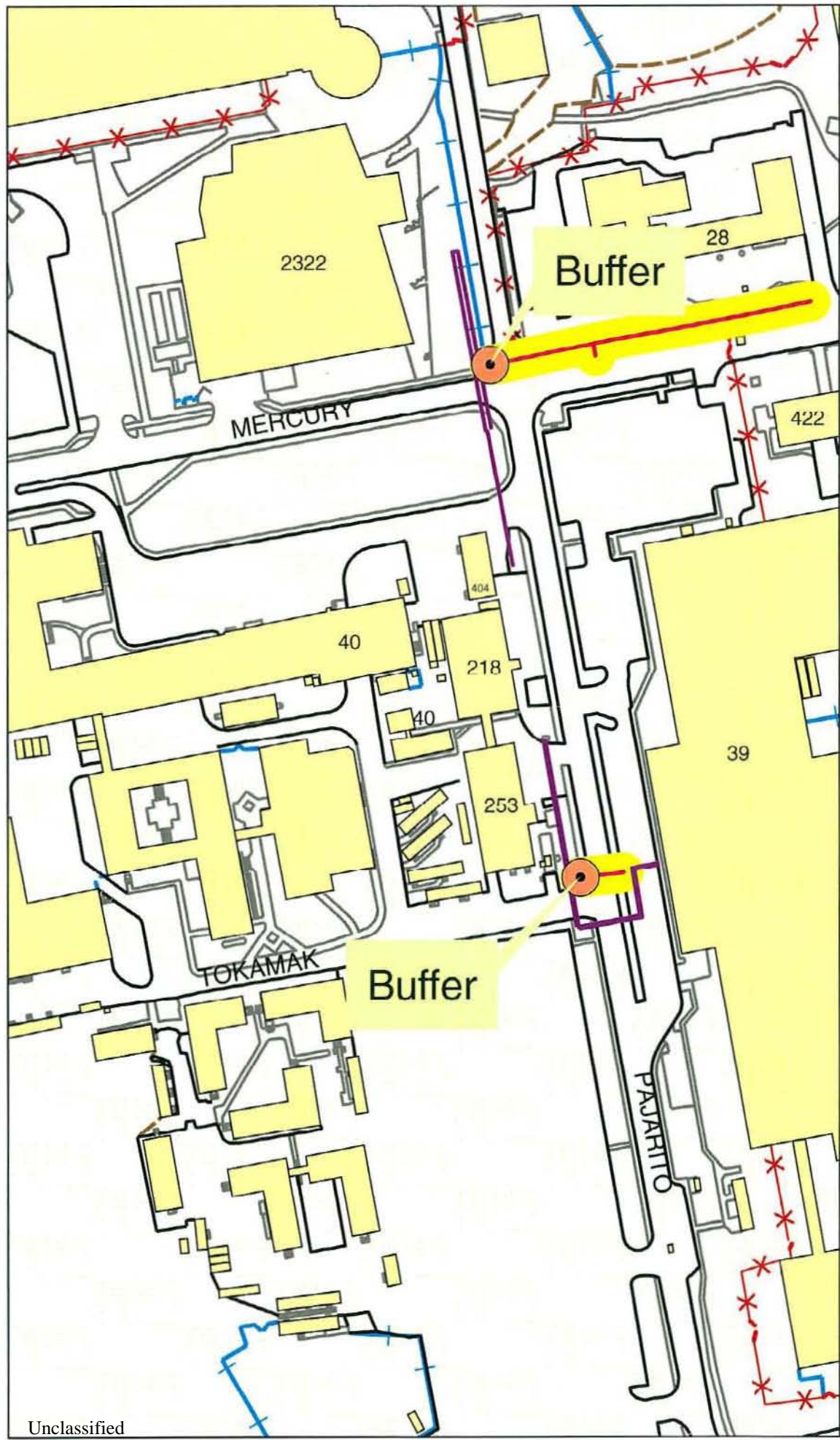


December 15, 2010

SHEET 3



CLASSIFICATION: U
REVIEWER: [Signature]
DATE: 12/16/2010



PE GAS
LINE CROSSINGS

MAP LOCATION



LEGEND

- GAS FEATURES**
- Point of Concern
 - STEAM LINE
 - GAS LINE W/20' BUFFER

MISCELLANEOUS FEATURES

- DOE PROPERTY
- SURFACE PARKING LOT
- BUILDINGS
- PAVED ROADS
- INDUSTRIAL FENCE
- SECURITY FENCE
- LANDSCAPE



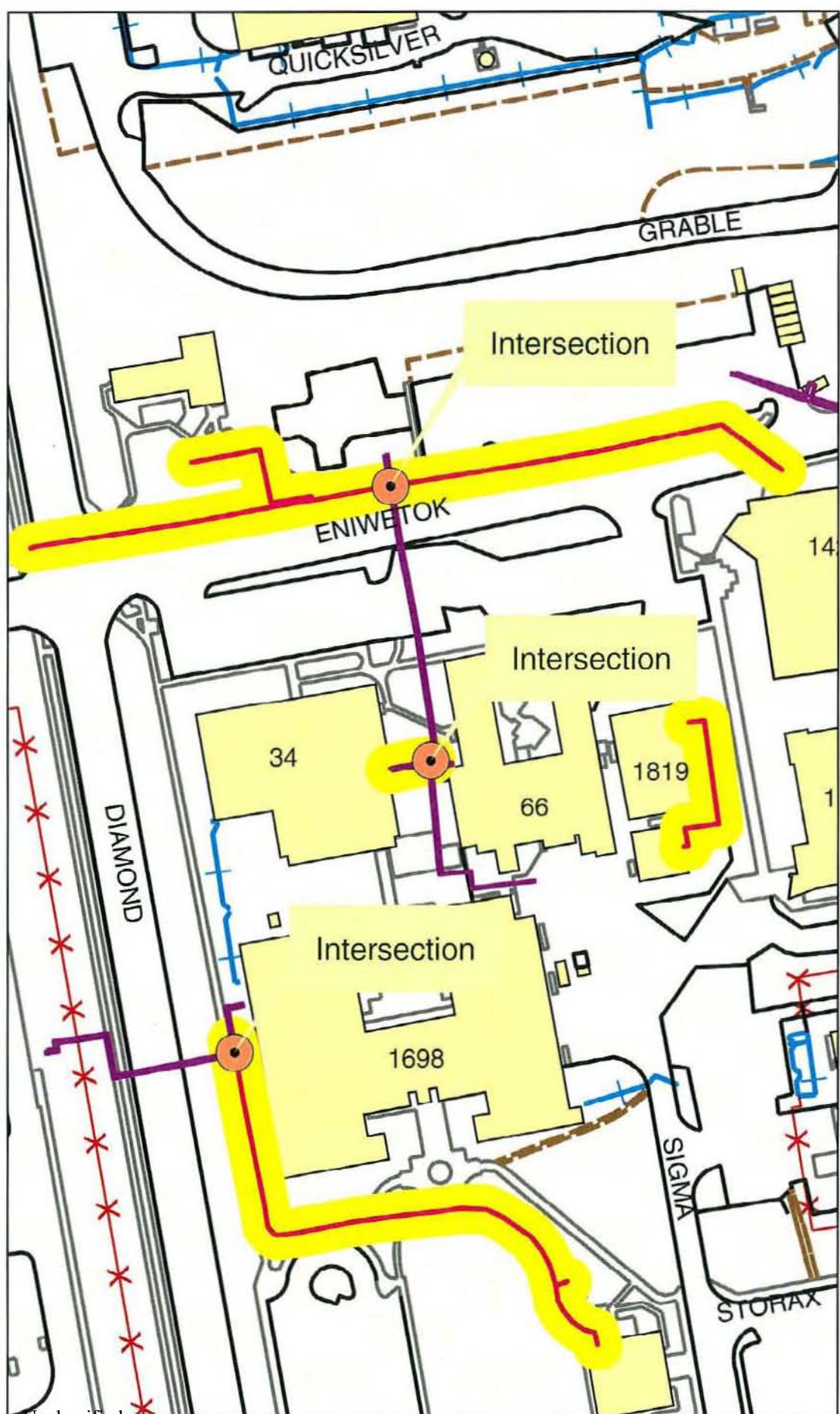
December 16, 2010

SHEET 4



CLASSIFICATION: U
REVIEWER: *[Signature]*
DATE: 12/16/2010

U11.020



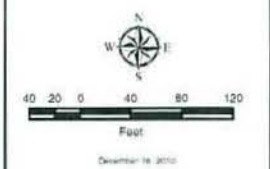
Unclassified

PE GAS LINE CROSSINGS



LEGEND

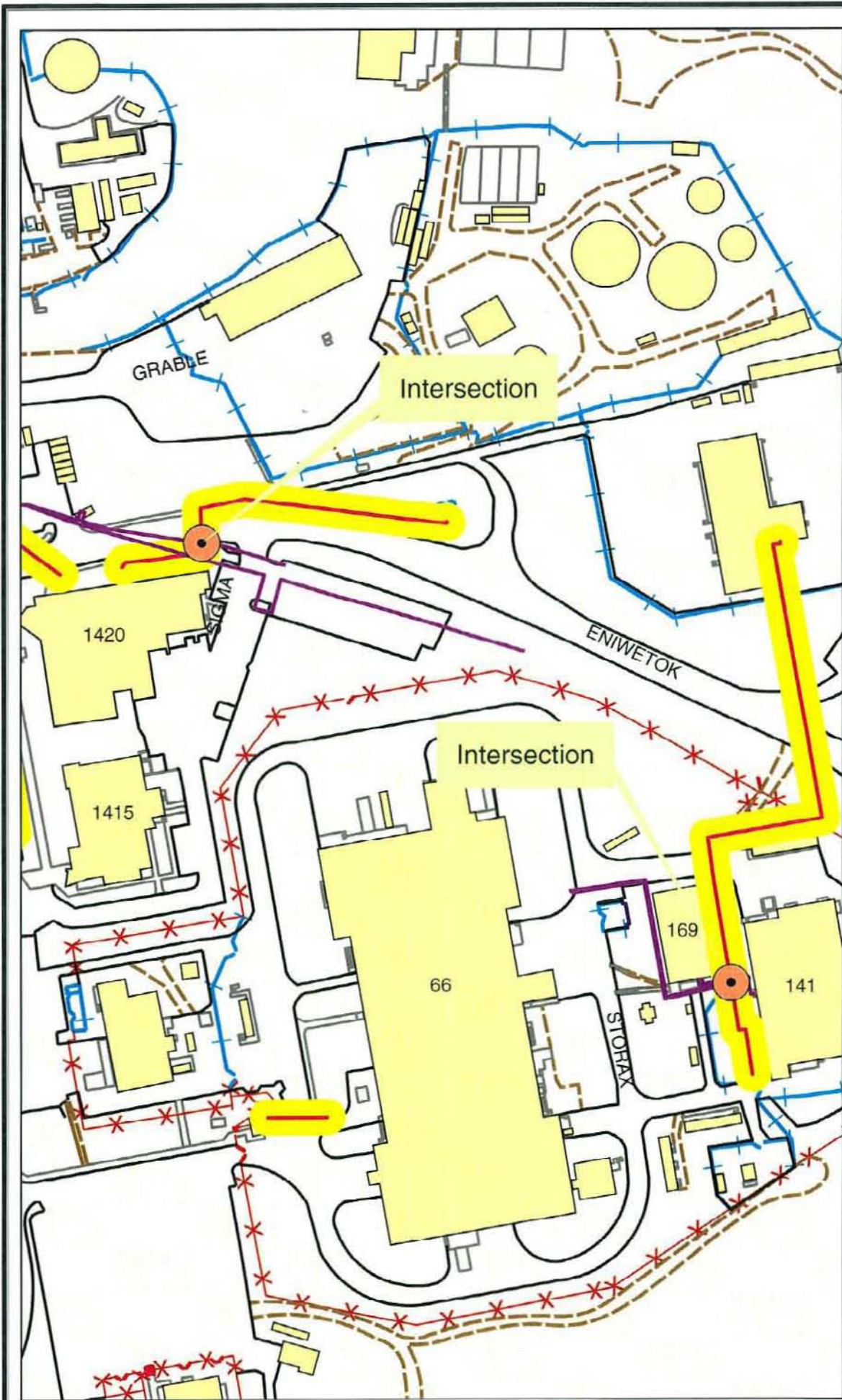
- GAS FEATURES**
- Point of Concern
 - STEAM LINE
 - GAS LINE W/20' BUFFER
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - SURFACE PARKING LOT
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - SECURITY FENCE
 - LANDSCAPE

