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November 3, 2006

Mr. Alan E. Rathbun
Pipeline Safety Director
Washington Utilities and Transportation Commission
1300 South Evergreen Park Drive SW
P. O. Box 47250
Olympia, Washington 98504-7250

Subject: Natural Gas Pipeline Safety Inspection, Clark County
Ref. No. Docket PG-060208

Dear Mr. Rathbun:

The inspection of NW Natural's facilities in Clark County was conducted from May 1 to August 24, 2006 by Mr. Scott Rukke of the Washington Utilities and Transportation Commission. In response to the findings of the audit, dated September 22, 2006, NW Natural reports the following:

1. **49 CFR §192.739(a) Pressure Limiting and Regulating Stations: Inspection and Testing**
(a) Each pressure limiting station, relief device (except rupture discs), and pressure regulating station and its equipment must be subjected at intervals not exceeding 15 months, but at least once each calendar year, to inspections and tests to determine that it is–
   (1) In good mechanical condition;
   (2) Adequate from the standpoint of capacity and reliability of operation for the service in which it is employed;
   (3) Except as provided in paragraph (b) of this section, set to control or relieve at the correct pressure consistent with the pressure limits of §192.201(a); and
   (4) Properly installed and protected from dirt, liquids, or other conditions that might prevent proper operation.

Finding(s):
NWN did not maintain the following Pressure Regulating Stations (PRS) on a schedule not to exceed 15 months, but at least once each calendar year, as required. NWN defined these PRS's as Primary Service Regulators (NWN definition dated 2/22/2005 and 4/28/2006) that do not require annual maintenance.

(a) ***Regulator 4-014-029-S-01 located at E/S of NW 11th Ave. – 860' S/O NW 297th Circle.*** *Records indicate that this regulator was maintained on 05/07/2003 and again on 03/31/2005. In addition to not performing maintenance within the 2004 calendar year as required, the maximum 15-month timeframe was also exceeded.*

(b) ***Regulator 1-015-032-S-01 located at E. 13th & "V" St. N/S of Property.*** *Records indicate that this regulator was maintained on 09/09/2003 and again on 08/18/2005. In addition to not performing maintenance within the 2004 calendar year as required, the maximum 15-month timeframe was also exceeded.*

(c) ***Regulator 1-016-046-S-01 located at EPL NE 162nd Ave. & 520' N/O NE 1st St.*** *Records indicate that this regulator was maintained on 04/10/2003 and again on 05/23/2005. In addition to not performing maintenance within the 2004 calendar year as required, the maximum 15-month timeframe was also exceeded.*

(d) ***Regulator 1-022-059-S-01 located at N3 "C" St & 792' W of 6th St.*** *Records indicate that this regulator was maintained on 07/07/2003 and again on 06/14/2005. In addition to not performing maintenance within the 2004 calendar year as required, the maximum 15-month timeframe was also exceeded.*

(e) ***Regulator 1-022-059-S-02 located at S2 "C" St & 500W of 6th St.*** *Records indicate that this regulator was maintained on 07/07/2003 and again on 06/14/2005. In addition to not performing maintenance within the 2004 calendar year as required, the maximum 15-month timeframe was also exceeded.*

NW Natural response:

NW Natural is strongly committed to pipeline safety and to the appropriate inspection and testing of pressure limiting stations and pressure regulating stations (PRS) in accordance with 49 CFR 192.739(a). As discussed in NW Natural's September 8, 2006 response to Staff's data requests, NW Natural first learned of Staff's concerns relative to the company's interpretation of district regulators and primary service regulators during the Natural Gas Pipeline Safety Inspection of Clark County that commenced in May 2006.

The provisions of 49 CFR 192.197(c)(1) stipulate that if the maximum operating pressure of a distribution system exceeds 60 psig, natural gas operators may regulate and limit the pressure of gas delivered to the customer by locating a second regulator upstream from the service regulator. The federal pipeline safety code does not specify these upstream regulators as pressure limiting or pressure regulating stations, and NW Natural has historically designated this upstream regulator as a "*primary* service regulator" to distinguish it from the service regulator that controls final delivery pressure to the customer.

Similarly, the federal code does not clearly define the number of services that can be served from the upstream service regulator or the associated inspection requirements. As a result, different states across the country have adopted different interpretations of a PRS and primary service regulator (or "farm tap"). For example, the state of North Carolina allows up to 10 services on a farm tap. NW Natural's policy regarding primary service regulators has been defined in Standard Practice SPW 743, District and Service Regulators, for over

20 years. The company has historically specified that primary service regulators may serve up to 5 services. In addition, these primary service regulators have been maintained effectively at the frequency of once every 2 years not to exceed 27 months.

In early May, NW Natural learned that Staff's interpretation for PRS includes any regulator that serves more than two services. Although NW Natural has historically defined primary service regulators differently from Staff's interpretation, after learning of Staff's concerns, NW Natural reviewed and evaluated the company's primary service regulators in Clark County to determine if there were installations that did not conform to Staff's interpretation. In a small number of instances, the company voluntarily took action on installations that were incongruent with Staff's interpretation. The actions included the following:

Regulator 40-14-029-S-02 – Installation of one new primary service regulator in parallel with the existing primary service regulator, 4-014-029-S-01.

Regulator 1-015-032-S-01 – Removed.

Regulator 1-016-046-S-01 – Removed.

Regulator 1-022-059-S-02 – Removed.

In its September 8 data response, NW Natural provided Staff with a list of all primary service regulators removed in Clark County subsequent to May 1, 2006, including the associated number of services at the time. One of the primary service regulators cited by Staff, 1-022-059-S-01, located at N3 "C" Street and 792' W of 6th Street, Washougal, was removed for other business reasons, and at the time of removal had only two related services. Therefore, NW Natural believes that this regulator was not in conflict with Staff's interpretation of PRS.

All of the primary service regulators cited by Staff were inspected and tested in accordance with NW Natural's SPW 743 in effect at the time. In addition, the company believed that its definition of primary service regulators was compliant with all of the requirements of 49 CFR 192.

In summary, upon learning of Staff's interpretation of PRS (district regulator stations), NW Natural voluntarily reviewed the company's primary service regulators in Clark County to determine if there were installations that were inconsistent with Staff's interpretation. In a small number of instances, NW Natural took immediate and decisive action to make the primary service regulators in Clark County conform with Staff's interpretation.

2. **49 CFR §192.605(a) & (b)(1) Procedural Manual for Operations, Maintenance, and Emergencies**

   (a) *General. Each operator shall prepare and follow for each pipeline, a manual of written procedures for conducting operations and maintenance activities and for emergency response. For transmission lines, the manual must also include procedures for handling abnormal operations. This manual must be reviewed and updated by the operator at intervals not exceeding 15 months, but at least once each calendar year. This manual must be prepared before operations of a pipeline system commence. Appropriate parts of the manual must be kept at locations where operations and maintenance activities are conducted.*

(b) Maintenance and normal operations. The manual required by paragraph (a) of this section must include procedures for the following, if applicable, to provide safety during maintenance and operations.

(1) Operating, maintaining, and repairing the pipeline in accordance with each of the requirements of this subpart and Subpart M of this part.

WAC 480-93-180(1) Plan of Operations and Maintenance Procedures; Emergency Policy; Reporting Requirements

(1) Each operator must have a plan and procedure manual for operation, maintenance, inspection, and emergency response activities. The manual must comply with the provisions of the "Pipeline Safety Improvement Act of 2002." The manual must include plans and procedures for all requirements of 49 CFR §192 and chapter 480-93 WAC, and any plans or procedures used by an operator's associated contractors.

Finding(s):

(a) *NWN procedure titled Definitions, dated 2/22/2005 and 4/28/2006, defines "District Regulator" as a "pressure reducing station on the pipeline that controls gas pressure from an inlet system to an outlet system and serves a district of six or more customers."*

NWN procedure titled Definitions, dated 2/22/2005 and 4/28/2006, defines "Primary Service Regulator" as a "pressure-regulating device that establishes delivery pressure to 5 or fewer customers from a higher-pressured distribution or transmission line."

These NWN definitions are inconsistent with the definition of Main and Service under 49 CFR §192.3.

(b) *NWN procedure SPW 737, dated 1/25/2006, requires "monthly" calibration of gas detection instruments - Sensit Gold and Trak-IT III. Records indicate that the following instruments were not calibrated monthly as required:*

(1) TRAK-IT III no. 2356, *no calibration record for 4/2006*
(2) TRAK-IT III no. 2375, *no calibration record for 1/2006 or 2/2006*
(3) TRAK-IT III no. 2382, *no calibration record for 4/2006*
(4) TRAK-IT III no. 4605, *no calibration record for 2/2006*
(5) TRAK-IT III no. 4607, *no calibration record for 2/2006*
(6) TRAK-IT III no. 2271, *no calibration record for 1/2006*
(7) TRAK-IT III no. 2274, *no calibration record for 1/2006*
(8) TRAK-IT III no. 2277, *no calibration record for 1/2006*
(9) TRAK-IT III no. 2280, *no calibration record for 4/2006*
(10) TRAK-IT III no. 2297, *no calibration record for 1/2006 or 2/2006*
(11) TRAK-IT III no. 2299, *no calibration record for 1/2006 or 2/2006 or 4/2006*
(12) TRAK-IT III no. 2307, *no calibration record for 4/2006*
(13) TRAK-IT III no. 4613, *no calibration record for 1/2006*
(14) TRAK-IT III no. 4619, *no calibration record for 2/2006*
(15) TRAK-IT III no. 4623, *no calibration record for 2/2006 or 3/2006*
(16) TRAK-IT III no. 4631, *no calibration record for 4/2006*
(17) TRAK-IT III no. 4650, *no calibration record for 4/2006*
(18) TRAK-IT III no. 5946, *no calibration record for 2/2006, 3/2006 or 4/2006*
(19) TRAK-IT III no. 5947, *no calibration record for 1/2006, 2/2006 or 4/2006*

NW Natural response:

(a) As previously discussed in the company's response to Probable Violation 1 above, NW Natural first became aware of Staff's concern with respect to the company's interpretation and definitions of district regulators (PRSs) and primary service regulators (upstream regulators) during the Natural Gas Pipeline Safety Inspection of Clark County beginning in May 2006. The company's definitions of district regulators and primary service regulators have been defined in the Standard Practices for over 20 years and updates have been provided annually to Staff. Prior to May 2006, NW Natural had no reason to believe that Staff disagreed with the company's interpretation and definitions of district regulators and primary service regulators.

As a result of Staff's concerns expressed in May 2006, NW Natural has revised the company's Standard Practices SPW 001, Definitions (Enclosure 1) and SPW 743 (Enclosure 2) relative to district regulators and primary service regulators to conform with Staff's interpretation of 49 CFR 192.3 and 49 CFR 192.739(a), effective November 2, 2006. District regulators are now defined as:

> A regulator station that reduces the pressure from a high-pressure pipeline to a lower pressure pipeline. District regulators may serve one or more services.

Primary service regulators are now defined as:

> A pressure-regulating device that reduces the delivery pressure from a high-pressure pipeline to a lower pressure pipeline. Primary service regulators serve a maximum of two services.

District regulator stations will continue to be inspected and maintained once each calendar year not to exceed 15 months, in accordance with 49 CFR 192.739(a). Primary service regulators will continue to be inspected and maintained once every 2 years not to exceed 27 months.

(b) In response to the findings of the Natural Gas Pipeline Safety Inspection of Clark County, NW Natural has reviewed its calibration records and located additional documentation regarding calibration for the majority of the Trak-It III and Sensit Gold gas detection (combustible gas indicator or CGI) instruments used in Clark County. Enclosed are additional calibration records associated with instruments referenced in Staff's report (Enclosure 3). Please note that instruments with serial numbers 4605, 4607, 4613, 4619, 4623, 4631, 4650, 5946, and 5947 are Sensit Gold CGIs and not Trak-It IIIs as noted in Staff's September 22, 2006 report.

NW Natural has previously calibrated the referenced gas detection instruments significantly more frequently than required by the manufacturer. WAC 480-93-188(2) requires "Gas detection instruments must be maintained, tested for accuracy, calibrated, and operated in accordance with the manufacturer's recommendations." In 2005, NW Natural requested that J And N Enterprises, Inc. provide the company with a letter clarifying the calibration requirements for the Trak-It III and Sensit Gold gas detection instruments used by the company.

On June 10, 2005, Mr. J. Scott Kleppe, President of J And N Enterprises, Inc., provided NW Natural with a letter confirming that "Your calibration on a 90 day basis is adequate for the products we are supplying to you (namely the Trak-It III and Sensit Gold instruments)" (Enclosure 4). Based on the expertise of the company president, the 90-day calibration schedule was deemed to be appropriate for NW Natural based on the company's use of the instruments.

During July 2006, NW Natural's Chief Engineer contacted Mr. Kleppe to confirm the company's understanding of the 90-day calibration requirement. Mr. Kleppe confirmed the appropriateness of the 90-day calibration schedule due to NW Natural's use of the instruments and disciplined calibration protocols. Mr. Kleppe also indicated that the 90-day calibration requirement would be confirmed with other natural gas operators if they were to request clarification.

NW Natural's monthly calibration requirement contained in SPW 737, Leak Detectors and Gas Analyzers, Revision 05, dated January 25, 2006, exceeded the manufacturer's requirements and, therefore, the requirements of WAC 480-93-188. Based on discussions with Staff in May 2006, NW Natural has revised SPW 737 (Revision 6, dated June 12, 2006) (Enclosure 5) to reflect a 90-day calibration schedule in accordance with the manufacturer's recommendations.

In summary, NW Natural believes the company exceeded the manufacturer's instrument calibration requirements for all gas detection instruments cited by Staff. Therefore, the referenced Trak-It III and Sensit Gold leakage detection instruments could be expected to provide accurate, reliable, and repeatable gas indications during the timeframes in question. In accordance with WAC 480-93-180(1), NW Natural has subsequently revised SPW 737 to reflect the manufacturer's 90-day recommendations.

3. 49 CFR §192.225 Welding Procedures

(a) Welding must be performed by a qualified welder in accordance with welding procedures qualified under section 5 of API 1104 (ibr, see §192.7) or section IX of the ASME Boiler and Pressure Vessel Code " Welding and Brazing Qualifications" (ibr, see §192.7) to produce welds meeting the requirements of this subpart. The quality of the test welds used to qualify welding procedures shall be determined by destructive testing in accordance with the applicable welding standard(s).

(b) Each welding procedure must be recorded in detail, including the results of the qualifying tests. This record must be retained and followed whenever the procedure is used.

WAC 480-93-080 Welder and Plastic Joiner Identification and Qualification

(1) All welding procedures and welders, except welders listed in (a) of this subsection, must be qualified to API Standard 1104 or section IX of the ASME Boiler and Pressure Vessel Code.

Finding(s):

NWN weld procedure No. WP-012, dated 11/23/1983 and adopted 5/30/1986, does not have speed of travel incorporated into the procedure. NWN staff originally stated that the procedure was qualified per API 1104 standards and subsequently stated that the procedure was qualified to 49 CFR Appendix C criteria. API 1104 lists speed of travel as an essential variable when qualifying procedures. The procedure does not meet API 1104 criteria and

Appendix C criteria is a welder qualification standard not a procedure qualification standard. When qualifying welders to Appendix C criteria, a welding procedure qualified to API or ASME standards must be used during testing.

NW Natural response:

Following discussions with Staff during the May 2006 inspection of Clark County, NW Natural proactively reviewed all of its welding procedures, including Weld Procedure Specification No. WP-012 and the associated Coupon Test Report, and made appropriate revisions. Weld Procedure Specification No. WP-012 is now Weld Procedure Specification No. WPO-310 (Enclosure 6). The revised procedure includes the required speed of travel as an essential variable. As noted on WPO-310, the procedure was developed in accordance with API 1104 standards. The revised welding procedures were effective June 19, 2006, and copies of all of NW Natural's revised welding procedures were provided to Staff in the company's June 19, 2006 response to data requests. NW Natural qualifies oxyacetylene welders in accordance with 49 CFR 192, Appendix C criteria.

4. **WAC 480-93-185 Gas Leak Investigation**

   1) *Operators must promptly investigate any notification of a leak, explosion, or fire, which may involve gas pipelines or other gas facilities, received from any outside source such as a police or fire department, other utility, contractor, customer, or the general public. Where the investigation reveals a leak, the operator must grade the leak in accordance with WAC 480-93-186, and take appropriate action. The operator must retain the leak investigation record for the life of the pipeline.*

Finding(s):

The following leaks, caused by third party damage, were not graded as required.

(a) W.O. Sub #03106770, located at 5302 NE 22nd Ave, Vancouver.

(b) W.O. Sub #03106932, located at 3204 NE 36th Ave, Vancouver

NW Natural response:

NW Natural respectfully disagrees with Staff's interpretation that third-party excavation damages should be treated as leaks and graded in accordance with WAC 480-93-186. Company policy requires an immediate response to every known excavation damage as if it were a hazardous situation and provides for continuous actions until the site is safe. The company repairs all excavation damages immediately, even though an excavation damage could potentially be classified as a Grade B (Class 2) or Grade C (Class 3) leak. The company's response places an emphasis on the side of safety.

NW Natural believes that hazardous leak (Class A leak) statistics are a valid indicator of gas system integrity, and expects to use hazardous leaks as a performance metric in the upcoming Distribution Integrity Management Program (DIMP). NW Natural is very concerned that incorporating releases due to excavation damages into the company's leakage statistics will mask or contaminate the data, leading to potentially faulty conclusions related to the integrity of a given pipeline. As an example, if damages to new, medium

density polyethylene (PE) pipe are treated as leaks, an operator could inappropriately question the integrity of the pipe, when the more appropriate response would be to review the effectiveness of the damage prevention program.

However, in response to Staff's interpretation of the requirements of WAC 480-93-185, NW Natural has chartered a multi-departmental task group to revise business processes and procedures to incorporate releases caused by third-party excavation damage into the company's leak management program. NW Natural intends to implement the revised program on December 4, 2006.

5. **49 CFR §192.355(b)(1) Customer Meters and Regulators: Protection From Damage**

(b) Service regulator vents and relief vents. Service regulator vents and relief vents must terminate outdoors, and the outdoor terminal must-

(1) Be rain and insect resistant;

Finding(s):

At the time of this inspection, the following service regulators had relief vents which were installed in a manner that could have potentially allowed rain and moisture accumulation inside the regulator which may affect the proper operation of the device.

(a) Meter Number 743434, located at 1900 NE 162nd Avenue, Vancouver, WA 98643-3013.

(b) Meter Number 316080, located at 11500 NE 76th Street, Vancouver, WA.

NW Natural response:

NW Natural has corrected the service regulator relief vents on Meter Number 743434 (Figures 1, 2, and 3) and Meter Number 316080 (Figures 4 and 5).

6. **WAC 480-93-110(8) Corrosion Control**

(8) On all cathodically protected pipelines, the operator must take a cathodic protection test reading each time an employee or representative of the operator exposes the facility and the protective coating is removed.

Finding(s):

At the time of this inspection, NWN was unable to provide documentation indicating that a cathodic protection test reading was taken at 1201 NE 117 Ave in Vancouver. The facility was exposed and the protective coating removed under work order # 03109286, dated 11/07/2005.

NWN procedure No. SPW 459-2, dated 6/9/2005, also requires that a CP test read be taken on steel when exposed and the protective coating is removed.

NW Natural response:

NW Natural has been unable to retrieve documentation confirming the performance of a cathodic protection (CP) test reading at 1201 NE 117th Avenue in Vancouver. As noted by Staff and in accordance with WAC 480-93-110(8), the company Standard Practice SPW 459, Inspection of Exposed Pipe, requires company field personnel to perform a CP

test reading anytime a cathodically protected facility is exposed and the protective coating is removed. Following Staff's findings, NW Natural proactively performed an audit and confirmed that all subsequent instances of exposed steel pipe with protective coating removed included a documented CP test reading as required by WAC 480-93-110(8) and SPW 459.

In order to facilitate documentation of the CP tests required by WAC 480-93-110(8), NW Natural has revised the company's Work Order form to allow field personnel to efficiently document completion of the CP test (Enclosure 7).

In summary, NW Natural believes the missing CP test documentation for 1201 NE 117th Avenue in Vancouver was an isolated incident, and the company has confirmed subsequent instances included appropriate CP test documentation. In addition, NW Natural has implemented additional training and revised forms to facilitate the documentation of key CP test information as required by WAC 480-93-110(8).

7. **WAC 480-93-187 Gas Leak Records**

Each operator must prepare and maintain permanent gas leak records. The leak records must contain sufficient data and information to permit the commission to assess the adequacy of the operator's leakage program. Gas leak records must contain, at a minimum, the following information:

(1) Date and time the leak was detected, investigated, reported, and repaired, and the name of the employee(s) conducting the investigation;
(2) Location of the leak (sufficiently described to allow ready location by other qualified personnel);
(3) Leak grade;
(4) Pipeline classification (e.g., distribution, transmission, service);
(5) If reported by an outside party, the name and address of the reporting party;
(6) Component that leaked (e.g., pipe, tee, flange, valve);
(7) Size and material that leaked (e.g., steel, plastic, cast iron);
(8) Pipe condition;
(9) Type of repair;
(10) Leak cause;
(11) Date pipe installed (if known);
(12) Magnitude and location of CGI readings left; and
(13) Unique identification numbers (such as serial numbers) of leak detection equipment.

Finding(s):

NWN has 4 grade B leaks that were reviewed by commission staff. The documents provided to staff for the 4 leaks did not contain all of the information required by WAC 480-93-187.

(a) Leak ID number 00-0254 located at NW Elm St, and 10th Ave, Camas WA. *Missing data includes the location and magnitude of individual CGI reads left and instrument serial number.*

(b) Leak ID number 05-0425 located at 210 E 13 St, Vancouver WA. *Missing data includes the location and magnitude of individual CGI reads left and instrument serial number.*

(c) ***Leak ID number 98-0120 located at Front and 17th St, Washougal WA.*** *Missing data includes the location and magnitude of individual CGI reads left and instrument serial number.*

(d) ***Leak ID number 06-0021 located at NW 289 St and 34th WA.*** *Missing data includes the location and magnitude of individual CGI reads left and instrument serial number.*

We would also like to note that it is not acceptable to record gas in air magnitude ranges such as NWN does on their Individual Leak Inspection Report. WAC 480-93-187(12) requires that individual readings be recorded along with the location of each reading.

NW Natural response:

NW Natural believes that the company has an effective leakage management program to maintain the safety and integrity of the transmission and distributions systems in accordance with 49 CFR 192.706, 192.723, and WAC 480-93-188. The company's leakage program includes provisions to locate leaks, evaluate or classify leaks, mitigate hazards caused by leaks, reevaluate known leaks on a periodic basis, and keep appropriate records.

NW Natural's SPW 709, Leak Classification and Repair (Enclosure 8), requires company personnel to document the leak information required in WAC 480-93-187, including the magnitude and location of CGI readings left and the unique identification number of leak detection equipment. NW Natural personnel document the serial numbers of CGI instruments used each day in a separate data base (Daily Log for Leakage Detection Equipment). Sample documentation confirming the serial numbers of leakage detection instruments used are enclosed as follows:

Leak ID 00-0254 and 98-0120, 4/6/06, GMI, Serial Number 4442 (Enclosure 9); and
Leak ID 05-0425, 11/21/05, GMI, Serial Number 4442 (Enclosure 10).

In response to Staff's findings, NW Natural has implemented an enhanced process to map and record the magnitude and location of CGI readings as left on the Individual Leak Inspection Report form, effective October 16, 2006. NW Natural believes this action will satisfy Staff's concerns relative to the requirements of WAC 480-93-187(12).

In summary, NW Natural believes the information contained on the company's Daily Log for Leakage Detection Equipment complies with the requirements of WAC 480-93-187(12). However, in response to Staff concerns, NW Natural has implemented an enhanced process to record the exact CGI readings and their respective locations on the company's Individual Leak Inspection Report form. This information will supplement the company's current practice of recording the highest CGI reading expressed by range.

8. WAC 480-93-124(2)(b) (iv), Pipeline Markers

(2)(b) The following pipelines must have pipeline markers installed, not withstanding any exceptions in 49 CFR § 192.707(b):
(iv) On both sides of railroad crossings.

Finding(s):

At the time of this inspection pipeline markers were not installed on both sides of railroad crossings at the following locations as required:

(a) *32nd and approximately D St in Washougal, Washington.*

(b) *24th and approximately D St in Washougal, Washington.*

(c) *20th and approximately D St in Washougal, Washington.*

(d) *6th and approximately B St in Washougal, Washington.*

(e) *3rd (Whitney) and approximately James St in Washougal, Washington.*

NWN procedure No. SPW 705.3.1, dated 12/06/2005, also requires that pipeline markers be installed on both sides of railroad crossings.

NW Natural response:

As Staff noted, NW Natural's SPW 705, Pipeline Markers (Enclosure 11), requires pipeline markers for distribution mains and transmission lines on both sides of railroad crossings in accordance with 49 CFR 192.707 and WAC 480-93-124. On September 29, 2006, NW Natural completed the replacement of damaged or missing pipeline markers at the above-referenced railroad crossings. Furthermore, during October 2006, NW Natural voluntarily initiated a self audit of all other railroad crossings in Clark County to ensure the adequacy of pipeline markers at railroad crossings.

In summary, NW Natural took immediate and decisive action to replace pipeline markers at the 5 locations referenced by Staff. In addition, the company voluntarily performed a self-audit of all other pertinent railroad crossings in Clark County to ensure the company's compliance with 49 CFR 192.707 and WAC 480-93-124.

9. WAC 480-93-170(7) Tests and Reports for Pipelines

(7) Operators must keep records of all pressure tests performed for the life of the pipeline and must document the following information:
- *(a) Operator's name;*
- *(b) Employee's name;*
- *(c) Test medium used;*
- *(d) Test pressure;*
- *(e) Test duration;*
- *(f) Pipe size and length;*
- *(g) Dates and times; and*
- *(h) Test results.*

Finding(s):

NWN records indicate that the following pipelines did not have properly documented pressure tests.

(a) W.O. #03106770 located at 5302 NE 22nd Ave., Vancouver WA, dated 10/14/2005. *Missing test medium used, test pressure, test duration, pipe length, time of test and test results.*

(b) W.O. #03106932 located at 3204 NE 36th Ave., Vancouver WA, dated 10/17/2005. *Missing test duration, pipe length, time of test and test results.*

(c) ***W.O. #03106481 located at 2302 S 17th Way, Apt. L26, Ridgefield WA, dated 10/22/2005.*** *Used pre-tested pipe with no supporting test records including employee's name, test medium used, test pressure, test duration, pipe size and length, dates and times and test results.*

(d) ***W.O. #03118370 located at 313 S 34th Pl., Ridgefield WA, dated 02/17/2006.*** *Missing test medium used, test pressure, test duration, time of test and test results.*

(e) ***W.O. #03109859 located at 3523 S 2nd Way, Ridgefield WA, dated 11/15/2005.*** *Missing test medium used, test pressure, test duration, time of test and test results.*

(f) ***W.O. #03111672 located at 3211 S 2nd Way, Ridgefield WA, dated 12/09/2005.*** *Missing test medium used, test pressure, test duration, time of test and test results.*

(g) ***W.O. #03123799 located at 665 NW Norwood St., Camas WA, dated 04/26/2006.*** *Missing test medium used, test pressure, test duration, time of test and test results.*

(h) ***W.O. #03064757 located at NE Pioneer St & 32nd Place, Ridgefield WA, dated 10/20/2005.*** *Missing test medium used, test duration, pipe size and length, dates and times and test results.*

Note: *According to NWN personnel this plat installation may have involved multiple pressure tests during the course of construction. If multiple pressure tests are conducted, NWN must document each individual pressure test as required by WAC 480-93-170(9).*

NW Natural response:

Although the referenced Work Orders were not entirely complete, they contained additional information required by WAC 480-93-170. The following is an explanation of the information that appears on the referenced Work Orders which was reported as missing:

Work Order #03106770 located at 5302 NE 22nd Ave., Vancouver WA, dated 10/14/05 (work completed on 10/14/05). The pipe length was documented. The REPORTS/REMARKS portion of the Work Order states NW Natural replaced 2 feet of pretested ½-inch PE pipe (Enclosure 12).