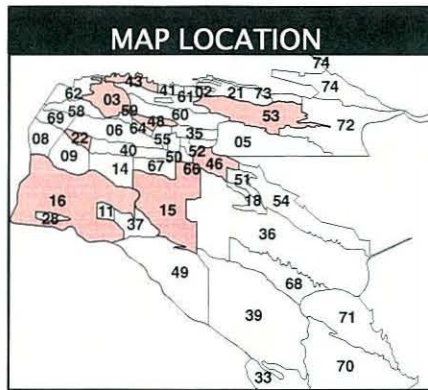


SHEET 5

UTILITIES AND
INSTITUTIONAL
FACILITIES

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DATE: 12/16/2010





LEGEND

GAS FEATURES

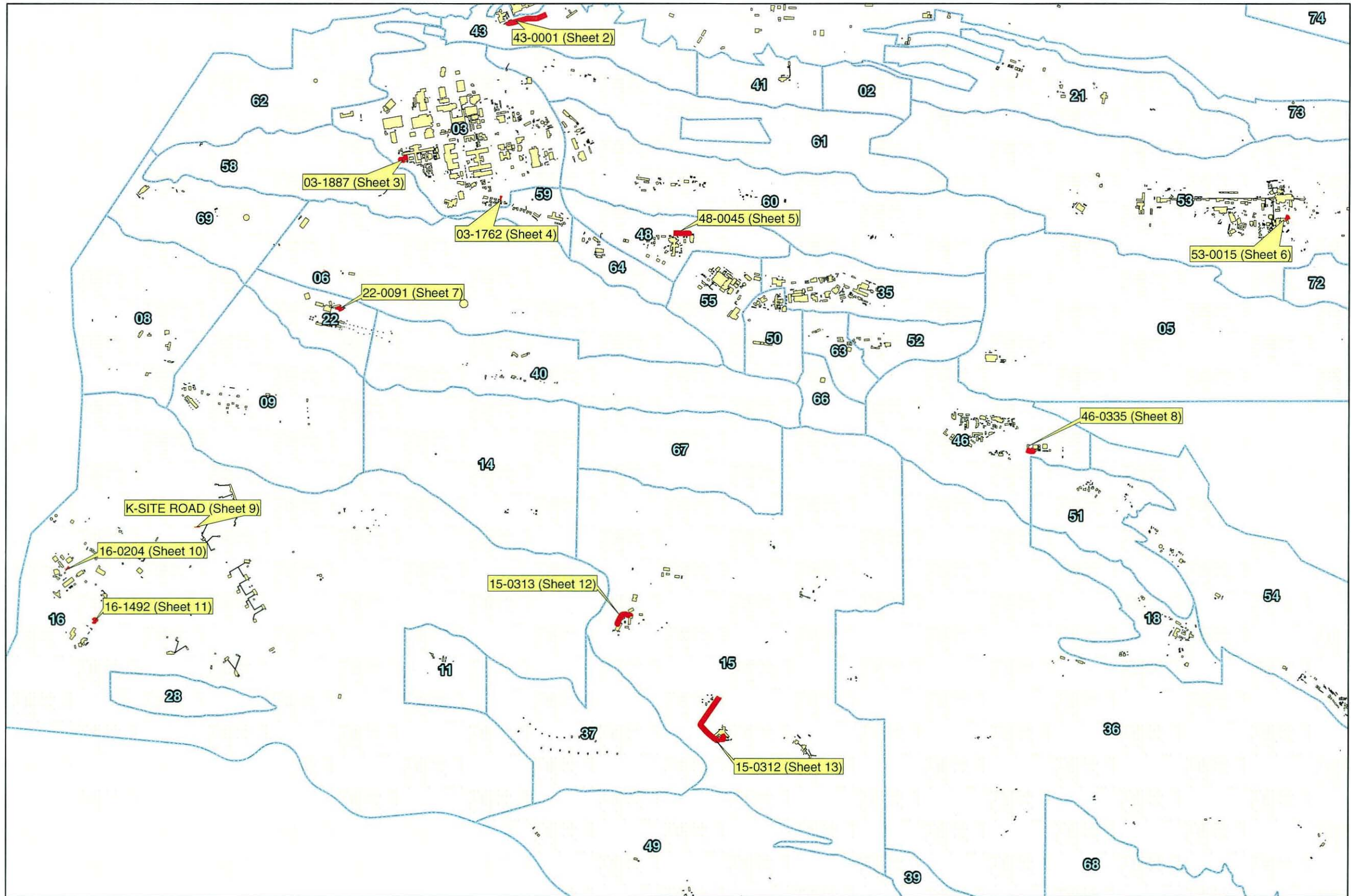
- UN-LOCATABLE GAS LINE

MISCELLANEOUS FEATURES

- DOE PROPERTY
- BUILDINGS
- PAVED ROADS
- INDUSTRIAL FENCE
- SECURITY FENCE
- LANDSCAPE

1,100 550 0 1,100 2,200 3,300
Feet

February 10, 2011



Key Map
SHEET 1 of 13



UN-LOCATABLE GAS LINES
LOS ALAMOS NATIONAL LABORATORY



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DATE: 12/16/2010

**UN-LOCATABLE
GAS LINES
(43-0001)**

MAP LOCATION



LEGEND

- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - ✕ SECURITY FENCE
 - LANDSCAPE

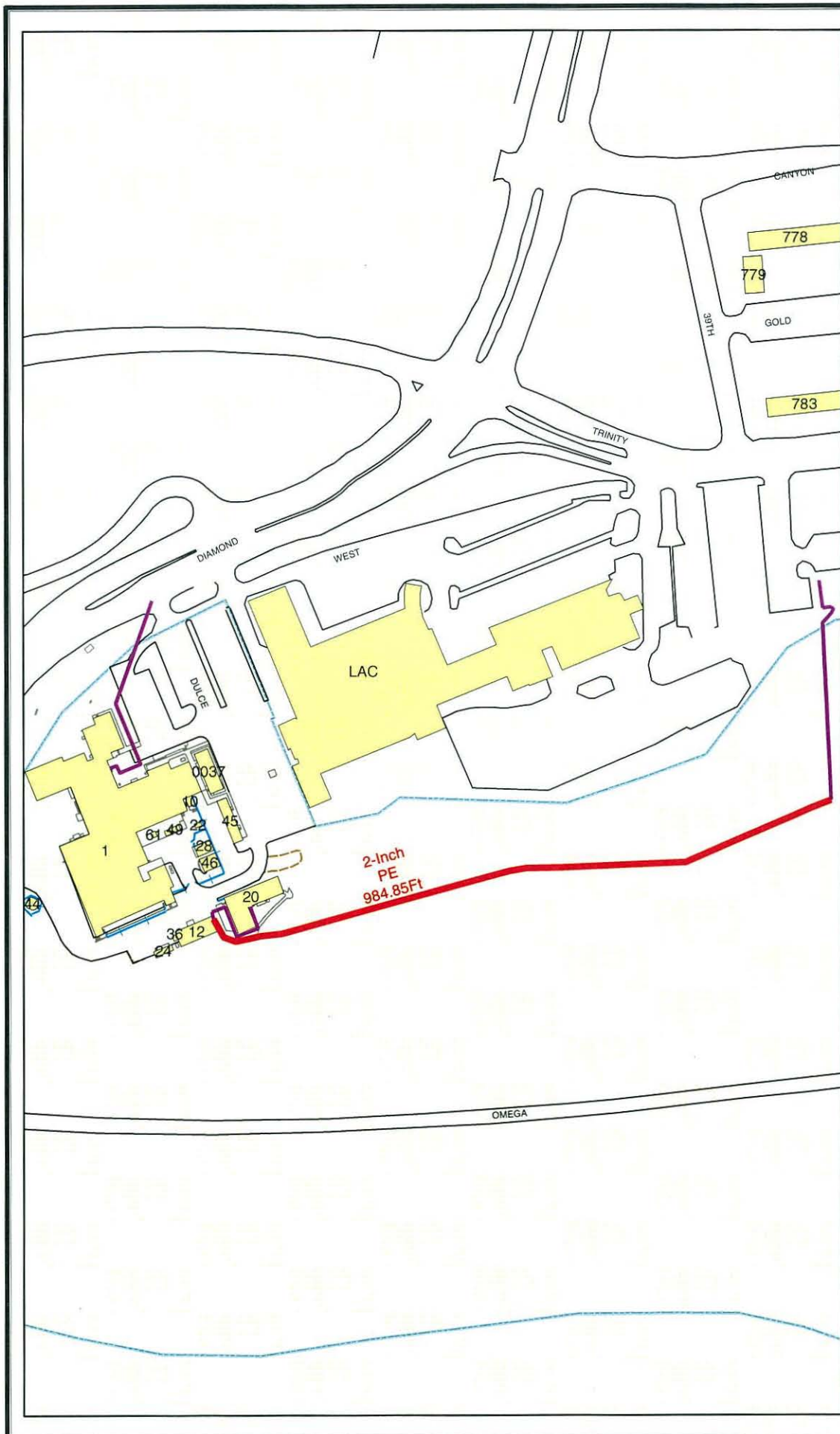


February 10, 2011

SHEET 2 of 13



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REVIEWER: *[Signature]*
DATE: 12/16/2010



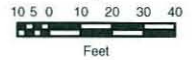
**UN-LOCATABLE
GAS LINES
(03-1887)**

MAP LOCATION

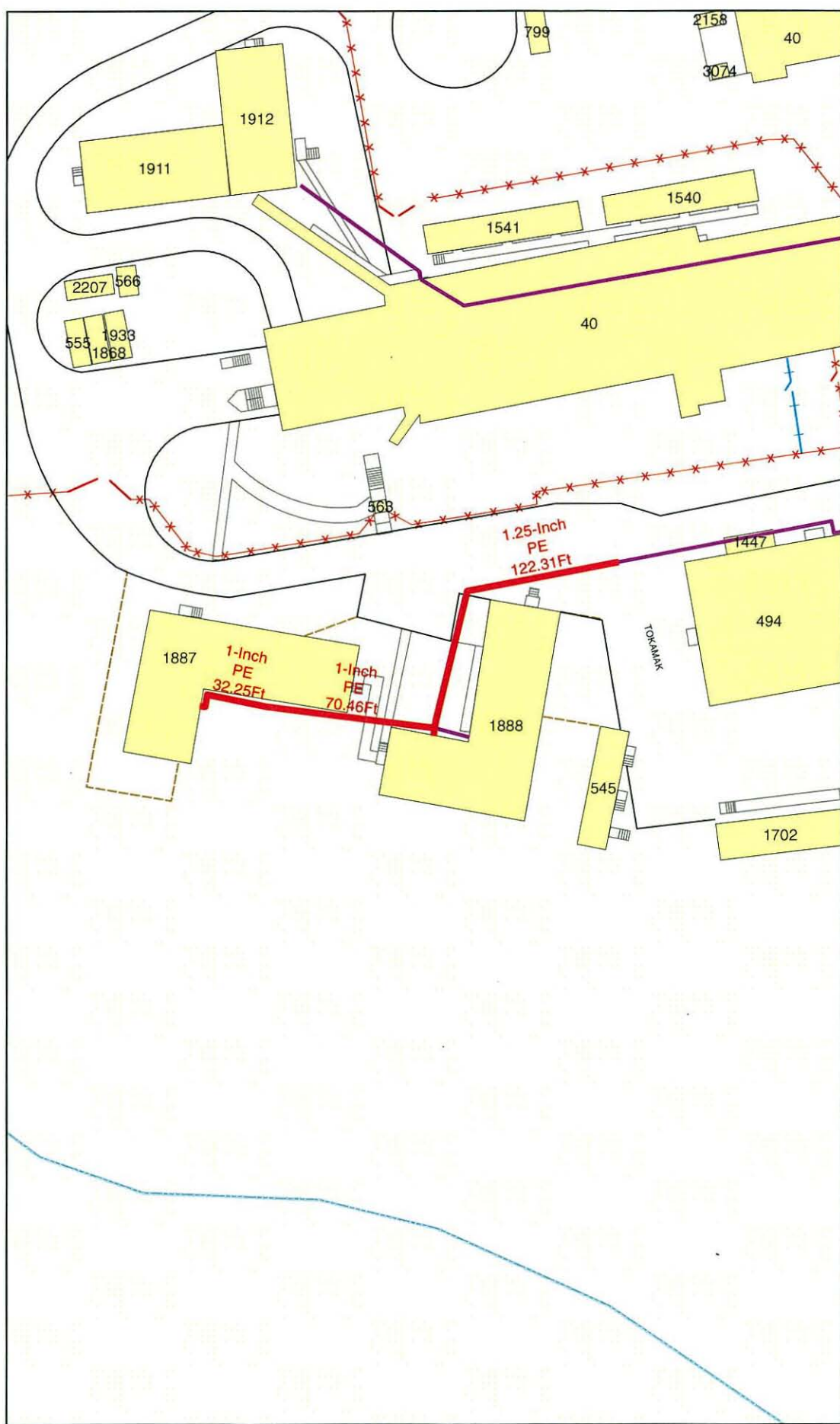


LEGEND

- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - * SECURITY FENCE
 - LANDSCAPE