Work Order #03106932 located at 3204 NE 36th Ave., Vancouver WA, dated 10/17/05 (work completed on 10/17/05). The pipe length was documented. The REPORTS/REMARKS portion of the Work Order and the attached Report of Damage to Gasco Structures form under EXPLANATION REPAIRS MADE AND MATERIAL USED indicate NW Natural replaced 5 feet of pretested 1-inch PE pipe (Enclosure 13).

Work Order #03106481 located at 2302 S 17th Way, Apt. L26, Ridgefield WA, dated 10/12/05 (work completed on 10/13/05). The pipe length was documented. The REPORTS/REMARKS portion of the Work Order states NW Natural replaced 2 feet of pretested pipe (Enclosure 14).

Work Order #03109859 located at 3523 S 2nd Way, Ridgefield WA, dated 11/11/05 (work completed on 11/15/05). Test pressure was documented. The SERVICE TESTED AT portion of the Work Order indicates NW Natural installed and tested 28 feet of ½-inch PE pipe at 100 pounds (Enclosure 15).

Work Order #03111672 located at 3211 S 2nd Way, Ridgefield WA, dated 12/1/05 (work completed on 12/9/05). Test pressure was documented. The SERVICE TESTED AT portion of the Work Order documents NW Natural installed and tested 33 feet of PE pipe in 29 feet of casing at 100 pounds (Enclosure 16).

Work Order #03123799 located at 665 NW Norwood St., Camas WA, dated 04/17/06 (work completed on 4/26/06). Test pressure was documented. The SERVICE TESTED AT portion of the Work Order states NW Natural installed and tested 128 feet of PE pipe at 100 pounds (Enclosure 17).

Work Order #03064757 located at NE Pioneer St & 32nd Place, Ridgefield WA, dated 5/16/05 (work completed by NW Natural on 7/19/05 and Contractor Loy Clark on 10/20/05). The pipe length and test pressure were documented. The REPORTS/REMARKS and SERVICE TESTED AT portions of the Work Order indicate on July 19, 2006, NW Natural installed 6,675 feet of 4-inch PE pipe (in 538 feet of casing) and tested pipe segment at 100 pounds (Phase 1) (Enclosure 18). The REPORTS/REMARKS and SERVICE TESTED AT portions of the Work Order document on October 20, 2005, contractor Loy Clark installed 4,168 feet of 2-inch PE pipe and tested the pipe segment at 100 pounds (Enclosure 19).

During the inspection NW Natural became aware that enhancements were needed to facilitate the documentation of required pressure tests performed by field personnel. As a result, NW Natural has created a Damage Check List to provide direction for field personnel to consistently document the test medium, test duration, time of test, and test results information on the Work Order (Enclosure 20). This Check List is currently in use throughout the company. Relative to the performance of multiple pressure tests conducted during the course of construction, NW Natural has modified its construction drawings to facilitate the documentation of multiple pressure tests that may occur on a complex construction project (Enclosure 21). This change and associated processes were implemented on September 1, 2006.

In summary, NW Natural has taken appropriate action to modify existing forms and develop documentation check lists to ensure the consistent reporting of pressure test information in compliance with the requirements of WAC 480-93-170.

10. **WAC 480-93-188(4)(e) Gas Leak Surveys**

(4) Special leak surveys must be conducted under the following circumstances:

(e) After third-party excavation damage to services, operators must perform a gas leak survey from the point of damage to the service tie-in.

Finding(s):

NWN was unable to provide the required leak survey documentation for the following 2 pipelines which were damaged and leaking due to third party damage:

(a) W.O. #03106770 located at 5302 NE 22nd Ave., Vancouver WA, dated 10/14/2005.

(b) W.O. #03106932 located at 3204 NE 36th Ave., Vancouver WA, dated 10/17/2005.

NW Natural response:

As previously discussed in NW Natural's response to Probable Violation 9 above, the company has created a Damage Check List (Enclosure 20) for third-party excavation damages which directs field personnel to consistently perform and document a leak survey from the point of damage to the main. NW Natural believes these procedural changes satisfy Staff's concerns and ensure compliance with the special leak survey requirements of WAC 480-93-188(4)(e).

11. **WAC 480-93-178(4) Protection of Plastic Pipe**

(4) When installing plastic pipelines parallel to other underground utilities, operators must ensure there is a minimum of twelve inches of separation from the other utilities. Where a minimum twelve inches of separation is not possible, operators must take adequate precautions, such as inserting the plastic pipeline in conduit, to minimize any potential hazards resulting from the close proximity to the other utilities.

Finding(s):

On August 24, 2006, we observed the following ½-inch plastic new construction residential services in open ditches which did not have 12-inches of separation from other underground utilities. The services were direct buried without protection from hazards which could result from the close proximity of other utilities.

(a) 5911 NE 62nd St., Vancouver.

(b) 9117 NE 77 St., Vancouver.

NWN procedure No. SPW 253, dated 04/21/2006, also requires a minimum of 12-inches of horizontal separation or the use of conduits or other protection.

NW Natural response:

When NW Natural became aware of Staff's concerns, company personnel took corrective action as follows:

5911 NE 62nd Street, Vancouver. NW Natural re-excavated the ditch to evaluate the separation issues and relocated the service to achieve appropriate depth and separation from other utilities (Figure 6).

9117 NE 77 Street, Vancouver. In order to ensure adequate separation, NW Natural replaced the entire length of the service to another alignment (Figure 7).

The referenced ½-inch PE new construction residential services were installed as part of joint utility trench installations. NW Natural is committed to installing new service lines with appropriate depth and separation from other utilities. NW Natural's SPW 253, Polyethylene Pipe Installations (Enclosure 22), states the company's policy for the separation of PE pipe from other utilities as 12 inches of separation for parallel installations, and 6 inches of separation for perpendicular crossings. If these separations are not possible, adequate precautions will be taken such as encasing the pipe in conduit.

At the time of Staff's inspection and findings, the joint trench installations at 5911 NE 62nd Street and 9117 NE 77th Street, Vancouver were under construction. When NW Natural crews left these sites, there was no conflict with other utilities in the joint trench. Subsequent installations by other utilities resulted in the conflict with the company's separation standards. Since NW Natural is unable to control installations after the company's service lines are installed, and after consulting with Staff, NW Natural proposes to revise the company's PE installation standards to require that all joint trench service installations in Washington include the use of conduit and a minimum of 2 inches of shading in order to provide protection against potential encroachments.

12. 49 CFR §192.361(a), Service Lines: Installation

(a) Depth. Each buried service line must be installed with at least 12 inches (305 millimeters) of cover in private property and at least 18 inches (457 millimeters) of cover in streets and roads. However, where an underground structure prevents installation at those depths, the service line must be able to withstand any anticipated external load.

Finding(s):

On August 24, 2006, we observed the following ½-inch plastic new construction residential services in open ditches which did not have the minimum of 12-inches of cover. The services had minimal dirt shading and were exposed in several locations.

a. 5911 NE 62nd St., Vancouver.

b. 5923 NE 62nd St., Vancouver.

c. 9117 NE 77 St., Vancouver.

NW Natural response:

Upon becoming aware of Staff's concerns, NW Natural took prompt corrective action as described in the company's response to Probable Violation 11 which addresses the same locations as items a. and c. above. In addition, at 5923 NE 62nd Street, Vancouver, the company took the following corrective action:

5923 NE 62nd Street, Vancouver. NW Natural relocated the PE service pipe to ensure adequate separation from other utilities as required by 49 CFR 192.361(a) (Figures 8 and 9).

NW Natural is committed to installing new service lines with appropriate depth and separation from other utilities. NW Natural agrees with Staff that the PE lines at the 3 above-referenced new construction sites require a minimum of 12 inches of cover at the completion of construction and backfill, and should have adequate dirt shading in the interim. However, it is important to note that these services were part of a joint trench installation with other utilities and that these locations were under construction. Based on the installation depths, the services would have been 22 to 24 inches deep when construction was complete and the ditch was backfilled to grade.

In order to protect service lines involved in joint trench installations in the future, the company proposes to install new residential services in conduit with a minimum of 2 inches

of shading prior to leaving the site. When the installation is completed and backfilled to final grade, the services will meet or exceed minimum requirements for cover and the conduit will provide protection from encroachment by other utilities.

Areas of Concern

1. *NWN Construction Field Manual, section CFM 606-2, dated March 2006, includes an Oxy-Acetylene process for welding using the rolled weld position. NWN qualifies all Oxy-Acetylene welders according to 49 CFR §192 Appendix C requirements. Appendix C is a fixed position test only and is not applicable to a rolled weld process. NWN can not conduct rolled welding with welders who have been qualified according to Appendix C requirements.*

NW Natural response:

NW Natural concurs with Staff that the test weld referenced in 49 CFR 192, Appendix C, specifies a horizontal fixed position. However, NW Natural believes that a rolled weld position is inherently easier than the fixed position. Therefore, if a welder successfully passes a weld test in the fixed position, the welder is also qualified to perform a weld in the easier rolled welding position. In response to Staff's concerns, NW Natural will review its oxyacetylene weld procedure, CFM 606-2, for compliance with 49 CFR 192, Appendix C.

Areas of Concern

2. *WAC 480-93-170(8) requires that "where feasible, operators must install and backfill plastic pipe prior to pressure testing to expose any potential damage that could have occurred during the installation and backfill process." On August 24, 2006, we observed the following ½-inch plastic new construction residential services in open ditches that did not have the minimum of 12-inches of cover. The services had minimal dirt shading and were exposed in several locations. The services had been pressure tested prior to being backfilled.*

   (a) 5911 NE 62nd St., Vancouver.

   (b) 5923 NE 62nd St., Vancouver.

   (c) 9117 NE 77 St., Vancouver.

NW Natural response:

NW Natural is committed to compliance with the provisions of WAC 480-93-170(8) regarding the installation and backfill of PE pipe prior to pressure testing where feasible. SPW 253 specifies NW Natural's policy for PE pipe installations and includes the company's procedures for complying with the provisions of WAC 480-93-170(8). Since NW Natural is also committed to installing services with adequate depth and separation, the company was concerned to learn that the referenced PE installations may not have had sufficient shading. NW Natural believes these installations were isolated incidents. As discussed in the company's response to Probable Violation 12, NW Natural took decisive action to bring those installations into conformance with the company's depth and separation requirements.

As noted in the company's response to Probable Violations 11 and 12, with Staff's concurrence, NW Natural proposes to install all new ½-inch PE residential services in conduit to provide protection during construction regarding depth, separation, and potential damage that could occur during the installation and backfill processes.

This report summarizes our activities in response to the pipeline safety audit of Clark County.

Sincerely,

Bruce L. Paskett, P.E.
Manager Code Compliance

Enclosures (22)

dtm437

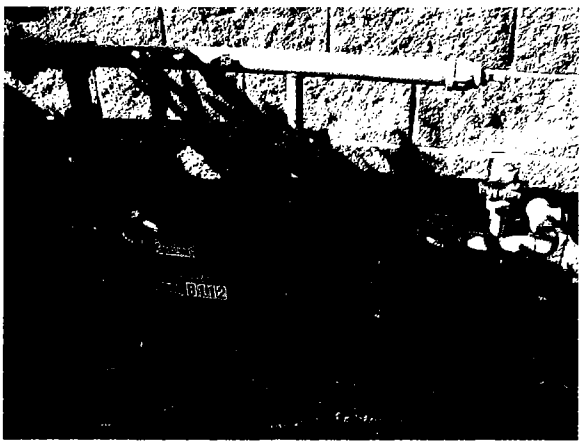


Figure 1. Meter #743434: Corrected regulator vent.

Figure 2. Meter #743434: Corrected regulator vent.

Figure 3. Meter #743434: Corrected regulator vent.

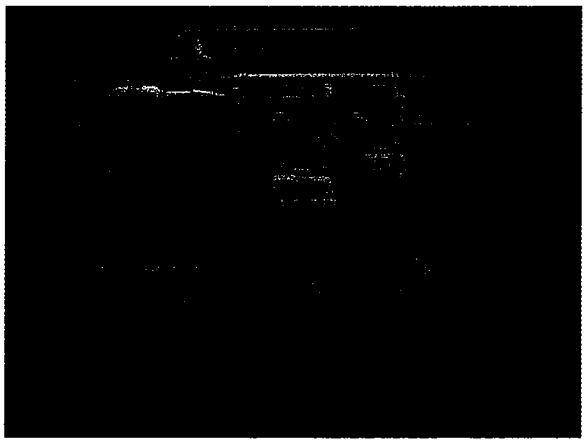


Figure 4. Meter #316080: Corrected regulator vent.

Figure 5. Meter #316080: Corrected regulator vent.

Figure 6. 5911 NE 62nd Street, Vancouver: Depicts approximately 20-inch separation between gas line and other utilities.

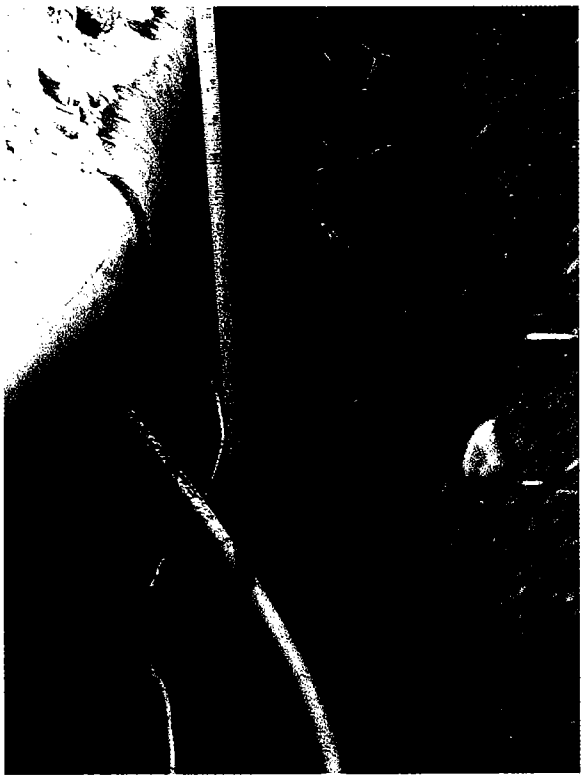


Figure 7. 9117 NE 77th Street, Vancouver: Depicts approximately 15-inch separation between gas line and other utilities.

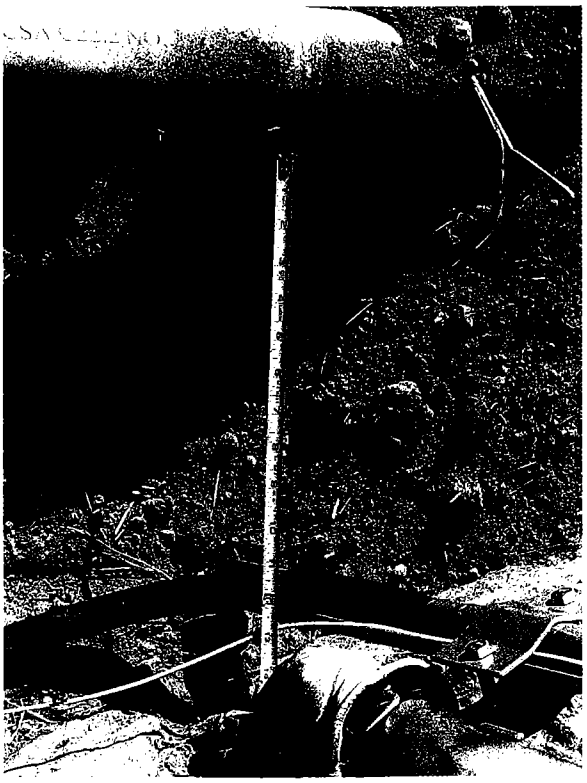


Figure 8. 5923 NE 62nd Street, Vancouver: Depicts approximately 12-inch separation between gas line and other utilities.

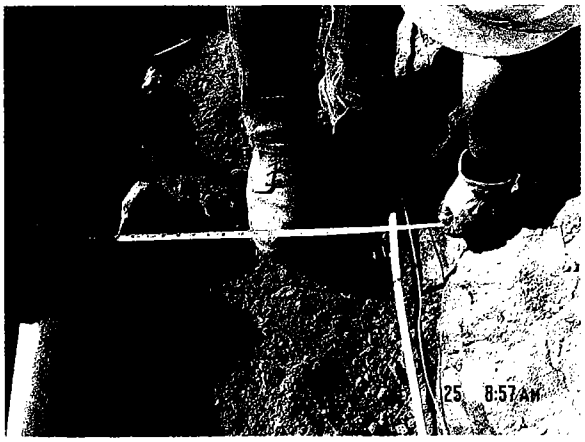


Figure 9. 5923 NE 62nd Street, Vancouver: Depicts approximately 19-inch separation between gas line and other utilities.

NW Natural

STANDARD PRACTICE – Washington
SPW 001

Title: Definitions

Revision: 08 (supersedes Rev. 07, 5/11/06) Approved: B. L. Paskett, 11/2/06

Reviewed: Reviewed:

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z

Note: Underlined words are linked electronically in the online version of the Standard Practices.

Numbers

49 CFR – U.S. Department of Transportation, Title 49, Code of Federal Regulations.

A

Abandoned service – A service that is disconnected from all sources of gas by separation from an active main or attachment to an unused (i.e., abandoned) main and is left in place. The service is capped or plugged below grade at the downstream end after purging.

Records of abandoned services are deleted from the Capital Assets ledger of the company, but they may be retained in some operational files where they have ongoing usefulness.

Abnormal operations – To be an abnormal operating condition, the condition must possibly indicate:

- a malfunction of a component, and/or
- a deviation from normal operations.

If it passes this test, then it must also

- indicate a condition exceeding design limits and/or
- result in a hazard(s) to persons, property, or the environment.

There are four components of this regulatory test. A condition need not pass all four tests to be an abnormal operating condition; it only must pass one of the two criteria in each of the two pairs of tests.

Active service – A service in active use.

Annually – Any time within the calendar year.

Anode – Normally a 3- or 17-pound bag of magnesium powder. The bag is connected by a wire to a steel pipeline and is used to transfer the rust or corrosion process from the pipeline to itself by a chemical process.

As-built drawing – A drawing or map of the pipeline or other facility showing the changes made during construction.

ATIC – Accident Technical Investigating Committee

B

Bar hole – A hole made in the soil or paving for the specific purpose of testing the subsurface atmosphere with a combustible gas indicator (CGI).

Blind washer – A washer without a hole in it; used to stop the flow of gas between two pieces of pipe.

Bridge line crossing – A gas pipeline exposed to atmosphere, without attached customer service equipment (meters or regulators), and mechanically attached to, or supported by, a structure spanning a body of water or topographical feature.

District regulator – A regulator station that reduces the pressure from a high-pressure pipeline to a lower pressure pipeline. District regulators may serve one or more services.

Domestic meter – A residential meter.

DOT – U. S. Department of Transportation, the federal agency that regulates natural gas distribution and other operations

DOT 49 CFR – U.S. Department of Transportation, Title 49, Code of Federal Regulations.

Downstream – Any point farther along in the direction of the flow of gas from a reference point.

E

Electrolysis – In a pipeline, the decomposition or destruction of the pipe wall by stray electrical current. Negative ions are transferred through the moist ground to the more passive ion section of the pipe.

Emergency – Any condition constituting an immediate danger to life or property, or a customer service outage.

Emergency shutdown of an LNG facility – An unplanned shutdown of an entire LNG facility or a major portion of an LNG facility because continued operation would be unsafe to the public, the operator, or the facility itself. Power outages or minor equipment malfunctions unrelated to gas hazards are not included.

Enclosed space – Any subsurface structure of sufficient size that could accommodate a person and within which gas could accumulate, such as vaults, catch basins, and manholes.

Engineering – Engineering Services and Storage Development department.

Engineering drawing – A drawing of a company station, meter, or other facility or component used for fabrication or construction.

Environmentally hazardous wastes (EHW) – Hazardous wastes that include, but are not limited to, unwanted or useless pesticides, pesticide residues in any form, or empty pesticide containers.

EOC – Emergency Operations Committee

Equipment changes – Substitutions, additions, or deletions that may affect the failure mode or the full-open capacity of regulators or relief valves. They include orifice changes but they do not include substitutions having the same size, make, model, and operating characteristics as the original items.

Excavation – Any operation in which earth, rock, or other material on or below the ground is moved or otherwise displaced by any means except sidewalk, road, and ditch maintenance less than 12 inches in depth that does not lower the road grade or original ditch flow line. Excavation does not include the tilling of soil for agricultural purposes conducted on private property that is not within the boundaries of a recorded right-of-way or easement for underground facilities.

Excess flow valve (EFV) – A safety device installed in a natural gas service line that is designed to limit the flow of gas in the event that the service line is damaged. The excess flow valve automatically resets when line service is repaired.

Expander plug – A stopper placed with a special tool in a pipe that expands to stop the flow of gas. It stays in place until removed with the same special tool.

Extended service piping – The welded steel piping connecting the meter to the regulator if they are installed in different locations.

Pipe Inspection Report – Form F-8391, a 4 by 6-inch card used to report the condition of existing polyethylene or steel pipelines and the type of surrounding soil. Also available on the Work Order form, F-8115.

Pipeline – All parts of those physical facilities through which gas moves in transportation, including pipe, valves, and other appurtenances attached to the pipe.

Pipeline facility – New and existing pipeline, rights-of-way, and any equipment, facility or building used in the transportation of gas or in the treatment of gas during the course of transportation.

Pipeline pressure classes (main classifications) – A rating system for the internal pressure in a pipeline:

Class	MAOP
A	12 inches of water column
B	1– 60 psig
C	61–175 psig
D	176–400 psig
E	401–720 psig
F	721 psig or more

Pitting – A localized reduction in wall thickness caused by corrosion

Plant drawing – A drawing or drawings showing various system details at a company facility such as a gas storage plant.

Plat – A drawing showing one-quarter of a square mile or section. A plat shows the exact location of our mains, services, valves, and street rights-of-way.

PLIDCO® – Pipe Line Development company; manufacturer of pipeline repair and maintenance fittings.

Polyethylene (PE) – Plastic pipe, usually yellow, used in natural gas distribution systems.

Potential – The electrical charge on a pipeline between the pipe and the ground.

Potholing – The process of digging a hole to observe the depth of the pipe.

Regulator setpoint – See *Setpoint*

Pressure test – A strength and leakage test of pipe in which the pipe is filled with air, inert gas (such as nitrogen), natural gas, or water; pressurized; and monitored for leaks or loss of pressure. The gases are normally used for pressures up to 100 psig; water is the testing medium for higher pressures.

Primary service regulator – A pressure-regulating device that reduces the delivery pressure from a high-pressure pipeline to a lower pressure pipeline. Primary service regulators serve a maximum of two services.

Prompt action – To dispatch qualified personnel without undue delay for the purpose of evaluating and, where necessary, abating an existing or probable hazard.

psi – Pounds per square inch (psig is implied).

psig – Pounds per square inch gauge (zero equals the ambient air pressure).

Purge – The process of cleaning out a pipeline of unwanted gas or air.

R

Ramp – A fixed sloped structure providing pedestrian access between portions of a moorage that are at different elevations.

Readily detectable odorant level – The lowest concentration of odorized gas in the atmosphere that can be unmistakably detected by an individual with an average sense of smell.

NW Natural

STANDARD PRACTICE – Washington

SPW 743

Title: District and Service Regulators

Revision: 08 (supersedes Rev. 07, 7/28/06) Approved: B. L. Paskett, 11/2/06

Reviewed: Reviewed:

1. SCOPE

This standard practice establishes the policy for installation, inspection, and maintenance of company district regulators, primary service regulators, and associated relief valves. It also sets the policy for authorizing and accomplishing equipment changes affecting the performance of district and service regulators and relief valves.

2. POLICY

Each distribution system that is supplied from a source of gas that is of a higher pressure than the maximum allowable operating pressure (MAOP) of that system must have an appropriately sized district or primary service regulator and adequate overpressure protection. Equipment materials, types, and pressure ratings must be appropriate for the systems and functions for which they are specified.

Set points for delivery pressures at district and primary service regulators must ensure the established MAOP of the downstream system is not exceeded, except during failure.

District and primary service regulators must be inspected at regular intervals to verify they are in satisfactory operating condition and protected to ensure continued reliable operation.

3. POLICY DETAIL

3.1 Installation Requirements

District regulators and primary service regulators will be installed at appropriate locations to reduce the pressure from a high-pressure pipeline to a lower pressure pipeline. Effective November 2, 2006:

- District regulators may serve one or more services.
- Primary service regulators serve a maximum of two services.

District and primary service regulators must be designed to meet the pressure, load, and other service conditions that will be experienced during normal operation of the system being served.

3.1.1 Inlet and Outlet Valves

All district and primary service regulator stations must be installed with both inlet and outlet valves. All valves must be secured to prevent unauthorized operation.

District Regulators

- On new installations, inlet valves must be installed a minimum of 25 feet upstream of the regulator valve, unless otherwise authorized by the Chief Engineer.
- On new installations, outlet valves must be installed immediately downstream of the relief valve. The outlet valve may not be placed between the district regulator and the relief valve.
- The piping downstream from a district regulator must be identified as a main.

NW Natural Trak-It III and Sensit Gold Calibration Records
Clark County - 2006

Trak-It III, 2271 - Placed in Service 1/1/06

Calibration Date/Time	Result
2/3/06 10:40 AM	Passed
3/16/06 9:10 AM	Passed
4/25/06 7:43 AM	Passed

Trak-It III, 2274 - Placed in Service 1/1/06

Calibration Date/Time	Result
2/21/06 8:41 AM	Passed
3/31/06 8:48 AM	Failed
3/31/06 8:51 AM	Failed
3/31/06 8:53 AM	Failed
4/3/06 5:32 AM	Failed
4/3/06 5:43 AM	Failed
4/3/06 10:31 AM	Passed
4/3/06 11:13 AM	Passed

Trak-It III, 2277 - Placed in Service 1/1/06

Calibration Date/Time	Result
2/3/06 10:22 AM	Failed
2/3/06 10:26 AM	Failed
2/6/06 6:48 AM	Passed
2/6/06 10:31 AM	Passed
3/1/06 8:35 AM	Passed
4/3/06 8:03 AM	Passed

Trak-It III, 2280

Calibration Date/Time	Result
1/9/06 9:10 AM	Failed
1/9/06 9:19 AM	Passed
2/3/06 10:35 AM	Passed
3/3/06 9:40 AM	Passed
3/3/06 9:44 AM	Passed
3/22/06 8:59 AM	Passed
4/1/06 12:00 AM	Removed from service

Trak-It III, 2356

Calibration Date/Time	Result
1/3/06 10:02 AM	Passed
1/4/06 9:02 AM	Passed
2/2/06 11:00 AM	Failed
2/2/06 11:01 AM	Failed
2/2/06 11:05 AM	Passed
2/2/06 11:13 AM	Passed
2/15/06 12:05 PM	Passed
3/21/06 12:00 PM	Passed
4/27/06 7:19 AM	Passed

NW Natural Trak-It III and Sensit Gold Calibration Records
Clark County - 2006

Trak-It III, 2375

Calibration Date/Time	Result
1/1/06 12:00 AM	Removed from service
2/3/06 8:46 AM	Passed
3/1/06 9:05 AM	Passed
4/3/06 7:06 AM	Passed

Sensit Gold 4619

Calibration Date/Time	Result
1/4/06 10:21 AM	Passed
1/31/06 6:37 PM	Passed
2/1/06 12:00 AM	Removed from service
3/7/06 9:06 AM	Passed
4/3/06 9:19 AM	Passed
4/13/06 8:31 AM	Passed

Sensit Gold 4631

Calibration Date/Time	Result
1/4/06 10:01 AM	Failed
1/4/06 10:05 AM	Passed
2/9/06 10:47 AM	Passed
3/15/06 11:50 AM	Passed
4/13/06 9:17 AM	Passed

Sensit Gold 4650

Calibration Date/Time	Result
1/9/06 8:58 AM	Passed
2/22/06 10:09 AM	Passed
3/10/06 5:41 PM	Passed
4/21/06 9:26 AM	Passed

Sensit Gold 5946

Calibration Date/Time	Result
1/5/06 5:36 PM	Passed
2/3/06 10:09 AM	Failed
2/3/06 10:15 AM	Passed
2/20/06 10:03 AM	Passed
3/3/06 9:50 AM	Passed
4/1/06 6:00 PM	Passed

Sensit Gold 5947

Calibration Date/Time	Result
1/26/06 10:51 AM	Passed
2/6/06 9:27 AM	Passed
3/23/06 7:22 AM	Passed
4/25/06 8:19 AM	Passed

J And N Enterprises, Inc.