February 10, 2011



SHEET 3 of 13



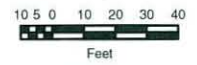
CLASSIFICATION: U
REVIEWER: *[Signature]*
DATE: 12/16/2010

UN-LOCATABLE
GAS LINES
(03-1762)



LEGEND

- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - ✕ SECURITY FENCE
 - LANDSCAPE

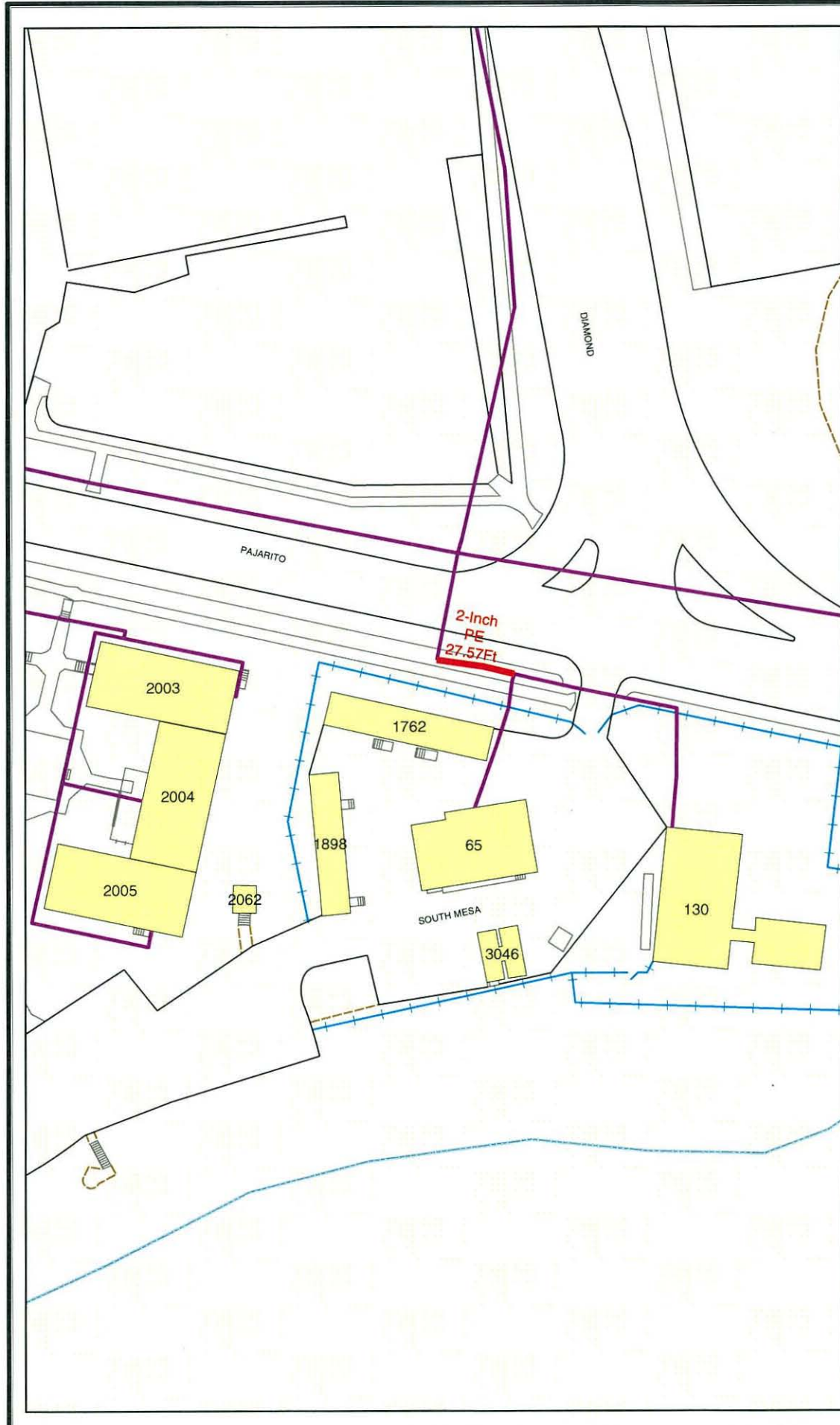


February 10, 2011

SHEET 4 of 13



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REVIEWER: *[Signature]*
DATE: 12/16/2010



UN-LOCATABLE GAS LINES (48-0045)

MAP LOCATION



LEGEND

- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - SECURITY FENCE
 - LANDSCAPE



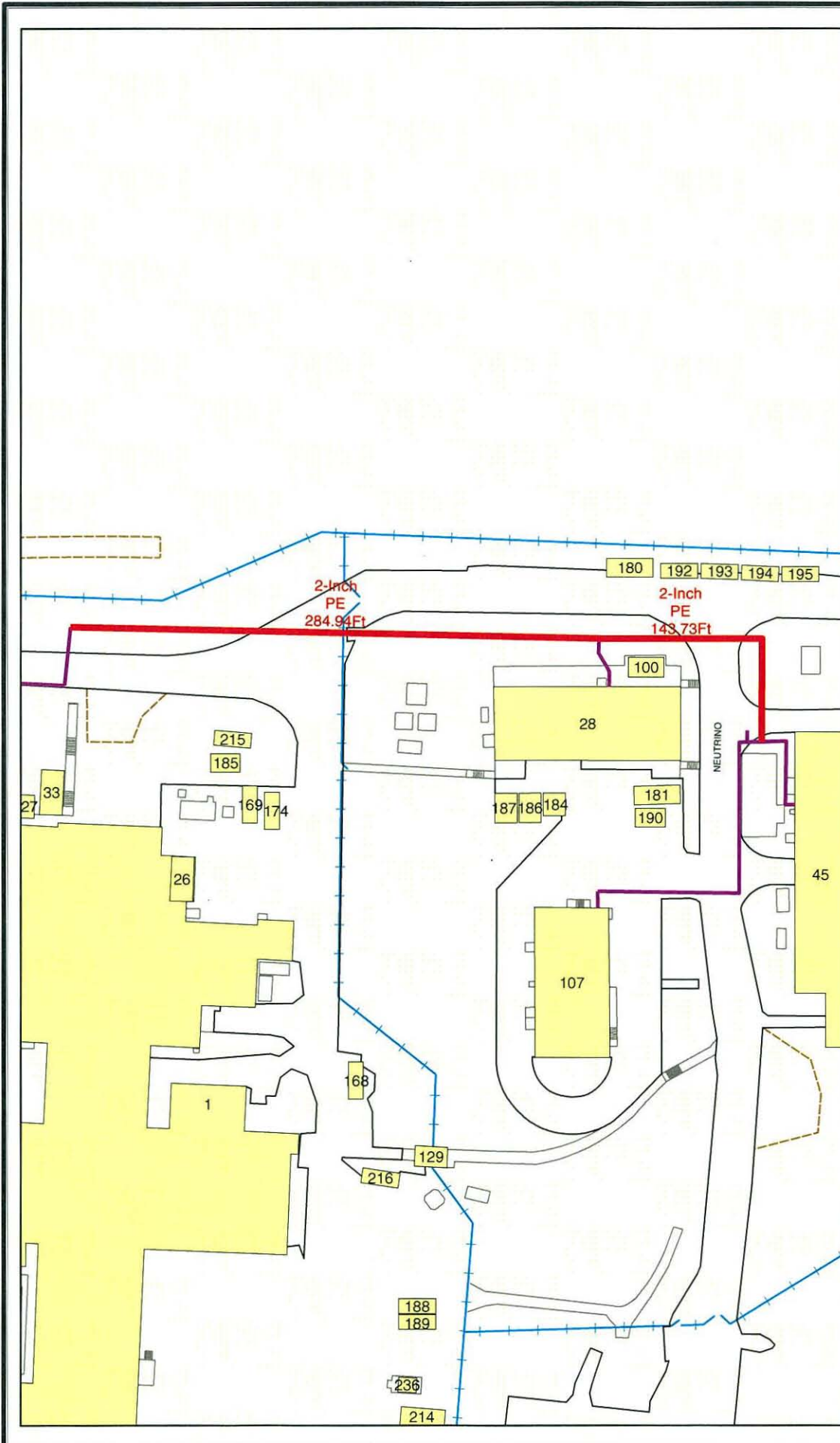
February 10, 2011

SHEET 5 of 13



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REVIEWER: *[Signature]*
DATE: 12/16/2010

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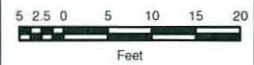


UN-LOCATABLE
GAS LINES
(53-0015)