Gas Detection Products

851 Transport Drive
Valparaiso, Indiana 46383 USA

Telephone: (219) 465-2700
Fax: (219) 465-2701

June 10, 2005

Julian Dobbie
CES Field Supervisor
NW Natural Gas
3123 Broadway NE
Salem, OR 97303

Re: Calibration and bump frequency for gas detection products

Dear Julian,

Thank you for your email referencing the questions that have arisen regarding the referenced subject matter. I am sure we can clear up any potential misunderstandings through this letter.

Your calibration on a 90 day basis is adequate for the products we are supplying to you (namely the Trak-It III and Sensit Gold instruments). When using the instrument for leaks basically each time you use it and expose it to gas confirms the functionality of the product. If no gas is found at all, the instrument should be functionally tested on gas by checking on a meter set or some other source of gas. A completely dead sensor will provide alerts on the display of the product.

Part of the safety built into the products includes two sensors measuring in the LEL range. If the primary LEL sensor has drifted or been contaminated the second sensor will take over all readings once it detects about 60%LEL. When you look at the information from the calibrator the drift can be viewed and prevent maintenance can be performed.

Our website includes calibration and testing information for many customers that don't know about instrument testing nor have implemented a regimented test routine such as NW Natural. We suggest for this type of customer, such as a fire department, that never seems to calibrate to perform a bump test prior to each use. It is the most practical for them.

If you have further questions please don't hesitate contacting me directly.

Kindest regards,
J And N Enterprises, Inc.

J. Scott Kleppe
President

NW Natural

STANDARD PRACTICE – Washington
SPW 737

Title: Leak Detectors and Gas Analyzers

Revision: 06 (supersedes Rev. 05, 1/25/06) Approved: B. L. Paskett, 6/12/06

Reviewed: Reviewed:

1. SCOPE

This standard practice establishes the requirements for the periodic accuracy testing and calibration of combustible gas leak detectors and gas analyzers.

2. POLICY

Combustible gas leak detectors and gas analyzers must be maintained, tested for accuracy, calibrated, and operated in accordance with the manufacturers' recommendations. The calibration equipment for leak detectors and gas analyzers must be tested in accordance with manufacturers' recommendations.

3. POLICY DETAIL

3.1 Accuracy Test and Calibration Frequency

The accuracy/calibration check and calibration frequency for each gas leak detector or gas analyzer should be based on the manufacturer's recommendation. If there are no manufacturer's recommendations, accuracy tests against a known concentration of gas must be conducted at least once each calendar month. Any instrument that fails its applicable tolerances must be calibrated or removed from service.

Instruments must be tested to verify calibration accuracy at the intervals listed in table 1.

- Trak-It and Sensit Gold combustible gas indicators (CGIs) are calibrated at the applicable center or district office using a Smart-Cal calibration device.
- For all other instruments, if the calibration is not within the required limits, the instrument is sent to the Tualatin or Exley Service Center for calibration.
- Any other means of calibration must be approved by the Chief Engineer.

Table 1. Instrument calibration and maintenance schedule

Instrument		Frequency	
Type	**Manufacturer**	**Accuracy/ Calibration**	**Maintenance Guidelines[1]**
Combustible Gas Indicator (CGI)	Trak-It Sensit Gold GMI	At 90-day intervals At 90-day intervals Daily	If calibration failure If calibration failure At 90-day intervals
Flame Ionization Unit (FI)	Detecto-Pak (DPIII and IV)	Weekly	At 90-day intervals
Multi-gas monitor	ATX620, TMX412	Before each use	Monthly

[1]Maintenance includes calibration adjustments and other standard instrument maintenance tasks. Listed intervals are general guidelines.

3.2 Calibration Devices

The manufacturer's documentation for the Smart-Cal calibration device (for calibrating Trak-It® and Sensit® Gold CGIs) states that the device does not require maintenance or calibration.

Other devices will be calibrated against a certified calibration gas.

3.2 Records

All accuracy test and calibration records must be retained for at least 5 years.

4. RELATED COMPANY INFORMATION

Instructions and maintenance manuals for combustible gas indicators, gas analyzers, and calibration devices used by the company.

5. REFERENCE CODES AND STANDARDS

WAC 480-93-188 – Gas leak surveys

DEPARTMENTAL AND DISTRICT RESPONSIBILITIES

Department	Responsibilities
Tualatin Service Center	• Provide for the calibration of CGI devices at required intervals (see calibration table, section 3.1). • Recalibrate the calibration devices at least once each calendar year. Exception: Smart-Cal does not require calibration.
Tualatin Service Center, Exley	• Provide for the repair of all company leak detectors and gas analyzers by qualified tool repair personnel, as needed. • Maintain an adequate supply of spare parts for the repair of leak detectors and gas analyzers. • Provide training in leak detector and gas analyzer calibration and repair procedures for all tool repair personnel. • Maintain user/location, accuracy test, calibration, and repair records for all company leak detectors and gas analyzers for 5 years.
All Districts and Areas	Ensure the instrument calibrations are performed as required.

NW Natural — Weld Procedure Specification No. WPO-310

For NW Natural	Welding of under 2⅜" OD butt weld pipe and fittings
Process	Oxyacetylene welding
Material	API 5LX, grade B
Diameter and wall thickness	< 2⅜" OD ≤ 0.500" wall thickness
Joint design	Butt
Filler metal and number of beads	1 bead Group 6, A5.2, RG 60 (Option: RG 65)
Electrical or flame characteristics	Neutral flame
Position	Fixed
Direction of welding	Uphill
Number of welders	1
Time lapse between passes	N/A (one pass)
Type and removal of lineup clamp	External clamp—removed after 50% of uniformly spaced root bead is completed
Cleaning and/or grinding	File, wire brush, and grinder
Preheat/stress relief	N/A
Shielding gas and flow rate	N/A
Shielding flux	N/A
Speed of travel	½ to ¾ in/min
Sketches and tabulation attached	See attached drawing B-00-106-A

Oxyacetylene Settings

Oxygen Pressure (lb)	Acetylene Pressure (lb)	Tip Size		
5–10	6–8	5 or 7		

Tested	June 13, 2006	Welder	S.W. Burg
Approved	June 13, 2006	Welding Supervisor	R. L. Dean
Adopted	June 13, 2006		

	Name	Date
Reviewed	George J. Lee	6/13/06
Reviewed		
Reviewed		
Reviewed		

NW Natural

Coupon Test Report for WPO-310

Date 6/13/2006
Location Portland
State Oregon
Welder Scott Burg
Welding time
Mean temperature
Weather conditions
Voltage
Welding machine type Smith torch
Filler metal A 5.2, RG 60
Reinforcement size
Pipe type and grade API 5XL, grade B
Wall thickness 0.154"

WPS No. WPO-310
Weld Position ☐ Roll ☑ Fixed
Mark
Time of day a.m.
Wind break used
Amperage
Welding machine size
Outside diameter 1⅞"

Test Parameters	1	2	3	4
Coupon stenciled				
Original specimen dimensions				
Original specimen area (in^2)				
Maximum load (lb)				
Tensile strength (psi)				
Fracture location				

☑ Procedure ☐ Welder
☐ Qualifying line test ☐ Line test
☑ Qualified ☐ Disqualified

Maximum tensile _____ Minimum tensile _____ Average tensile _____

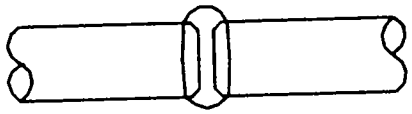
Remarks on tensile-strength tests
1.
2.
3.
4.

Remarks on bend tests Root-bend test
1. Acceptable
2.
3.
4.

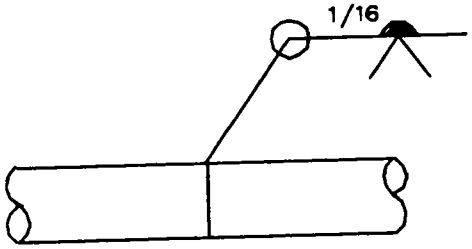
Remarks on nick-break tests
1. Clean
2.
3.
4.

Test made at Portland
Tested by Rick Dean
Date 6/13/2006
Supervised by R. L. Dean

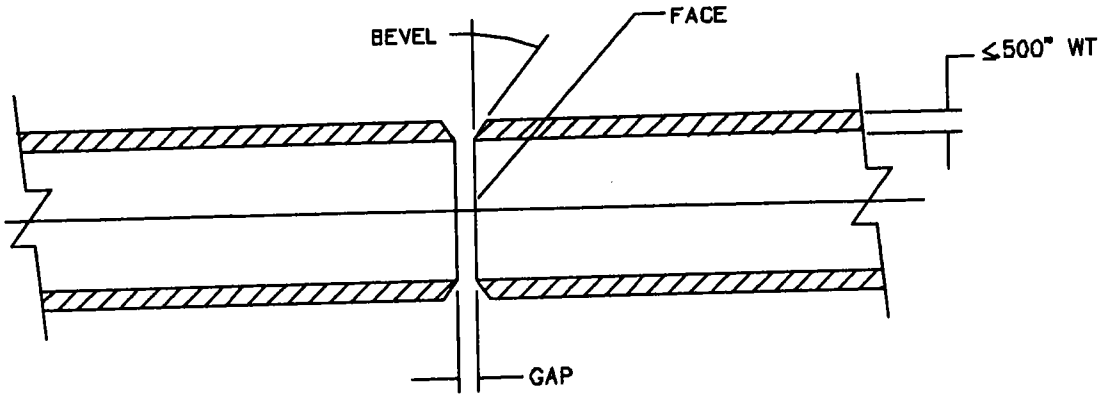
WPA-310



DESIRED WELD



SYMBOL



STANDARD "V" BEVEL BUTT JOINT

JOINT DESIGN:
ANGLE OF BEVEL = 30°
SIZE OF ROOT FACE = 1/16"
SPACING GAP = 1/8"

SYM.	DR.	APP.	REVISIONS	DATE
2	CSC	JCP	UPDATED W.T. SPECS	8/19/08
1			INITIAL RELEASE	

SYM.	DR.	APP.	REVISIONS	DATE

CH. DATE
APP. R. DEAN DATE 11/19/83
APP. MILLS DATE 3/14/84

NORTHWEST NATURAL GAS COMPANY
STANDARD PROCEDURE SPEC.
OXYACETYLENE WELDING OF SMALLER THAN 2-3/8"O.D.

DR. R.M. DATE 11/23/83
SCALE NONE
DWG. NO. B-00-106-A

Enclosure 7

F-8115
(Rev. 03/2006)

☐ MAIN ☒ SERVICE

WORK ORDER

PLAT 1-017-045(17-45)

DCS# 03 140073

EJL # -

CLASS	ACCOUNT	W.O. SUB.	CODE/SIZE	DATE
034	3208A	03140073	1	10/04/06

LOCATION

CITY	ADDRESS	COUNTY	PREMISE NUMBER
Vancouver	15602 SE MILL PLAIN Blvd	Clark	26472067
BETWEEN	AND	DATE APPLIED 10/02/06	DATE WANTED 10/06/06

NAME: TEAM CONSTRUCTION INC — CONTACT NAME — PHONE

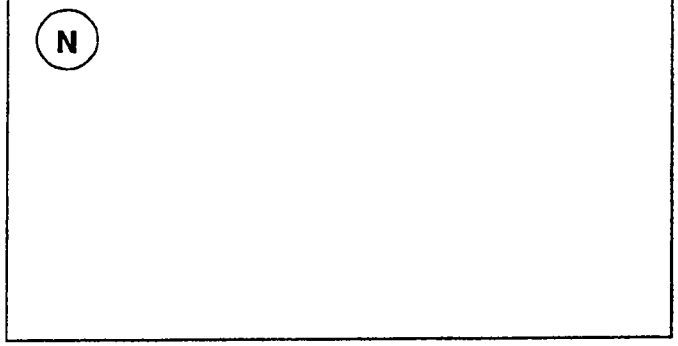
MAIN SIZE 2 TYPE P CLASS — MAIN IS ON — FT. LINE OF

SERVICE SIZE — FT. — OF — CURB VALVE — FT. ☐ INSIDE ☐ OUTSIDE

INSTRUCTIONS

HOME: (360)699-1477, BUS:

AS BUILT



INSTALLED	CASING	HOUSELINE	LOST

PIPE: ☐ PLASTIC ☐ COATED — SERVICE TESTED AT: ☐ 100Lbs. ☐ _____Lbs.

ANODE: ☐ 1 Lb ☐ 3 Lbs ☐ 17 Lbs

EXCESS FLOW VALVE: Lyall ☐ 475 ☐ 925 — UMAC ☐ 350 ☐ 700 ☐ 1800

☐ BONDED ☐ MAIN ☐ INSULATED ☐ CURB

☐ REPLACED ☐ RELINED

CURB VALVE INSTALLED? ☐ NO ☐ YES _____FT. ☐ IN ☐ OUT

REPORTS/REMARKS

CREW LEADER — DATE COMPLETED

PLATTED BY — DATE PLATTED

MAIN

DISPOSAL

RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE

PIPE INSPECTION

EXISTING PIPE SIZE_____ LENGTH EXPOSED_____FT. COVER _____IN. TO TOP OF PIPE

☐ PIPE ☐ FITTING ☐ OTHER _____

☐ MAIN ☐ SERVICE ☐ METER SET ☐ STATION

☐ STEEL ☐ CAST IRON ☐ POLY ☐ OTHER

☐ ABOVE GROUND ☐ BELOW GROUND

SOIL TYPE: ☐ SAND ☐ CLAY ☐ SOLID ROCK ☐ LOAM ☐ LOOSE ROCK

COVER: ☐ SOD ☐ GRAVEL ☐ ASPHALT ☐ CONCRETE

CORROSION TYPE: ☐ NONE ☐ GENERAL ☐ PITTING ☐ EROSION(Poly)

EXTENT: ☐ SEVERE ☐ MODERATE

SURFACE: ☐ INTERIOR ☐ EXTERIOR (of pipe)

COATING CONDITION: ☐ GOOD ☐ FAIR ☐ POOR

COATING TYPE: ☐ BARE ☐ BLUE ☐ TAPE WRAP ☐ BLACK (TAR) ☐ GREEN ☐ YELLOW (PE) ☐ OTHER: _____

PIT SIZE: DEPTH (Max.) _____ DIAMETER (Max.) _____

P/S Meas. _____ V — Name / Date _____ — Model / Ser. # _____

PRESSURE CLASS: ☐ A Low pressure ☐ B 1 to 60 psi ☐ C 61 to 175 psi ☐ D 176 to 400 psi ☐ E 401 to 720 psi ☐ F over 720 psi

COMMENTS:

CORROSION TEST SITE

TEST LEADS: ☐ LINE ☐ LINE CROSSING ☐ CALIBRATION ☐ INSULATOR ☐ CASING ☐ ANODE ☐ CPTL ☐ OTHER:_____ RECTIFIER ☐ YES ☐ NO

OTHER: ☐ METER SET ☐ CURB TILE ☐ VALVE ☐ TEST RISER ☐ REGULATOR ☐ VAULT ☐ CAGE ☐ CONDUIT ☐ LOCATE WIRE ☐ SQUARE BOX ☐ ROUND FRAME

LOCATION OF ANODE OR TEST LEADS:

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

Printed by LDS 10/4/2006 09:00:31

NW Natural

STANDARD PRACTICE – Washington
SPW 709

Title: Leak Classification and Repair, and Odor Call Response

Revision: 08 (supersedes Rev. 07, 12/22/05) Approved: B. L. Paskett, 7/28/06

Reviewed: Reviewed:

1. SCOPE

This standard practice outlines the classification system for leaks within the area served by the company; specifies criteria for leak identification, recording, and repair; and defines the company policy for response to odor calls.