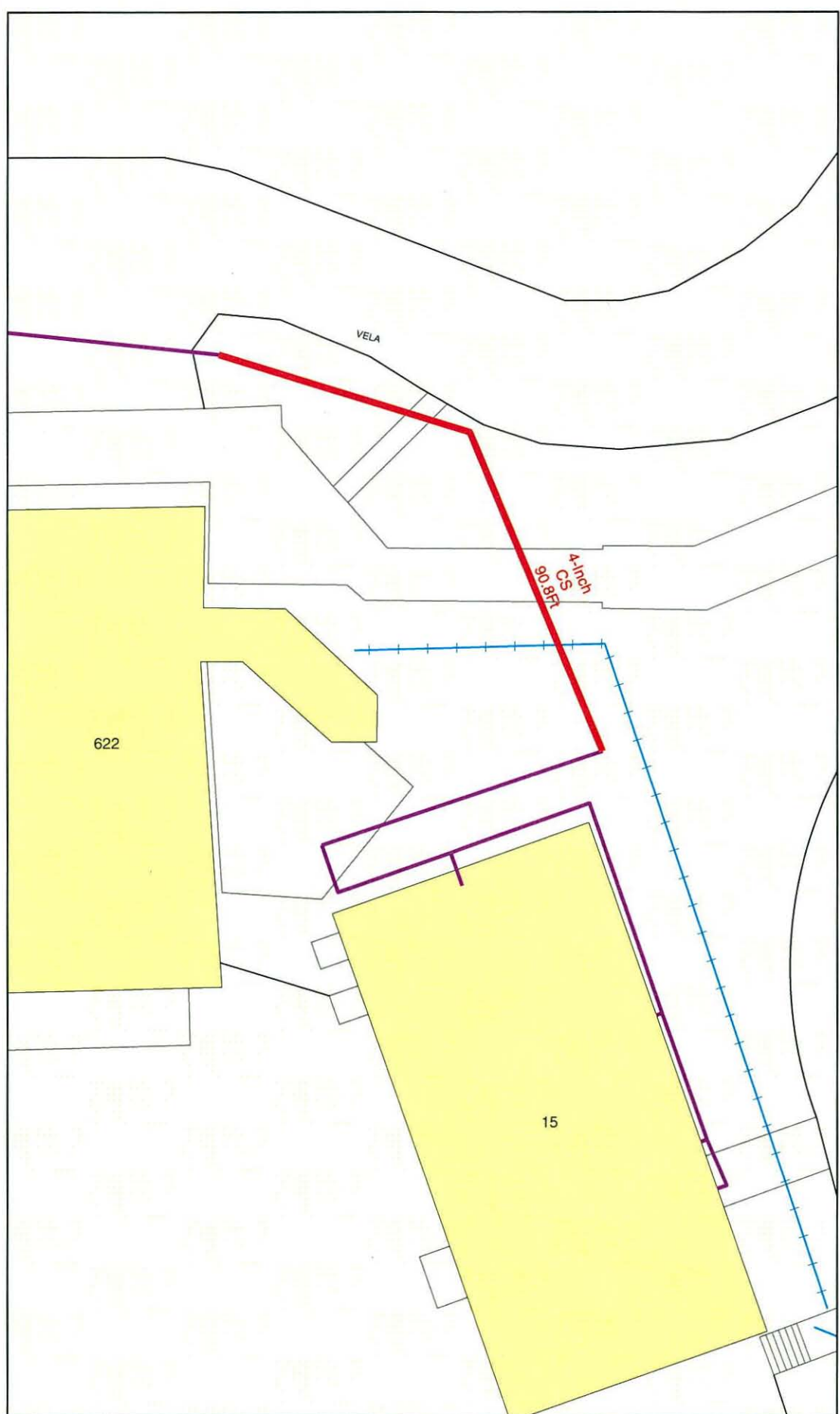


LEGEND

- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - + INDUSTRIAL FENCE
 - x SECURITY FENCE
 - LANDSCAPE



February 10, 2011

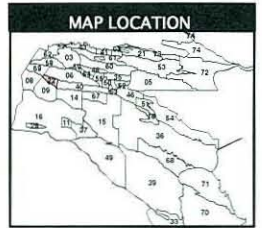


SHEET 6 of 13



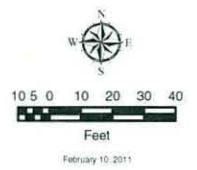
CLASSIFICATION: U
REVIEWER: *[Signature]*
DATE: 12/16/2010

**UN-LOCATABLE
GAS LINES
(22-0091)**



LEGEND

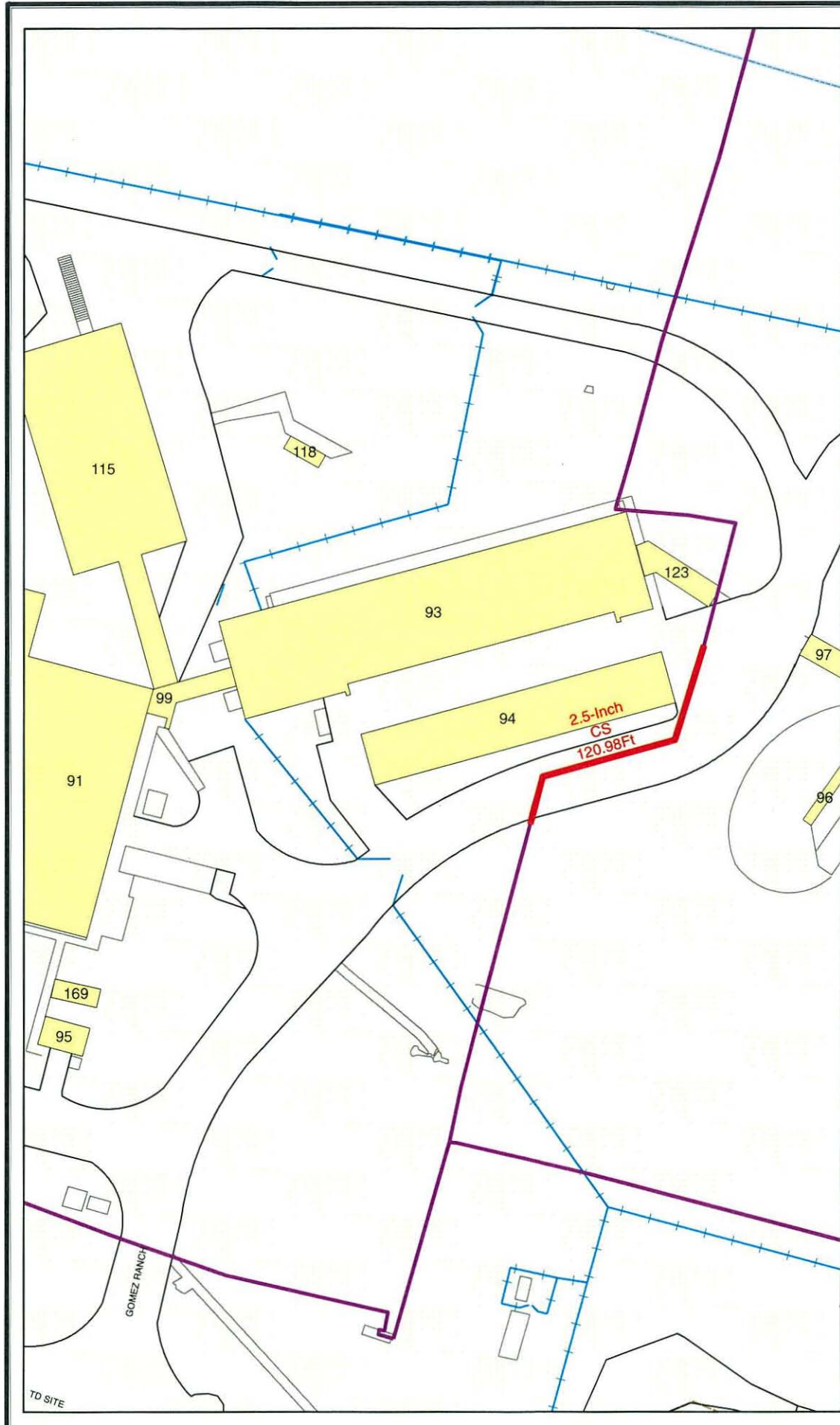
- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - ✕ SECURITY FENCE
 - LANDSCAPE



SHEET 7 of 13



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DATE: 12/16/2010

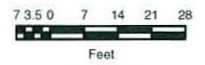


**UN-LOCATABLE
GAS LINES
(46-0335)**



LEGEND

GAS FEATURES	
	GAS LINE
	UN-LOCATABLE GAS LINE
MISCELLANEOUS FEATURES	
	DOE PROPERTY
	BUILDINGS
	PAVED ROADS
	INDUSTRIAL FENCE
	SECURITY FENCE
	LANDSCAPE

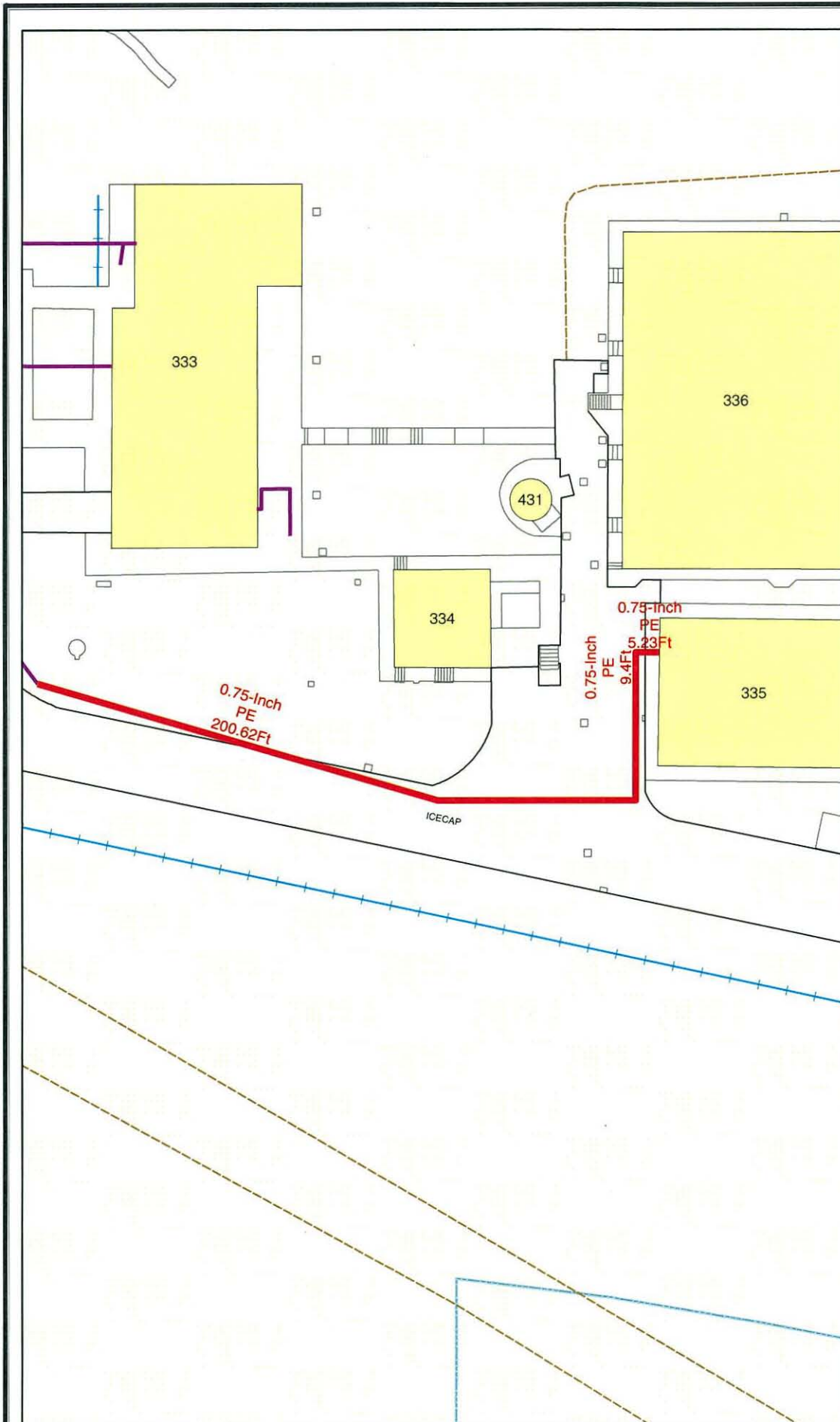


February 10, 2011

SHEET 8 of 13



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REVIEWER: *[Signature]*
DATE: 12/16/2010



UN-LOCATABLE GAS LINES (K-SITE RD)



LEGEND

GAS FEATURES

- GAS LINE (purple line)
- UN-LOCATABLE GAS LINE (red line)