2. POLICY

The company will maintain a program to locate, classify, and record gas leaks, and repair them as required by the classification standards. Company-qualified or company-approved personnel must classify all known leaks. Leaks discovered or reported to the company must be considered hazardous until classified and, thereafter, if warranted by their classifications.

Company personnel will respond promptly to reports of gas odor inside or near a building. Gas indications or leaks on lines not maintained by the company (e.g., marsh gas, transmission lines owned by others, bypass pipelines, customer-owned piping) must be reported to owners, company officials, or government officials, as appropriate.

3. POLICY DETAIL

3.1 Identification of Leaks

Company operating and contract personnel must locate and identify gas leaks using gas detection instruments by any or all methods which have proven to be effective, including but not necessarily limited to:

- Regulation-required leak surveys conducted in accordance with SPW 707.
- Promptly investigating any notification of a leak, explosion or fire involving gas facilities as reported by customers, other utilities, public authorities, or the general public.

3.2 Classification of Leaks

Identified underground leaks must be classified as Class A, B, or C based on present or potential hazard.

3.2.1 Class A Leaks

A Class A leak represents an existing or probable hazard to persons or property and requires immediate repair or continuous action until the conditions are no longer hazardous.

Response to a Grade A leak may require one or more of the following actions:

- Implementation of SPW 615, Basic Emergency Plan,
- Evacuating the premises,
- Blocking off an area,
- Rerouting traffic,
- Eliminating sources of ignition,

- Venting the area,
- Stopping the flow of gas by closing valves or other means, or
- Notifying the local police and/or fire department.

Grade A leaks requiring prompt action include, but are not limited to:

- Any leak that is regarded as an immediate hazard in the judgment of operating personnel at the scene,
- Escaping gas that has ignited unintentionally,
- Any indication of gas that has migrated into or under a building or tunnel,
- Any reading at the outside wall of a building or where the gas could potentially migrate to the outside wall of a building,
- Any reading of 80% LEL or greater in an enclosed space,
- Any reading of 80% LEL, or greater in small substructures not associated with gas facilities where the gas could potentially migrate to the outside wall of a building, or
- Any leak that can be seen, heard, or felt and that is in a location that may endanger the general public or property.

3.2.2 Class B Leaks

A Class B leak is non-hazardous at the time of detection but justifies scheduled repair based on potential future hazard.

Class B leaks must be repaired or cleared within 15 months from the date the leak is reported. If the applicable segment of pipeline is under consideration for replacement, an additional 6 months may be added to the required repair completion time (for a total of 21 months). The following criteria should be considered to determine repair priorities:

- Amount and migration of gas,
- Proximity of gas to buildings and subsurface structures,
- Extent of pavement, and
- Soil type and conditions, such as frost cap, moisture, and natural venting.

Based on the criteria, some Grade B leaks may require repair within 5 working days, others within 30 working days. Leakage personnel will notify the Leakage Engineer of Grade B leaks (if any) requiring repair prior to the 15-month routine schedule.

Class B leaks must be reevaluated at least once every 6 months until cleared. The frequency of reevaluation should be determined by the location and magnitude of the leakage condition.

Class B leaks requiring action within 6 months include, but are not limited to:

- In a wall-to-wall paved area that does not qualify as a Class A leak and where gas could potentially migrate to the outside wall of a building:
  - Any reading of 40% LEL or greater under a sidewalk
  - Any reading of 100% LEL or greater under a street

- Any reading less than 80% LEL in small substructures not associated with gas facilities and where gas could potentially migrate creating a probable future hazard,
- Any reading between 20% and 80% LEL in an enclosed space,
- Any reading on a pipeline operating at 30% SMYS or greater in Class 3 or 4 locations that does not qualify as a Class A leak, or
- Any leak that is of sufficient magnitude to justify scheduled repair.

3.2.3 Class C Leaks

A Class C leak is non-hazardous at the time of detection and can reasonably be expected to remain non-hazardous.

Class C leaks should be reevaluated during the next scheduled survey or within 15 months of the reporting date, whichever occurs first, until the leak is regraded or no longer results in a reading.

Class C leaks requiring reevaluation at periodic intervals include, but are not limited to:

- Any reading of less than 80% LEL in small gas-associated substructures, such as small meter boxes or gas valve boxes, or
- 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.

3.3 Concentration and Extent of Natural Gas Leak

When evaluating any leak, the concentration of gas and perimeter of the leak area must be determined, using a combustible gas indicator (CGI), and documented.

- If the perimeter of the leak extends to a building wall, the investigation must extend inside the building.
- Where the reading is in an unvented, enclosed space, the rate of dissipation when the space is ventilated and the rate of accumulation when the space is resealed must be considered.

3.4 Repair of Leaks

- Class A – Corrective action must begin immediately following identification and must continue uninterrupted until repairs are completed or safe conditions are otherwise established. No repair is complete until the gas spread is noticeably diminishing.

  An A leak must not be downgraded to B classification until made safe and confirmed with a final check using a combustible gas indicator.
- Class B – Repair must normally take place within 15 months of the original identification. This interval may be extended an additional 6 months (maximum of 21-months total) if the pipeline segment is scheduled for replacement, subject to the approval of the Chief Engineer. If a B leak is caused by corrosion on coated steel, further investigation by corrosion personnel must be undertaken.
- Class C – Repair is optional. Any accumulation of leakage in a small geographical area is cause for additional analysis.

Grade A and B leaks can only be downgraded once to a Grade C leak without a physical repair. After a leak has been downgraded once, the maximum repair time for that leak is 21 months.

3.5 Field Rechecks

A follow-up inspection of all leak repairs with residual gas remaining in the ground must be performed as soon as practical but not later than 30 days following the repair.

3.6 Leakage Records

Gas leak records must be prepared on company Form F-8185, Individual Leak Inspection Report, and retained for the life of the pipe. The leak records must contain sufficient data and information to permit the WUTC to assess the adequacy of NW Natural's leakage program including, at a minimum:

- Date and time the leak was detected, investigated, reported, and repaired, and the name of the employee(s) conducting the investigation;
- Location of the leak (sufficiently described to allow ready location by other qualified personnel),
- Leak grade,
- Pipeline classification (e.g., distribution, transmission, service),
- If reported by an outside party, the name and address of the reporting party,
- Component that leaked (e.g., pipe, tee, flange, valve),
- Size and material that leaked (e.g., steel, plastic, cast iron),
- Pipe condition,
- Type of repair,
- Leak cause,
- Date pipe installed (if known),
- Magnitude and location of CGI readings left, and
- Unique identification numbers (such as serial numbers) of leak detection equipment.

Effective June 2, 2005, records of the original leak, subsequent rechecks, repairs, and follow-up inspections will be retained for as long as the segment of the pipe remains in service.

3.7 Odor Calls

NW Natural will respond promptly to reports received from the public or public officials of a gas odor inside or near a building. Company personnel will generally arrive on site within 2 hours after receiving any call that necessitates investigation unless there are extenuating circumstances such as discharges from industrial locations.

3.8 Gas Leak Investigations – Leaks from Foreign Sources

When leak indications are found to originate from a foreign source or facility such as gasoline vapors, sewer, marsh gas, or from customer-owned piping, the company will take action for the protection of life and property.

For leaks presenting an on-going and potentially hazardous situation, the respondent to a leakage or odor call must notify the property owner or operator of the source facility of leak conditions, and where appropriate, the police department, fire department, or other applicable governmental agency.

- If the property owner or adult person occupying the premises is not available, the company will send a letter to the person occupying the premises explaining the results of the investigation within 24 hours of performing the leak investigation.

- Records of leak investigations must be forwarded to the Engineering department. A record of each letter sent must be retained for 5 years.

4. RELATED COMPANY INFORMATION

SPW 001 – Reporting Accidents and Incidents
SPW 615 – Basic Emergency Plan
SPW 707 – Leakage Survey Program

5. REFERENCE CODES AND STANDARDS

49 CFR 191 – Sections on annual reports and incident reports
49 CFR 192.605 – Procedural manual for operations, maintenance, and emergencies
49 CFR 192.705 – Transmission lines: Patrolling
49 CFR 192.706 – Transmission lines: Leakage surveys
49 CFR 192.709 – Transmission lines: Record keeping
49 CFR 192.721 – Distribution systems: Patrolling
49 CFR 192.723 – Distribution systems: Leakage surveys and procedures
WAC 480-93-185 – Gas leak investigation
WAC 480-93-186 – Leak evaluation
WAC 480-93-18601 – Leak classification and action criteria – Grade – Definition – Priority of leak repair
WAC 480-93-187 – Gas leak records
WAC 480-93-188 – Gas leak surveys
WAC 480-93-200 – Reporting requirements for operators of gas facilities

DEPARTMENTAL AND DISTRICT RESPONSIBILITIES

Department	Responsibilities
Engineering, Construction Services, Gas Supply, and Customer Equipment Services	• Provide suitable training in leak classification methods and techniques for departmental personnel assigned to this work. For gas indications or leaks on lines not maintained by the company, notify owners where possible with the assistance of the Risk Environment & Land department, and also notify Safety and CES, as needed, when further notification for fire marshals or other local government officials appears prudent. • For houseline leaks, owner notification must be accomplished using Form No. 6016. For leaks on Northwest Pipeline facilities, see responsibilities for Engineering and Gas Supply, below.
Engineering, Tualatin Service Center	• Conduct leak surveys. • Conduct leakage rechecks as indicated in this standard practice. • Investigate B leaks on coated steel for possible corrosion. • Respond to leak and odor calls as indicated in this standard practice and assist other departments as needed in their responses to leak and odor calls. • Maintain records concerning leaks upstream of company meters for all operating departments and initiate work orders for repair. • Maintain a marsh gas file. • Notify Northwest Pipeline of leaks on its underground piping discovered in the course of company leak surveys or other field operations. (continued)

Department	Responsibilities
Engineering, Tualatin Service Center (continued)	• Notify appropriate government officials when hazardous substances are suspected in leakage not involving company gas. • Audit departmental training procedures and actual leak classification work for leaks upstream of meter outlets. • Maintain records of leak investigations and notification.
Construction Services/Tualatin Regional Service Center	• Conduct leak surveys on transmission lines as specified in SP 707. • Accomplish emergency leak repairs and scheduled repairs as needed. • Initiate leak reports and/or repair records for leaks found or repaired in the course of field activities, and forward to Engineering. • Respond to after-hours leak and odor calls.
Gas Supply	• Repair leaks on district regulators, industrial meter sets, odorizers, and on station piping and fittings. • Monitor pressure and flow charts, and advise appropriate personnel of any unusual conditions which could indicate a leak or line break. • Analyze gas samples to determine origin as needed. • Notify Northwest Pipeline of leaks on its station piping discovered or reported to the company.
Customer Equipment Services	• Respond to leak and odor calls primarily on the downstream side of the meter set or within dwellings or other structures. • Initiate Form 6400/6500 for leaks upstream of company meters discovered and repaired by departmental personnel in the course of normal field activities and/or referred to the Construction Services for repair.
Districts	Accomplish the activities as shown for Engineering, Construction Services, Gas Supply, and Customer Equipment Services with qualified personnel and flexible departmental boundaries.
Risk, Environment and Land	• Provide written notification to appropriate governmental officials when advised by an Operations Supervisor of a hazard not involving company gas. • Maintain records of notification.

Leak Classification Guide—Classification Criteria

Leakage Condition	Hazardous	Non-Hazardous	
	Class A	Class B	Class C
	A leak that represents an existing or probable hazard to persons or property and requires immediate repair or continuous action until conditions are no longer hazardous.	A leak that is non-hazardous but justifies scheduled repair. May be reevaluated at intervals less than 90 days not to exceed 6 months and scheduled for repair within 15 months, unless otherwise indicated.	A leak that is non-hazardous and can reasonably be expected to remain unchanged until the next scheduled check. May be re-evaluated at intervals less than 14 months, not to exceed 15 months until repaired, replaced, or reclassified.
Gas ignited unintentionally	Yes	N/A	N/A
Gas migrating into or under a building or in a tunnel	Any indication	N/A	N/A
Gas in vicinity of building wall	At building wall or likely to migrate there—any reading	• 2% absolute (40% LEL) or greater under sidewalk in Business Area and likely to spread to building foundation,* or • Within 10 feet of, but not at, a building, or • Likely to migrate to outside of building in frozen conditions**	• Less than 2% absolute (40% LEL) under sidewalk in Business Area and not any closer than 10 feet to building foundation, • Any reading in area without wall-to-wall paving
Gas in non-gas utility or sewer manhole or any confined space	3% absolute (60% LEL) or greater	Reading between: 1% absolute (20% LEL) and 3% absolute (60% LEL), where gas is likely to migrate and create a hazard*	Less than 1% absolute (20% LEL)
Gas under street, or Leak on valve or curb valve	Leak can be seen, heard, or felt, and in a location that may endanger persons or property	Not Class A leak, in wall-to-wall paved area, 5% absolute (100% LEL), and likely to migrate*	Any reading in area without wall-to-wall paving, unlikely to migrate to outside wall of building
Leak on transmission line	Any reading in a Class 3 or 4 Location	Any reading in a Class 1 or 2 Location	N/A
Leak in company vault	Any reading of 4% (80% LEL) or greater	Reading between 1% (20% LEL) and 4% (80% LEL)	Any reading less than 1% absolute (20% LEL)
Gas at major stations or on plant property	Leak can be seen, heard, or felt, and in a location that may endanger persons or property	Moderate odor, and non-hazardous to personnel or property	Occasional or slight odor, and non-hazardous to personnel or property
Gas affecting vegetation only	N/A	Moderate damage in congested area, e.g., residential area	Appreciable damage in remote area
Gas odor in air	Strong odor, or leak can be seen, heard, or felt, and in location that may endanger general public/property	Moderate odor, and non-hazardous to personnel or property	Occasional or slight odor, and non-hazardous to personnel or property

*Requires action within 6 months.