MISCELLANEOUS FEATURES

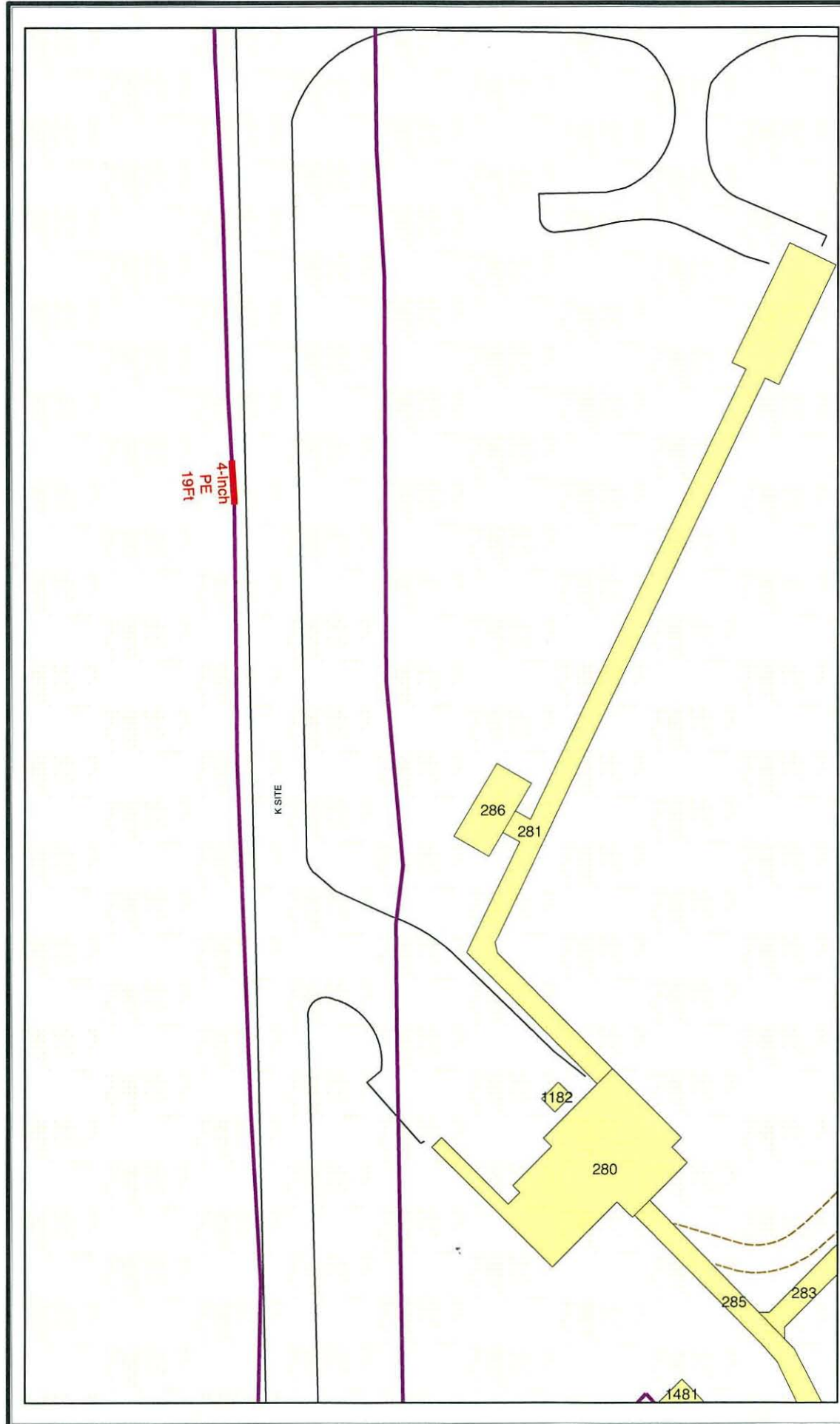
- DOE PROPERTY (blue outline)
- BUILDINGS (yellow fill)
- PAVED ROADS (black line)
- INDUSTRIAL FENCE (blue line with cross-ticks)
- SECURITY FENCE (red line with cross-ticks)
- LANDSCAPE (dashed line)



SHEET 9 of 13

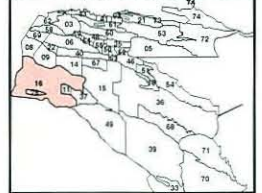


CLASSIFICATION: U
REVIEWER: *[Signature]*
DATE: 12/16/2010



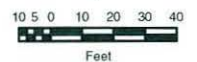
UN-LOCATABLE GAS LINES (16-0204)

MAP LOCATION

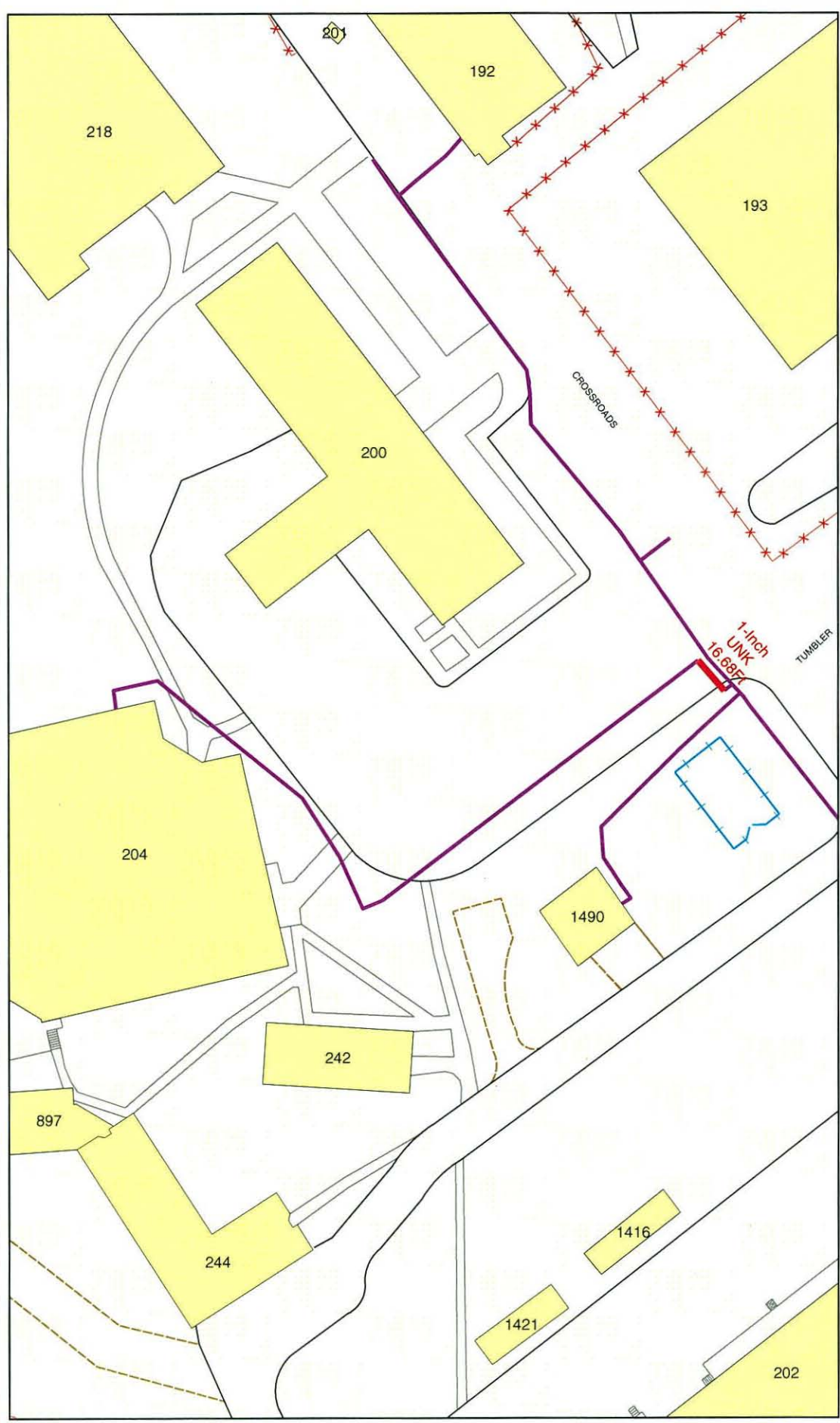


LEGEND

- GAS FEATURES**
- GAS LINE
 - UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
- DOE PROPERTY
 - BUILDINGS
 - PAVED ROADS
 - INDUSTRIAL FENCE
 - SECURITY FENCE
 - LANDSCAPE



February 10, 2011



SHEET 10 of 13



CLASSIFICATION: U
REVIEWER: *[Signature]*
DATE: 12/16/2010

UN-LOCATABLE GAS LINES (16-1492)



LEGEND

- GAS FEATURES**
-  GAS LINE
 -  UN-LOCATABLE GAS LINE
- MISCELLANEOUS FEATURES**
-  DOE PROPERTY
 -  BUILDINGS
 -  PAVED ROADS
 -  INDUSTRIAL FENCE
 -  SECURITY FENCE
 -  LANDSCAPE




February 10, 2011



SHEET 11 of 13



CLASSIFICATION: U
 REVIEWER: 
 DATE: 12/16/2010

UN-LOCATABLE GAS LINES (15-0313)



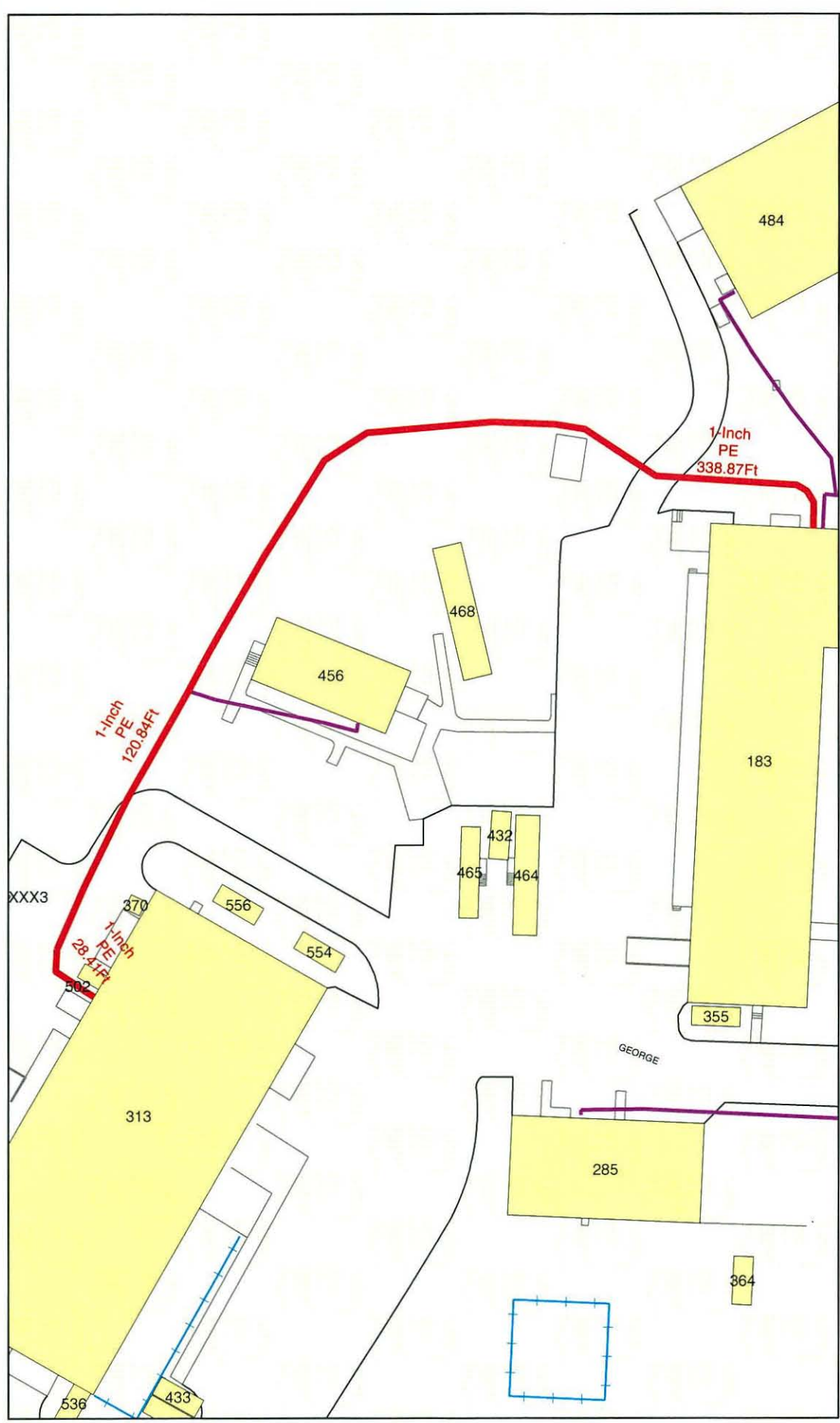
LEGEND

GAS FEATURES

- GAS LINE (purple line)
- UN-LOCATABLE GAS LINE (red line)

MISCELLANEOUS FEATURES

- DOE PROPERTY (blue dashed line)
- BUILDINGS (yellow fill)
- PAVED ROADS (black line)
- INDUSTRIAL FENCE (blue line with cross-ticks)
- SECURITY FENCE (red star symbol)
- LANDSCAPE (grey line)



SHEET 12 of 13



CLASSIFICATION: U
REVIEWER: *[Signature]*
DATE: 12/16/2010

G. Procedure for Ranking Threats

1. Review records and interview LANL employees who operate and maintain the LANL Natural Gas Distribution System on the elements of the Plan. Also, use SHRIMPTM to develop information in the following categories (as stated in 49 CFR Part 192.1007):
 - a. Corrosion
 - b. Incorrect Operations
 - c. Equipment Malfunctions
 - d. Material, Welds, and Joints
 - e. Excavation Damage
 - f. Natural Forces
 - g. Other Outside Forces
 - h. Other Threats
2. Determine the threats to the LANL Natural Gas Distribution System based on the information gained in Step 1.
3. Analyze the threats from Step 2 subjectively and mathematically by developing a risk matrix. The categories used to analyze the LANL Natural Gas Distribution System are as follows:
 - a. Pipeline Damage – potential damage to the pipeline as a direct consequence of the threat
 - b. Maintenance – potential amount of additional maintenance if the threat is ignored
 - c. Safety – potential impact to LANL personnel due to the threat
 - d. Excavation Damage – potential damage to pipeline caused by excavation because of the threat
 - e. Loss of Service - service of customers that may be lost due to the threat
 - f. Economics – potential cost rank if the threat is ignored
 - g. Federal/State Compliance – potential impact on compliance if the threat is not mitigated
 - h. Probability of Event Occurring – probability the threat will occur and affect operations
4. The risk is calculated to be on a scale of 0 to 3:

0 = No Risk
1 = Low Risk
2 = Moderate Risk
3 = High Risk

The risk is determined assuming a 5 year time frame with the same level of funding and operation as the most recent FY. FY 2010 is used for the matrix developed in this Plan.

5. The risk values from categories a-g in Step 3. are added together and multiplied by h (Probability of Event Occurring), also in Step 3., to determine the calculated risk. The threat with the highest calculated risk is assumed to be the biggest threat to the LANL Natural Gas Distribution System and the lowest calculated risk is assumed to be the smallest threat.
6. Evaluation of the risk values was determined by a team consisting of Robert Keown (UI Corrosion Specialist), Adrienne Beckman (UI Civil Engineering Graduate Student), Thomas Hay (UI Engineering Systems Deputy Group Leader), and Jerome Gonzales (UI Civil Engineering Team Leader).

The risk analysis matrix created for this Plan can be found on the following page.

		RISK ANALYSIS*								Calculated Risk
		Pipeline Damage	Maintenance	Safety	Excavation Damage	Loss of Service	Economics	Federal/State Compliance	Probability of Event Occurring	
THREAT	PE Gas Lines within 20 Feet of Steam Lines	3	2	2	0	2	2	3	3	42
	Documentation and Record Maintenance	1	2	2	2	1	2	3	3	39
	Un-locatable Pipe / Unknown Material	2	1	2	2	2	2	3	2	28
	Instrumentation	1	1	3	0	1	2	2	2	20
	Equipment Malfunctions due to Regulators	0	2	2	0	2	2	2	2	20
	Cathodic Protection/ Anode Beds	2	1	1	0	1	2	2	2	18
	Seismic	3	3	3	0	3	3	0	1	15
	Equipment Malfunctions due to Valves	1	1	2	1	1	2	3	1	11
	Equipment Malfunctions due to Meters	0	1	1	0	2	2	2	1	8

0 = no risk

1 = low risk

2 = moderate risk

3 = high risk

Pipeline Damage:

Potential damage to the pipeline as a direct consequence of the threat

Maintenance:

Potential amount of additional maintenance if the threat is ignored

Safety:

Potential impact to LANL personnel due to the threat

Excavation Damage:

Potential damage to pipeline caused by excavation because of the threat

Loss of Service:

Service to customers that may be lost due to the threat

Economics:

Potential cost rank if the threat is ignored

Federal/State Compliance:

Potential impact on compliance if the threat is not mitigated

Probability of Event Occurring:

Probability the threat will occur and affect operations

calculated risk = consequence x probability

*Risk 5 years from now if we continue to fund and operate at the same level as FY 2010

H. Danger of PE Gas Lines too close to Steam Lines

PE lines within a certain distance of steam lines are affected by the heat. When a PE gas line heats up, its pressure rating is decreased. The following table and graph show the correlation between the PE line's pressure rating and the temperature of the pipe.

The equations used to determine the pressure derating are based on the ASTM method for determining design pressure from Hydrostatic Design Basis (HDB) and (Plastic Pipe Institute) PPI TR-3. The values for S_L , S_H , T_L , and T_H are taken from PerformancePipe's DRISCOPIPE® 8100 HDPE Hydrostatic design basis.

$$S_T = S_L - ((S_L - S_H) * (1/T_L - 1/T_T)) / (1/T_L - 1/T_H)$$

S_T = Long-Term Strength (LTHS) at interpolation temperature (psi)

S_L = LTHS at the lower temperature (psi)

S_H = LTHS at the high temperature (psi)

T_T = interpolation temperature (K)

T_L = lower temperature (K)

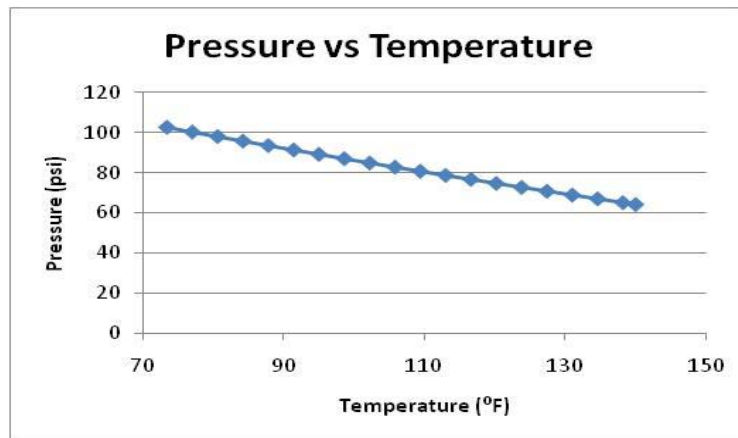
T_H = higher temperature (K)

$$P = (2 * HDB / (SDR - 1)) * DF$$

P = Pressure

SDR = Standard Dimension Ratio (11)

DF = Design Factor (0.32)



The following page contains the table version of the graph.

Temp (°F)	Temp (°C)	Pressure
73.4	23	102.4
77	25	100.032
80.6	27	97.792
84.2	29	95.552
87.8	31	93.312
91.4	33	91.136
95	35	88.96
98.6	37	86.784
102.2	39	84.672
105.8	41	82.56
109.4	43	80.512
113	45	78.464
116.6	47	76.48
120.2	49	74.496
123.8	51	72.512
127.4	53	70.592
131	55	68.672
134.6	57	66.816
138.2	59	64.896
140	60	64

I. Current Records Kept and Procedures Followed

LANL is currently required to keep records on the LANL Natural Gas Distribution System of the following performance measures:

1. The number of hazardous leaks either eliminated or repaired, categorized by cause
2. The number of excavation damages
3. The number of excavation tickets received
4. The number of leaks either eliminated or repaired, categorized by cause
5. The number of hazardous leaks either eliminated or repaired, categorized by material

These performance measures must be tracked for the LANL Natural Gas Distribution System covered in this Plan regardless of the outcome of the threat assessment and risk ranking processes.

LANL currently keeps the following records:

- Anything Generated by UI-PROC-67-00-170-R0
- Copies of Excavation Permits
- Meter Spin Test
- New Construction Records
- Welding Inspections
- DOT Form RSPA 7100.1
- Form 11-02-027.2 (Preliminary Occurrence Report)
- Form 67-00-01 (Gas Leak Response Report)
- Form 67-00-011.1 (Gas Leak and Repair Report)
- Form 67-00-011.1 (Report of Main and Service Line Inspection)
- Form 67-00-011.2 (Gas Leak Repair Report)
- Form 67-00-017.1 (Operator Qualification Record)
- Form 67-00-017.1 (Plastic Welder Qualification)
- Form 67-00-030.1 (Gas Pipeline Pressure Test Report)
- Form 67-00-031.1 (Record of Abandoned Main or Service)
- Form 67-00-034.1 (Monthly Gas Odorization Test Report)
- Form UI-PROC-67-00-035.1 (Anode Installation on Steel Gas Line Construction)
- Form UI-PROC-67-00-035.2 (Metal Potential)
- Form UI-PROC-67-00-035.3 (Corrosion Control Survey Data Sheet)
- Form 67-00-037.1 (Regulating Station Inspection)
- Form 67-00-038.1 (Relief Device Inspection and Testing Record)
- Form 67-00-090.1 (Gas Leak Report Checklist)
- Form 77-00-015.2 (Single and Double Cut Regulator Assembly Equipment Maintenance Checklist)
- Form 77-00-020.1 (Chatterbox Alarm Test Monitor Record Sheet)
- Form 77-00-028.1 (Patrolling of Distribution System)
- 77-00-033 (Key Valve Inspection)
- Form 77-00-035.1 (Regulator Station Inspection Record)

This page contains a list of procedures performed by MSS that are associated with the LANL Natural Gas Distribution System.

Procedure Number	Procedure Name
67-00-007	In-Service Welding
67-00-017	Certification of Welders for Plastic Pipe
67-00-023	Line Purging
67-00-027	Line Markers
67-00-031	Abandonment of Facilities- Gas
67-00-032	Prevention of Accidental Ignition of Natural Gas
67-00-036	Gas Leak Repairs
67-00-038	Testing of Relief Devices
67-00-041	Damage Prevention Program
67-00-042	Class Location
67-00-043	Construction and Installation of Natural Gas System
67-00-050	Tapping Machine Operation- Gas Operation
67-00-060	Drilling Machine Operations- Gas Operations
67-00-070	Stoppel Fitting Tool Operation- Gas Operations
67-00-080	Controlled Fire Operations
67-00-090	Natural Gas System Overpressure Response
67-00-110	Incident Reports- Gas Operations
67-00-120	Reporting Safety Related Conditions- Gas Operations
UI-PROC-67-00-030-R0	Natural Gas Pipeline Pressure Testing
UI-PROC-67-00-034-R0	Odorization of Gas
UI-PROC-67-00-035-R0	Cathodic Protection Design and Installation
UI-PROC-67-00-170-R0	Gas Emergency Curtailment Plan
UI-PROC-77-00-028-R0	Patrolling Aboveground Gas Lines

J. Leak Classification

Actions currently taken to address risks are based on leak classification. The following tables (**Table 8-1 to 8-3**) contain the definition of the class (1, 2, or 3), examples of what qualifies as a class leak, and the actions that should be taken to address the leak.

LEAK CLASSIFICATION AND ACTION CRITERIA

These leak classification and action criteria are taken from the Guide for Gas Transmission and Distribution Piping Systems, 2003 edition. A complete copy of the GPTC Guide can be purchased at www.aga.org.