**Requires action ahead of ground freezing or other adverse changes in venting conditions.

GMI NEW

Enclosure 9

DAILY LOG FOR
LEAKAGE DETECTION EQUIPMENT

Employee: MIKE MEDVEC
(Printed Name)

#P035276

	Date	DP-3	DP-4	GMI	CGI			Serial No.	Comments	Initials
1	3-17-06			X				4442		
2	3-27-06			X				4442		
3	3-29-06			X				4442		
4	4-6-06			X				4442		
5	4-14-06			X				4442		
6	5-1-06			X				4442		
7	5-12-06			X				4442		
8	5-22-06			X				4175	LOANER	
9	5-26-06			X				4175	LOANER	
10	6-8-06			X				4175	LOANER	
11	6-16-06			X				4175	LOANER	
12	6-29-06			X				4175	LOANER	
13	7-2-06			X				4175	LOANER	
14	7-17-06			X				4175	LOANER	

Enclosure 10

DAILY LOG FOR
LEAKAGE DETECTION EQUIPMENT

Employee: MIKE MEDVEC
(Printed Name)

	Date	DP-3	DP-4	GMI	CGI			Serial No.	Comments	Initials
1	9-7-05			X				4442		
2	9-23-05			X				4442		
3	10-3-05			X				4442		
4	10-12-05			X				4442		
5	10-21-05			X				4442		
6	11-16-05			X				4442		
7	11-21-05			X				4442		
8	11-29-05			X				4442		
9	1-16-06			X				4442		
10	1-24-06			X				4442		
11	1-30-06			X				4442		
12	2-9-06			X				4442		
13	2-28-06			X				4442		
14	3-14-06			X				4442		

NW Natural

STANDARD PRACTICE – Washington
SPW 705

Title: Pipeline Markers

Revision: 04 (supersedes Rev. 03, 11/8/04) Approved: B. L. Paskett, 12/6/05

Reviewed: Reviewed:

1. SCOPE

   This standard practice sets forth the policy for design, location, and maintenance of line marker signs to identify company distribution mains and transmission lines.

2. POLICY

   The location of company distribution mains and transmission lines must be marked as shown in section 3, with line markers placed and maintained as close as practical to each above- and below-ground line to reduce the possibility of damage or interference.

   The company will have maps, drawings, or other sufficient records indicating class locations and other areas where pipeline markers are required.

3. POLICY DETAIL

   3.1 Buried Pipelines

   For distribution mains and transmission lines in Class 1 and 2 locations, pipeline markers must be placed at all railroad, road, irrigation, and drainage ditch crossings, and at all fence lines where a pipeline crosses private property, or where a pipeline or pipeline facility is exposed.

   In other locations, the following pipelines must have pipeline markers installed, notwithstanding any exceptions in §192.707(b):

   - Where practical, on all mains operating above 250 psig,
   - On both sides of crossings of navigable waterways,
   - On both sides of river, creek, or irrigation-canal crossings where hydraulic scouring, dredging, or other activity could pose a risk to the pipeline, and
   - On both sides of railroad crossings.

   3.2 Aboveground Pipelines

   Line markers must be located at each pipeline section placed in an area that is accessible to the public.

   3.3 River Crossings

   Special line markers must be installed at river crossings, as needed, upon the recommendation of the Engineering department, Pipeline Services crew, or specialty construction and maintenance crew.

   3.4 Pipelines Attached to Bridges

   Markers indicating the presence of a natural gas pipeline will be installed at each end of a bridge, non-floating dock, or other spanned area. The pipeline itself will not be marked. For inspection intervals, refer to SPW 721, Bridge Lines and Non-floating Docks.

3.5 Spacing

For buried mains and transmission lines, pipeline markers must be placed approximately 500 yards apart, if practical, and at points of horizontal deflection of the pipeline.

3.6 Line Marker Design

Line marker posts and discs must be designed with a background color that sharply contrasts with wording color. The line marker identification label must consist of the following words: "Caution," "Warning," or "Danger," followed by "Natural Gas Pipeline."

The company name and a telephone number, including area code, to call before digging or in the event of an emergency must also appear on the marker.

Letters must be at least 1-inch high using a ¼-inch brush stroke, except for marker discs in heavily developed urban areas where the lettering can be smaller.

3.7 Casing Vents

Casing vents, when used as pipeline markers, must be marked in accordance with section 3.6.

3.8 Inspections

Surveys of pipeline markers (except those in section 3.4) must be conducted as frequently as necessary, but at intervals not to exceed 5 years, to maintain the markers and ensure they are visible and legible.

Markers that are reported damaged or missing must be replaced within 45 days.

3.9 Records

Survey records must be retained for at least 10 years.

4. RELATED COMPANY INFORMATION

SPW 053 – Qualification of Equipment, Materials, and Tools
SPW 703 – Patrolling Transmission and Distribution Lines
SPW 721 – Bridge Lines and Non-floating Docks

5. REFERENCE CODES AND STANDARDS

49 CFR 192.5 – Class locations
49 CFR 192.707 – Line markers for mains and transmission lines
WAC 480-93-124 – Pipeline markers

DEPARTMENTAL AND DISTRICT RESPONSIBILITIES

Department	Responsibilities
Engineering, Tualatin Regional Service Center	In conjunction with the Pipeline Services Supervisor, design special markers for waterway crossings as required.
Districts	• Install and maintain pipeline markers in accordance with this standard practice. • Install and maintain waterway crossing markers as required.

Enclosure 12

F-9116
(Rev. 01/2001)

☐ MAIN ☒ SERVICE

WORK ORDER

PLAT 1-011-032(11-32)

DOS# 03 106770

E.I. # –

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE
034	326 A	03106770	1/2	10/14/05

LOCATION

CITY	ADDRESS	COUNTY	PREMISE NUMBER
Vancouver	5302 NE 22ND AVE	Clark	
BETWEEN NE 54TH ST	AND	DATE APPLIED 10/14/05	DATE WANTED 10/15/05

NAME PARKER, PHILIP - 360-695-7514 CONTACT NAME PHONE

MAIN SIZE 2 TYPE P CLASS B MAIN IS ON FT. LINE OF

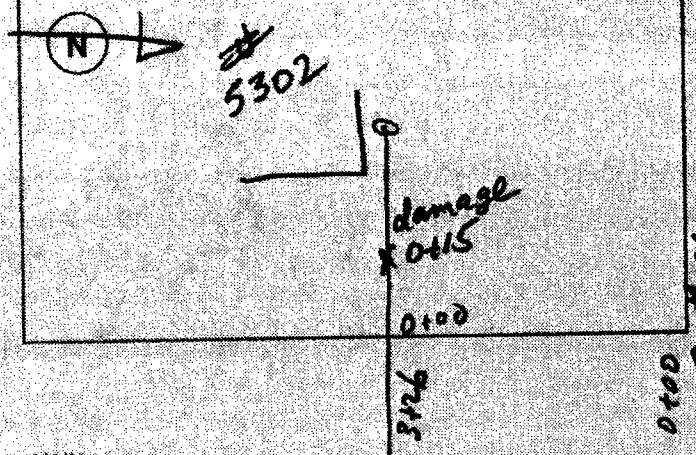
SERVICE SIZE FT. OF CURB COCK FT. ☐ INSIDE ☐ OUTSIDE

INSTRUCTIONS 99

OCT 18 2005

HOME: --, BUS:

AS BUILT



MAIN NE. 22nd AVE

INSTALLED	CASING	HOUSELINE	LOST

PIPE ☐ PLASTIC ☐ COATED — SERVICE TESTED AT ☐ 100Lbs. ☐ Lbs.

ANODE ☐ 1 Lb ☐ 3 Lbs ☐ 17 Lbs — EXCESS FLOW VALVE Lyall ☐ 475 ☐ 925 UMAC ☐ 350 ☐ 700 ☐ 1800 — ☐ BONDED ☐ MAIN ☐ INSULATED ☐ CURB

☐ REPLACED ☐ RELINED — CURB COCK INSTALLED? ☐ NO ☐ YES FT. ☐ IN ☐ OUT

REPORTS/REMARKS

Replaced 2' of ½ Poly
TESTED From damage to Riser.
Tested coupling at Line Pressure

CREW LEADER	DATE COMPLETED
R. Grable	10/14/05
PLATTED BY	DATE PLATTED

	RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE
Disposal											

PIPE INSPECTION

EXISTING PIPE SIZE ½ P LENGTH EXPOSED 5 FT. COVER 18" IN. TO TOP OF PIPE

☒ PIPE ☐ FITTING ☐ OTHER	☐ MAIN ☒ SERVICE ☐ METER SET ☐ STATION	☐ STEEL ☐ CAST IRON ☒ POLY ☐ OTHER	☐ ABOVE GROUND ☒ BELOW GROUND	SOIL TYPE ☐ SAND ☒ LOAM ☐ CLAY ☐ LOOSE ☐ SOLID ROCK ☐ ROCK	COVER ☒ SOD ☐ GRAVEL ☐ ASPHALT ☐ CONCRETE

CORROSION TYPE	EXTENT	COATING CONDITION	COATING TYPE	PRESSURE CLASS
☒ NONE ☐ GENERAL ☐ PITTING ☐ EROSION(Poly)	☐ SEVERE ☐ MODERATE	☐ GOOD ☐ FAIR ☐ POOR	☐ BARE ☐ BLUE ☐ TAPE WRAP ☐ BLACK (TAR) ☐ GREEN ☐ YELLOW (PE) ☐ OTHER	☐ A Low pressure ☒ B 1 to 60 psi ☐ C 61 to 175 psi ☐ D 176 to 400 psi ☐ E 401 to 720 psi ☐ F over 720 psi

SURFACE: ☐ INTERIOR ☐ EXTERIOR (of pipe)

PIT SIZE DEPTH (Max.) DIAMETER (Max.)

COMMENTS:

CORROSION TEST SITE

TEST LEADS: ☐ LINE ☐ LINE CROSSING ☐ CALIBRATION ☐ INSULATOR ☐ CASING ☐ ANODE ☐ CPTL ☐ OTHER: RECTIFIER ☐ YES ☐ NO

OTHER: ☐ METER SET ☐ CURB TILE ☐ VALVE ☐ TEST RISER ☐ REGULATOR ☐ VAULT ☐ CAGE

☐ CONDUIT ☐ LOCATE WIRE ☐ SQUARE BOX ☐ ROUND FRAME

LOCATION OF ANODE OR TEST LEADS:

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

Printed by W2M 10/14/2005 13:03

ORT OF DAMAGE TO GASCO STRUCTURES

CLAIM NO. 05-P-047245-G

ADDRESS WHERE DAMAGE OCCURRED: 5302 NE 22nd AVE

CITY: VANC ZIP: CSG 98663

PLAT ID: 1-011-032

WORK REQUEST NO.: 03-106770

MON. 10 DAY 14 YEAR 05

NAME OF DAMAGING AGENCY: Phillip Parker 360-695-7514 - Home

DAMAGING AGENCY'S ADDRESS: 5302 NE 22nd AVE CITY: VANC 98663

EQUIP. OPERATOR'S NAME: Homeowner PRIME CONTRACTOR:

TIME YOU ARRIVED ON SITE: 2:00 PM HOW DEEP WAS IT WHERE HIT? 18" INCHES

MARK ONLY ONE BOX

TYPE AGENCY
- [ ] 1. CONTRACTOR
- [ ] 2. UTILITY
- [ ] 3. PLUMBER
- [x] 4. OCCUPANT
- [ ] 5. CITY
- [ ] 6. COUNTY
- [ ] 7. STATE
- [ ] 8. UNKNOWN
- [ ] 9. VEHICLE

- [ ] 1. SEWER MAIN
- [ ] 2. SEWER/SERVICE
- [ ] 3. WATER/MAIN
- [ ] 4. WATER/SERVICE
- [ ] 5. PHONE/MAIN
- [ ] 6. PHONE/SERVICE
- [ ] 7. ELECTRIC/MAIN
- [ ] 8. ELEC./SERVICE
- [ ] 9. GRADING LOT

TYPE WORK
- [ ] 10. DESIGN SURVEY
- [ ] 11. GRADING/STREET
- [ ] 12. WRECKING
- [ ] 13. DRIVEWAY
- [ ] 14. DRAIN/CULVERT
- [ ] 15. TV CABLE/MAIN
- [ ] 16. TV CABLE/SERVICE
- [ ] 17 DITCH CLEANING
- [ ] 18. POLE SETTING
- [x] 19. SPRINKLER/ LANDSCAPE
- [ ] 20. GAS/MAIN
- [ ] 21. GAS/SERVICE
- [ ] 22. CURB/SIDEWALK
- [ ] 23. BLDG. CONST.
- [ ] 24. OTHER (Explain) ____

TYPE EQUIP.
- [ ] 1. BACKHOE/TRACKHOE
- [x] 2. TRENCHER
- [ ] 3. GRADER
- [ ] 4. CAT.LOADER/BOBCAT
- [ ] 5. CABLE PLOW
- [ ] 6. AUGER
- [ ] 7. BORING EQUIPMENT
- [ ] 8. HAND TOOL
- [ ] 9. MISC. (Explain) ____