Table 0-1 *Leak Classification and Action Criteria - Class 1*

LEAK CLASSIFICATION AND ACTION CRITERIA – Class 1		
Class Definition	Examples	Action Criteria
A leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous. See §192.703(c).	<ol style="list-style-type: none"> 1. Any leak which, in the judgment of operating personnel at the scene, is regarded as an immediate hazard. 2. Escaping gas that has ignited. 3. Any indication of gas which has migrated into or under a building, or into a tunnel. 4. Any reading at the outside wall of a building, or where gas would likely migrate to an outside wall of a building. 5. Any reading of 80% LEL, or greater, in a confined space. 6. Any reading of 80% LEL, or greater in small substructures (other than gas associated substructures) from which gas would likely migrate to the outside wall of a building. 7. Any leak that can be seen, heard, or felt, and which is in a location that may endanger the general public or property. 	<p>Requires prompt action* to protect life and property, and continuous action until the conditions are no longer hazardous</p> <p>* The prompt action in some instances may require one or more of the following:</p> <ol style="list-style-type: none"> a. Implementation of emergency plan (§192.615). b. Evacuating premises. c. Blocking off an area. d. Rerouting traffic. e. Eliminating sources of ignition. f. Venting the area by removing manhole covers, barholing, installing vent holes, or other means. g. Stopping the flow of gas by closing valves or other means. h. Notifying police and fire departments.

Table 0-2 Leak Classification and Action Criteria - Class 2

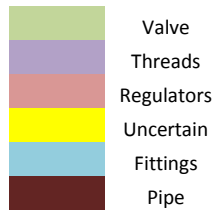
LEAK CLASSIFICATION AND ACTION CRITERIA – Class 2		
Class Definition	Examples	Action Criteria
A leak that is recognized as being non-hazardous at the time of detection, but justifies scheduled repair based on probable future hazard.	<p>A. Leaks Requiring Action Ahead of Ground Freezing or Other Adverse Changes in Venting Conditions.</p> <p>Any leak which, under frozen or other adverse soil conditions, would likely migrate to the outside wall of a building.</p> <p>B. Leaks Requiring Action Within Six Months</p> <ol style="list-style-type: none"> 1. Any reading of 40% LEL, or greater, under a sidewalk in a wall-to-wall paved area that does not qualify as a Grade 1 leak. 2. Any reading of 100% LEL, or greater, under a street in a wall-to-wall paved area that has significant gas migration and does not qualify as a Grade 1 leak. 3. Any reading less than 80% LEL in small substructures (other than gas associated substructures) from which gas would likely migrate creating a probable future hazard. 4. Any reading between 20% LEL and 80% LEL in a confined space. 5. Any reading on a pipeline operating at 30 percent SMYS, or greater, in a class 3 or 4 location, which does not qualify as a Grade 1 leak. 6. Any reading of 80% LEL, or greater, in gas associated substructures. 7. Any leak which, in the judgment of operating personnel at the scene, is of sufficient magnitude to justify scheduled repair. 	<p>Leaks should be repaired or cleared within one calendar year, but no later than 15 months from the date the leak was reported. In determining the repair priority, criteria such as the following should be considered.</p> <ol style="list-style-type: none"> a. Amount and migration of gas. b. Proximity of gas to buildings and subsurface structures. c. Extent of pavement. d. Soil type, and soil conditions, such as frost cap, moisture and natural venting. <p>Grade 2 leaks should be reevaluated at least once every six months until cleared. The frequency of reevaluation should be determined by the location and magnitude of the leakage condition.</p>

Table 0-3 Leak Classification and Action Criteria - Class 3

LEAK CLASSIFICATION AND ACTION CRITERIA – Class 3		
Class Definition	Examples	Action Criteria
A leak that is nonhazardous at the time of detection and can be reasonably expected to remain non-hazardous.	<p>Leaks Requiring Periodic Intervals</p> <ol style="list-style-type: none"> 1. Any reading of less than 80% LEL in small gas associated substructures. 2. Any reading under a street in areas without wall-to-wall paving where it is unlikely the gas could migrate to the outside wall of a building. 3. Any reading of less than 20% LEL in a confined space. 	<p>Reevaluation at</p> <p>These leaks should be reevaluated during the next scheduled survey, or within 15 months of the date reported, whichever occurs first, until the leak is regraded or no longer results in a reading.</p>

K. Gas Leaks 2005 - 2009 Summary

The table contained on the following pages lists the type of gas leak for the years 2005-2009. The line color represents the type of leak. The types of leaks are represented as follows:



The table below is a brief summary of the gas leak results. This table explains why threads, valves, and regulators were addressed in the Equipment Malfunctions section of Threat Assessment. The percentages add up to over 100% because some of the leaks were counted in more than one category to be as conservative as possible.

	Amount	% Total
Total Leaks	147	
Threads	54	37%
Valves	53	36%
Regulators	29	20%
Pipe	10	7%
Miscellaneous	6	4%

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
2005	PHMSA:	OTHER:	14 main	23 service						Total: 14 main, 23 service
1	Leak Survey	TA 3 Diamond Drive	Below	3	KV					
2	Leak Survey	TA 50-184	Below	3	SVC Valve	SV 50005	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
3	Leak Survey	Pajarito and Rex Rd	Below	3	Valve Box-Main	MV 54003				
4	Leak Survey	TA 35 Pecos and Bldg 213	Below	3	MV	MV 35011	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	MV # change from survey to report
5	Leak Survey	TA 46-21	Below	3	SVC Valve	SV 46021	installed long riser/ greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	TA change from survey to report
6	Leak Survey	TA 46-16	Below	3	SVC Valve	SV 46024	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
7	Leak Survey	TA 22, near road	Below	3	Test Box					
8	Leak Survey	TA 15	Below	3	SVC Valve	SV 15009				
9	Leak Survey	TA 8-24	Below	3	SVC Valve	SV 8-0016	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
10	Leak Survey	TA 8-22	Below	3	SVC Valve	SV 8-014	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	not reported by Heath only (Tom Jenkins)
11	Leak Survey	TA 39-89	Below	3	MV	MV 39001A				
1	Leak Survey	TA 61 Royal Crest	Above	3	Meter Index Window					
2	Leak Survey	TA 61 Royal Crest	Above	3	Sensing Line #2 Regulator		tighten fitting	threads	Gas Leak Response Report	not sure this report goes with this leak
3	Leak Survey	TA 53-964	Above	3	Upstream Valve 2"		none		Gas Leak Response Report	
4	Leak Survey	TA 53-964	Above	3	Downstream Valve 2"		greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
5	Leak Survey	TA 3 S-Site Meter	Above	3	Key Valve	KV 00114				
6	Leak	TA 48-45	Above	3	relief valve	2899-H	none	no leak	Gas Leak Response	

Year	Survey Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Report Response Data Source	Comments
7	Leak Survey	TA 35-455	Above	3	Vent	5402	none	no leak found	Gas Leak Response Report	
8	Leak Survey	TA 40-16	Above	3	2" union dist reg		rebuild reg sta, replaced unions	bad reg and union	Gas Leak Repair Report & Gas Leak Response Report	2006 reports
9	Leak Survey	TA 9-282	Above	3	1" union above S-102				Gas Leak Repair Report & Gas Leak Response Report	2006 reports
10	Leak Survey	TA 9-282	Above	3	thermal weld		replaced 1" union above S402 Reg	bad union		
		TA 9-282		2	regulator leaking at diaphragm		replaced regulator	bad gasket	Gas Leak Repair Report & Gas Leak Response Report	
		TA 53-26		2				internal relief vent on 402 reg	Gas Leak Repair Report & Gas Leak Response Report	replaced in 2006
		TA 3-22		3			closed vent valve off	valve was open	Gas Leak Repair Report & Gas Leak Response Report	
		TA 3-514	Above				none	no leak found	Gas Leak Repair Report & Gas Leak Response Report	
		TA 53-30	Above	1	valve not operating		new valve	Corrosion on grease riser	Gas Leak Repair Report & Gas Leak Response Report	
		TA 3-1420	Above	1			new pipe	mueller fitting	Gas Leak Repair Report & Gas Leak Response Report	
		TA 3-1353					replaced 1" black 90	Pm#176422, threads	Gas Leak Repair Report	
		TA 50-069					tighten plug to stop leak	PM #205208, threads	Gas Leak Repair Report	
		TA 48-0008					tighten dielectric union	PM #186328, threads	Gas Leak Repair Report	
		TA 54-1 N					installed 1/4" plug	threads	Gas Leak Repair Report	2004 Leak Summary (#14 AG)
		TA 48-1 SW					none	no leak found	Gas Leak Repair Report	
		TA 55-010					cleaned threads of 90	PM#206983-01, threads	Gas Leak Repair Report	

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
		TA 55-313					repaired 1" union	PM#207136, threads	Gas Leak Repair Report	
		TA 50-37					none	no leak found, PM#177069	Gas Leak Repair Report	
		TA 46-158	Above	1			installed new regulator	mechanical failure	Gas Leak Repair Report & Gas Leak Response Report	
		TA 40-0011				SV 40-009	greased and exercised valve	lack of grease	Gas Leak Repair Report	
		TA 35-87	Above	2			installed new regulator	mechanical failure	Gas Leak Repair Report & Gas Leak Response Report	
		TA 18			Main		replace and reroute pipe	line rupture	Report of Main and Service Line Inspection	
		TA 46-188			Main		replace and reroute pipe	contractor hit pipe	Report of Main and Service Line Inspection	already gonna be rerouted
		TA 61			Main		replace pipe	damaged pipe	Report of Main and Service Line Inspection	
2006	PHMSA:	OTHER OUTSIDE:	1 main	MATERIAL OR WELDS: 1 main		OTHER:	12 main	26 service		Total: 14 main, 26 service
1	Leak Survey	TA 3-253	Below	3	SVC Valve	SV 03041	repair riser on grease zerk	bad grease riser	Gas Leak Repair Report & Gas Leak Response Report	
2	Leak Survey	TA 3-1559	Below	3	Main Valve	MV 03006	none	no leak found	Gas Leak Repair Report & Gas Leak Response Report	
3	Leak Survey	TA 3-410	Below	3	Key Valve-main	KV 03061	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
4	Leak Survey	TA 3-2240 S	Below	3	Key Valve-main	KV 030009	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	valve should be above ground
5	Leak Survey	TA 3-2240 S	Below	3	Key Valve-main	KV 030009A	taped, doped 1 1/2" vent cap, greased	cap loose, valve leaking by	Gas Leak Repair Report & Gas Leak Response Report	

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
6	Leak Survey	TA 3-Eniwwetok Rd	Below	3	SVC Valve	SV 03063				
7	Leak Survey	TA 16-210	Below	3	SVC Valve	SV 16210				
8	Leak Survey	280' W of KV-11-001	Below	3	Main	-				
9	Leak Survey	30' NW of MH 16-790	Below	3	Main	6"				
10	Leak Survey	TA 50-184	Below	3	SVC Valve	SV 50005				carry over
11	Leak Survey	TA 35-85	Below	3	SVC Valve	W of SV 35010				Old tap valve replaced (Report of Main and Service Line Inspection)
12	Leak Survey	TA 35-68	Below	3	SVC Valve	SV 35005	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
13	Leak Survey	TA 35-68	Below	3	Main Valve	MV 35003	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
14	Leak Survey	TA 52 10' W Ag Valve Sta	Below	3	Main	-				
15	Leak Survey	TA 46-16	Below	3	SVC Valve	SV 46024				
16	Leak Survey	TA 39-89	Below	3	Main Valve	MV 39001-A	replaced valve and installed new bailon	plug valve not operating properly	Gas Leak Repair Report & Gas Leak Response Report	cut & cap (Report of Main and Service Line Inspection) (carry over)
17	Leak Survey	TA 22- S of by-pass rd	Below	3	Valve Box-SVC	Test Lead Box	re-taped and doped 3/4" plug on top of mueller fitting	3/4" plug loose, not enough dope & tape	Gas Leak Repair Report & Gas Leak Response Report	carry over
1	Leak Survey	TA 3-462	Above	3	Regulator Vent	S402	replaced reg with new HSR	bad regulator	Gas Leak Repair Report & Gas Leak Response Report	
2	Leak Survey	TA 3-472	Above	3	Regulator Vent	S402	replaced 2 1" unions	unions not tight and old	Gas Leak Repair Report & Gas Leak Response Report	
3	Leak Survey	TA 61 Royal Crest	Above	3	Meter Index		tighten index window on meter	loose meter index window	Gas Leak Repair Report & Gas Leak Response Report	carry over

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
4	Leak Survey	TA 61	Above	3	3" Blow down, valve sta E. Tech Meter 4					
5	Leak Survey	TA 53-10	Above	3	Gas cock downstream 289-2		2ndary reg, maintained by facility	bad valve & leak from relief at reg	Gas Leak Repair Report & Gas Leak Response Report	
6	Leak Survey	TA 16-1490	Above	3	Downstream grease Valve					
7	Leak Survey	289-L 46-1	Above	3	Regulator TA 46-1		replaced relief valve	bad relief	Gas Leak Repair Report & Gas Leak Response Report	reg station needs painting
		TA 35-68	Above	3	grease zert		repaired valve stem (grease zert)	grease zert broken	Gas Leak Repair Report & Gas Leak Response Report	installed CMP instead of valve box to exercise valve
		TA 60-91	Above	3			repaired 1/4" union leaking	no tape and pipe dope	Gas Leak Repair Report & Gas Leak Response Report	
		TA 60-175	Above	3			repaired union and 1" nipple	not enough tape and pipe dope	Gas Leak Repair Report & Gas Leak Response Report	
		TA 61- landfill (271)	Above	1			remove nipple and replace w/ straight pipe	nipple hit by excavator	Gas Leak Repair Report & Gas Leak Response Report	
		TA 3- 473	Above	2			replaced nipple	threads	Gas Leak Repair Report & Gas Leak Response Report	
		TA 55-28		3	reg sta		tightened 1 1/2" outlet @ meter	not tight enough	Gas Leak Repair Report & Gas Leak Response Report	
		TA 55 between 5 & 114		3	reg sta		replaced regulator	bad regulator	Gas Leak Repair Report & Gas Leak Response Report	
		TA 3-1549	Above	3			tephlon tape & pipe dope on threads	nipple leaking	Gas Leak Repair Report & Gas Leak Response Report	
		TA 35-E of 213		3			replace reg	bad regulator	Gas Leak Repair Report & Gas Leak Response Report	
		TA 48-1		3			reset relief valve	bad relief valve	Gas Leak Repair Report & Gas Leak Response Report	

		TA 3 between 1566 & 28		3			adjusted relief to proper pressure	relief valve set too low	Gas Leak Repair Report & Gas Leak Response Report	
Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
		TA 63-52,53,54		3			set relief valve to 11 wc	relief valve set too close to reg pressure	Gas Leak Repair Report & Gas Leak Response Report	
		TA 53-26		2			replaced reg and installed new HSR	internal relief vent on 402 reg	Gas Leak Repair Report & Gas Leak Response Report	carry over
		TA 63					replace 2" valve	valve stuck	Report of Main and Service Line Inspection	no leak
2007	PHMSA:	Operations: 1 main	Other Outside: 1 service		Equipment: 5 service	Other: 45 service				Total: 1 main, 51 service
1	Leak Survey	E Jemez Rd and main Gate	Below	3	Valve Box-Main	MV 61002		lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
2	Leak Survey	Pajarito Rd and Poye Rd TA 63	Below	3	Key Valve	KV 63038	greased and exercised valve	no leak found	Gas Leak Repair Report & Gas Leak Response Report	
3	Leak Survey	TA 3-461	Below	2	Service Tap, Main Valve	MV 03006	greased and exercised	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	carry over, hard to exercise
4	Leak Survey	TA 3-1420	Below	3	Service	SV 03067	none, PE	no leak found	Gas Leak Repair Report & Gas Leak Response Report	
5	Leak Survey	TA 3-514	Below	3	Main Valve	MV 03058	greased and exercised valve	no leak found	Gas Leak Repair Report & Gas Leak Response Report	
6	Leak Survey	TA 8-22	Below	3	SVC Valve	SV 08014	none	no leak found	Gas Leak Repair Report & Gas Leak Response Report	bailon valve/ no grease zert
7	Leak Survey	TA 8-70	Below	3	SVC Valve	SV 08012	replaced grease tube/ greased and exercised	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
8	Leak Survey	TA 15-183	Below	3	SVC Valve	SV 15013	greased and exercised	no leak or odor found	Gas Leak Repair Report & Gas Leak Response Report	grease zert too low
9	Leak Survey	TA 16-210	Below	3	SVC Valve	SV 160041				

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
10	Leak Survey	TA 33	Below	3	Muller Fitting 3'	KV 33025				
11	Leak Survey	TA 46-326	Below	3	Service Tap	SV 46001	greased and exercised valve	no leak or odor found	Gas Leak Repair Report & Gas Leak Response Report	
12	Leak Survey	TA 52, Rd 1	Below	3	Service Tap	SV 52008	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
13	Leak Survey	TA 6- 2 mile mesa road	Below	3	Main Valve	MV 06040	greased and exercised valve	lack of grease	Gas Leak Repair Report & Gas Leak Response Report	
1	Leak Survey	TA 35 N side of Pecos Leak	Above	3	Meter outlet outside 6" flange					
2	Leak Survey	TA 35-213	Above	3	dielectric union					
3	Leak Survey	TA 35-326	Above	3	regulator vent					
4	Leak Survey	TA 45-535	Above	3	inlet on side of union					
5	Leak Survey	TA 46 WA 120	Above	3	Union fitting					
6	Leak Survey	TA 52 rd 45	Above	3	inlet side of union/S side of bldg					
7	Leak Survey	TA 52 rd 35	Above	3	inlet valve and all 3 unions and last elbow					
8	Leak Survey	TA 52 rd 116	Above	3	2nd elbow inlet threads					
9	Leak Survey	TA 52-117	Above	3	SW corner bldg, 2nd elbow inlet threads					
10	Leak Survey	TA 54-1004	Above	3	grease fitting on inlet valve					
11	Leak Survey	TA 59-1	Above	3	outlet threads of inlet valve & outlet threads					
12	Leak Survey	TA 59-96	Above	3	inlet petes plug					
13	Leak Survey	TA 59-3	Above	3	both unions and tee at drop					
14	Leak Survey	TA 64-39	Above	3	union					

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
15	Leak Survey	TA 64-64	Above	3	inlet threads @ 2nd elbow					
16	Leak Survey	TA 3-2006	Above	3	reg vent and petes plug					
17	Leak Survey	TA 3-2004	Above	3	union coupling					
18	Leak Survey	TA 3-SN 1612	Above	3	inlet threads					
19	Leak Survey	TA 3-468	Above	3	outlet threads					
20	Leak Survey	TA 3-SM 473	Above	3	reg body					
21	Leak Survey	TA 3-SM 40	Above	3	reg vent					
22	Leak Survey	TA 8-22 NW corner	Above	3	2" union threads		replaced union and nipple	threads bad	Gas Leak and Repair Report	
23	Leak Survey	TA 15-534	Above	3	1st pete plug					
24	Leak Survey	TA 18-1480	Above	3	90 elbow outlet threads					
25	Leak Survey	TA 16-1484	Above	3	2nd tee on pass		repaired threads @ 90 Elbow (Tape & Pipe Dope)	threads bad	Gas Leak Repair Report & Gas Leak Response Report	
26	Leak Survey	TA 16-360	Above	3	outlet bell reducer		1st repaired threads, then replaced bell reducer	Bell Reducer Leaking	Gas Leak Repair Report & Gas Leak Response Report	
27	Leak Survey	TA 53- 964	Above	3	union fitting		replaced union	bad union	Gas Leak Repair Report & Gas Leak Response Report	
28	Leak Survey	bldg 3-N	Above	3	union fitting & inlet threads					
29	Leak Survey	ta 53-1 (W side)	Above	3	last 2" union		repaired threads and union	bad threads and union	Gas Leak Repair Report & Gas Leak Response Report	
30	Leak Survey	TA 53-398	Above	3	1st 1" union		replaced union	bad union	Gas Leak Repair Report & Gas Leak Response Report	
31	Leak Survey	TA 53-15	Above	3	inlet valve in riser					
32	Leak Survey	TA 3-37	Above	3	1st union		replaced union	bad union	Gas Leak Repair Report & Gas Leak	

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
33	Leak Survey	TA 46-165	Above	3	1" plug valve on riser					
		TA 3-38		1	main line		replace PE w/ 2" steel	too close to steam line	Report of Main and Service Line Inspection	
		TA 55-66			regulator station		replaced regulator 5202	someone damaged regulator	Gas Leak and Repair Report	
		TA 35-87			-	-	none	no leak found	Gas Leak Repair Report & Gas Leak Response Report	smelled boiler
		TA 48-46 & 47			-	-	none	no leak found	Gas Leak Repair Report & Gas Leak Response Report	unit heater not working properly
		TA 55-107	Below		1" steel line broke at coupling		welded 1" x4'=pipe		Gas Leak Repair Report & Gas Leak Response Report	
		TA 53-407			Relief Valve		adjusted relief valve	relief valve set too low	Gas Leak Repair Report & Gas Leak Response Report	
		TA 60-250			meter		replaced meter	hole meter by snow removal	Gas Leak Repair Report & Gas Leak Response Report	
		TA 55-PF-6			-		replaced 3-243 RPC 1-RPC & 2 RPC-B	no leak/ bad reg seat	Gas Leak Repair Report & Gas Leak Response Report	
		TA 9-265 Boiler					none	no leak/ bad adjustment by boiler rep	Gas Leak Repair Report & Gas Leak Response Report	adjusted regulator to proper pressure
		TA 3-2011			-		none	no leak/ bad electrical component	Gas Leak Repair Report & Gas Leak Response Report	uninteraptive power supply went bad
2008	PHMSA:	Material: 1 main	Corrosion: 2 service		Other: 22 service					Total: 1 main, 24 service
	Leak Survey	TA 55	Below	2	Main					
	Leak Survey	TA 3-24	Below	3	service					

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
	Leak Survey	TA 3 Eniwetok & diamond	Below	3	Key Valve	KV 03060				
	Leak Survey	TA 3-32	Below	3	SVC Valve	SV 03084				
	Leak Survey	TA 46-187	Below	2	Service riser					
	Leak Survey	TA 46-535	Below	3	SVC Valve	SV 46003				
	Leak Survey	bldg 514	Below	3	Service Valve	MV 09068				
	Leak Survey	TA 35-254 (pecos drive)	Below	3	Main Valve	MV 35001				
	Leak Survey	TA 22-120	Above	3	inlet side 62712					
	Leak Survey	TA 8-22	Above	3	inlet side 5202					
	Leak Survey	TA 46 NGRS 3 5202	Above	3	Reg Vent 5202					
	Leak Survey	TA 46-45	Above	3	Reg Vent 5202H					
	Leak Survey	TA 46-182	Above	3	Union					
	Leak Survey	TA 3-2006	Above	3	regulators 5402					carry over
	Leak Survey	bldg 128	Above	3	regulator 62712-642					
	Leak Survey	bldg 68	Above	3	1" dialectric union					
Total: 17	Leak Survey	TA 53-24	Above	3	1" plug valve on riser					
		TA 16-210		-	main line		1" valve being capped	leaking	Report of Main and Service Line Inspection	carry over
2009	PHMSA:	Other: 2 main	Corrosion: 1 service		Other: 8 service	Total: 2 main, 9 service				
	Leak Survey	TA 50-1	Above	-	S202					
	Leak Survey	TA 50-15	Above	3	S402					
	Leak Survey	TA 35-128	Above	2	thru 627R vent					

Year	Data Source	Location	Above/Below	Class	Equipment	Valve Number	Response	Reason	Response Data Source	Comments
	Leak Survey	TA 46- SE 31	Above	1	vent of S202 regulator					
	Leak Survey	TA 46- SE 182	Above	3	1st 1" dielectric union					carry over
	Leak Survey	TA 22-120	Above	3	inlet of 627R reg					carry over
	Leak Survey	TA 16-1491	Above	3	S402 Thru vent 5.7% LEL					
	Leak Survey	TA 16-1486	Above	3	1st 2" 90 elbow on bypass					
	Leak Survey	TA 39	Above	3	Valve Box	MV 39001				
Total: 10	Leak Survey	TA 33	Above	3	Valve Box	KV 33025				
		TA 16-204		1	Service Line			3rd party damage with corrosion (counted as corrosion)	Report of Main and Service Line Inspection	