DAMAGED FACILITY
- [ ] 1. MAIN
- [x] 2. SERVICE
- [ ] 3. METER SET
- [ ] 4. RISER
- [ ] 5. MISC. (Explain) ____

TYPE DAMAGE
- [x] 1. BROKEN
- [ ] 2. BENT
- [ ] 3. COATING ONLY
- [ ] 4. SCRATCHED >10%

LOCATION
- [x] 1. INSIDE PL
- [ ] 2. OUTSIDE PL
- [ ] 3. EASEMENT

PRE-LOCATED (MARK ONE)
- [ ] 1. YES – CORRECT (Within 24")
- [ ] 2. YES – WRONG
- [ ] 3. NO VISIBLE MARKS
- [x] 4. NO LOCATE REQUESTED
- [ ] 5. UNKNOWN
- [ ] 6. OTHER (Explain) ____

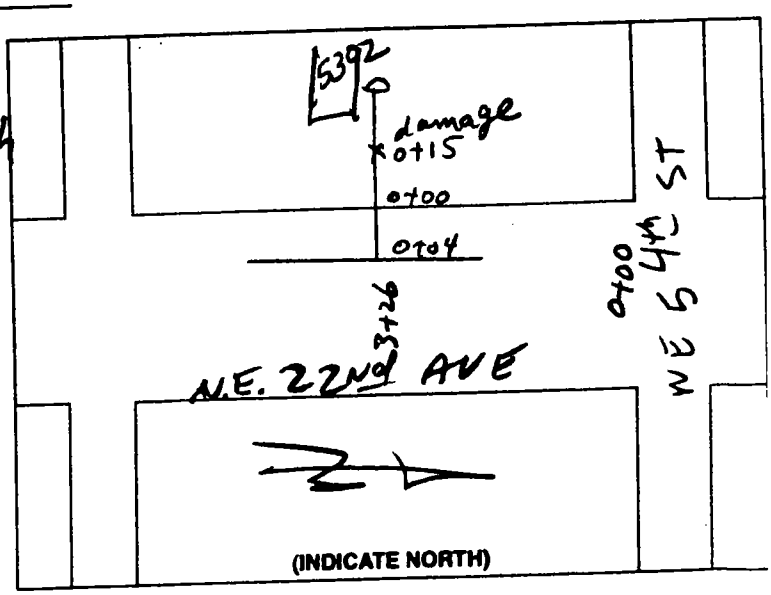
MATERIAL
- [x] 1. POLYETHYLENE
- [ ] 2. STEEL
- [ ] 3. CAST IRON

NUMBER OF CUSTOMERS AFFECTED: 01

GAS LOSS
- [ ] YES
- [x] NO

EXPLANATION OF DAMAGE (Draw a sketch):

Homeowner trenched through Yz P. service. No Locates Requested



Interviewing Supervisor's Signature

EXPLAIN REPAIRS MADE AND MATERIAL USED: 2 Ft of Yz preset poly - 2 + Yz permaserts 1-wire clip 1-MASTIC PAD Tested From Damage to Riser & Tested Coupling at Line pressure

CREW LEADER: R. Grable

CREW REPORT: DATE AND TIME ARRIVED:

EXPLAIN REPAIRS MADE AND MATERIALS USED:

REPORT OF FIRST CREW:

CREW SIZE 3

HOURS ON DAMAGE:

S.T. 1 1/2

O.T. _____

D.T. _____

EQUIPMENT (PLEASE CHECK OFF):

CREW VAN ✓

TRAILER ✓

COMPRESSOR _____

PICKUP _____

VAN _____

KUBOTA ✓

CO. BACKHOE _____

RENTAL BACKHOE _____

MINI TRACKHOE _____

REPORT OF SECOND CREW

CREW SIZE

HOURS ON DAMAGE:

S.T. _____

O.T. _____

D.T. _____

EQUIPMENT (PLEASE CHECK OFF):

CREW VAN _____

TRAILER _____

COMPRESSOR _____

PICKUP _____

VAN _____

KUBOTA _____

CO. BACKHOE _____

RENTAL BACKHOE _____

MINI TRACKHOE _____

MISC. EXPENSES:

PAVING CUT SIZE

SAND

GRAVEL

DUMP

CONCRETE _____

ADDITIONAL PERSONNEL:

WELDER _____ HRS. _____

FIELD DATA _____ HRS. _____

LEAKAGE INSP. _____ HRS _____

SERV. TECH. _____ HRS. _____

OFFICE USE ONLY

REASON FOR DAMAGE

1. FAILED TO REQ. LOC.
2. FAILED TO EXPOSE
3. FAILED TO PROTECT
4. CARELESS OPERATION
5. CHGD. GRADE W/O NOTICE
6. EXT. JOB W/O NOTICE
7. DIGGING OUT SOFT SPOTS
8. DITCH, SETTLE, OR CAVE-IN
9. EQUIP. PUMP. LINE UP
10. COMPANY ERROR
11. BUILDING WRECKING
12. VEH. OR EQUIP. HIT RISER OR METER SET
13. CONTRACT LOCATE ERROR

WHY WAS IT A COMPANY ERROR?

1. FIELD DATA MAN MISLOCATED
2. FIELD DATA MAN FAILED TO LOCATE
3. EXCAVATOR TOLD ALL CLEAR
4. FIELD DATA DID NOT RESPOND OR NOT SOON ENOUGH
5. NOT LOCATED DUE TO ERROR ON PLAT MAP
6. NOT CUT & PLUGGED AS REQUESTED
7. NOT DEEP ENOUGH FOR NEW GRADE
8. INSTALLED TOO SHALLOW

CREW LEADER COMMENTS:

Enclosure 13

535 4347

(16 Rev. 01/2001)

[X] MAIN [ ] SERVICE

WORK ORDER

PLAT 1-012-033(12-33)

DCS# 03 106932

E/L # -

OCT 18 2005 CCU

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE
034	126 A	03106932		10/17/05

LOCATION

CITY	ADDRESS	COUNTY	PREMISE NUMBER
Vancouver	3204 NE 36TH AVE	Clark	
BETWEEN	AND	DATE APPLIED 10/17/05	DATE WANTED 10/18/05

NAME CONTACT NAME PHONE

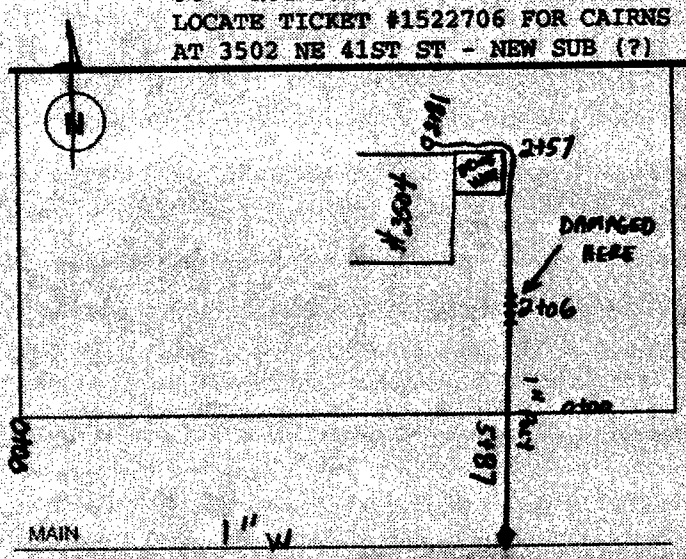
CAIRNS EXCAVATING - DAVID - 36

MAIN SIZE TYPE CLASS MAIN IS ON FT. LINE OF

SERVICE SIZE FT OF CURB COCK FT. [ ] INSIDE [ ] OUTSIDE

INSTRUCTIONS 98 - NOT CONFIRMED - BLOWING
LOCATE TICKET #1522706 FOR CAIRNS
AT 3502 NE 41ST ST - NEW SUB (?)

AS BUILT



MAIN 1" W

N.E. 41ST ST

INSTALLED	CASING	HOUSELINE	LOST
5' OF 1"	—		

PIPE: [ ] PLASTIC [ ] COATED — SERVICE TESTED AT: [ ] 100Lbs. [ ] Lbs.

ANODE: [ ] 1 Lb [ ] 3 Lbs [ ] 17 Lbs — EXCESS FLOW VALVE: Lyall [ ] 476 [ ] 925; UMAC [ ] 350 [ ] 700 [ ] 1600 — [ ] BONDED [ ] MAIN [ ] INSULATED [ ] CURB

[ ] REPLACED [ ] RELINED — CURB COCK INSTALLED? [ ] NO [ ] YES FT. [ ] IN [ ] OUT

REPORTS/REMARKS MADE REPAIR ON DAMAGED 1" INSTALLED 5' OF PROTECT POLY WITH 2 COMPRESSION COUPLINGS, SOAP TESTED AT LINE PRESSURE & ABTESTED SERVICE AT 100 psi

CREW LEADER A. QUINTERO — DATE COMPLETED 10-17-05

ENTERED BY SB — DATE PLATTED NOV 08 2005

RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE

NC 4/8

PIPE INSPECTION

EXISTING PIPE SIZE _____ LENGTH EXPOSED _____ FT. COVER _____ IN. TO TOP OF PIPE

[ ] PIPE [ ] FITTING [ ] OTHER _____

[ ] MAIN [ ] SERVICE [ ] METER SET [ ] STATION

[ ] STEEL [ ] CAST IRON [ ] POLY [ ] OTHER

[ ] ABOVE GROUND [ ] BELOW GROUND

SOIL TYPE: [ ] SAND [ ] CLAY [ ] SOLID ROCK [ ] LOAM [ ] LOOSE ROCK

COVER: [ ] SOD [ ] GRAVEL [ ] ASPHALT [ ] CONCRETE

CORROSION TYPE: [ ] NONE [ ] GENERAL [ ] PITTING [ ] EROSION(Poly)

EXTENT: [ ] SEVERE [ ] MODERATE

SURFACE: [ ] INTERIOR [ ] EXTERIOR (of pipe)

COATING CONDITION: [ ] GOOD [ ] FAIR [ ] POOR

COATING TYPE: [ ] BARE [ ] BLACK (TAR) [ ] BLUE [ ] GREEN [ ] TAPE WRAP [ ] YELLOW (PE) [ ] OTHER: _____

PIT SIZE DEPTH (Max.) _____ DIAMETER (Max.) _____

PRESSURE CLASS: [ ] A Low pressure [ ] B 1 to 60 psi [ ] C 61 to 175 psi [ ] D 176 to 400 psi [ ] E 401 to 720 psi [ ] F over 720 psi

COMMENTS:

CORROSION TEST SITE

TEST LEADS: [ ] LINE [ ] LINE CROSSING [ ] CALIBRATION [ ] INSULATOR [ ] CASING [ ] ANODE [ ] CP'TL [ ] OTHER: _____ RECTIFIER [ ] YES [ ] NO

OTHER: [ ] METER SET [ ] CURB TILE [ ] VALVE [ ] TEST RISER [ ] REGULATOR [ ] VAULT [ ] CAGE [ ] CONDUIT [ ] LOCATE WIRE [ ] SQUARE BOX [ ] ROUND FRAME

LOCATION OF ANODE OR TEST LEADS:

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

Printed by W2M 10/17/2005 10:40

REPORT OF DAMAGE TO GASCO STRUCTURES

CLAIM NO. 05-C-047246-6

ADDRESS WHERE DAMAGE OCCURRED: 3504 NE 36TH AVE PRT OR.

CITY: VANCOUVER ZIP: 98661 CSG

PLAT ID: 1-012-033

MON. 10 DAY 17 YEAR 05

WORK REQUEST NO. 03-106932

NAME OF DAMAGING AGENCY: CAIRNS BROTHER EXCAVING

DAMAGING AGENCY'S ADDRESS: 20800 NE 182ND AVE CITY: BATTLE GROUND

EQUIP. OPERATOR'S NAME: PARISH PRIME CONTRACTOR: DAVID CAIRNS

TIME YOU ARRIVED ON SITE: 11:10 HOW DEEP WAS IT WHERE HIT? 36" INCHES

MARK ONLY ONE BOX

TYPE AGENCY
- [X] 1. CONTRACTOR
- [ ] 2. UTILITY
- [ ] 3. PLUMBER
- [ ] 4. OCCUPANT
- [ ] 5. CITY
- [ ] 6. COUNTY
- [ ] 7. STATE
- [ ] 8. UNKNOWN
- [ ] 9. VEHICLE

TYPE WORK
- [X] 1. SEWER MAIN
- [ ] 2. SEWER/SERVICE
- [ ] 3. WATER/MAIN
- [ ] 4. WATER/SERVICE
- [ ] 5. PHONE/MAIN
- [ ] 6. PHONE/SERVICE
- [ ] 7. ELECTRIC/MAIN
- [ ] 8. ELEC./SERVICE
- [ ] 9. GRADING LOT
- [ ] 10. DESIGN SURVEY
- [ ] 11. GRADING/STREET
- [ ] 12. WRECKING
- [ ] 13. DRIVEWAY
- [ ] 14. DRAIN/CULVERT
- [ ] 15. TV CABLE/MAIN
- [ ] 16. TV CABLE/SERVICE
- [ ] 17. DITCH CLEANING
- [ ] 18. POLE SETTING
- [ ] 19. SPRINKLER/ LANDSCAPE
- [ ] 20. GAS/MAIN
- [ ] 21. GAS/SERVICE
- [ ] 22. CURB/SIDEWALK
- [ ] 23. BLDG. CONST.
- [ ] 24. OTHER (Explain) _____

TYPE EQUIP.
- [X] 1. BACKHOE/TRACKHOE
- [ ] 2. TRENCHER
- [ ] 3. GRADER
- [ ] 4. CAT.LOADER/BOBCAT
- [ ] 5. CABLE PLOW
- [ ] 6. AUGER
- [ ] 7. BORING EQUIPMENT
- [ ] 8. HAND TOOL
- [ ] 9. MISC. (Explain) _____

DAMAGED FACILITY
- [ ] 1. MAIN
- [X] 2. SERVICE
- [ ] 3. METER SET
- [ ] 4. RISER
- [ ] 5. MISC. (Explain) _____

TYPE DAMAGE
- [X] 1. BROKEN
- [ ] 2. BENT
- [ ] 3. COATING ONLY
- [ ] 4. SCRATCHED >10%

LOCATION
- [X] 1. INSIDE PL
- [ ] 2. OUTSIDE PL
- [ ] 3. EASEMENT

PRE-LOCATED (MARK ONE)
- [X] 1. YES – CORRECT (Within 24")
- [ ] 2. YES – WRONG
- [ ] 3. NO VISIBLE MARKS
- [ ] 4. NO LOCATE REQUESTED
- [ ] 5. UNKNOWN
- [ ] 6. OTHER (Explain) _____

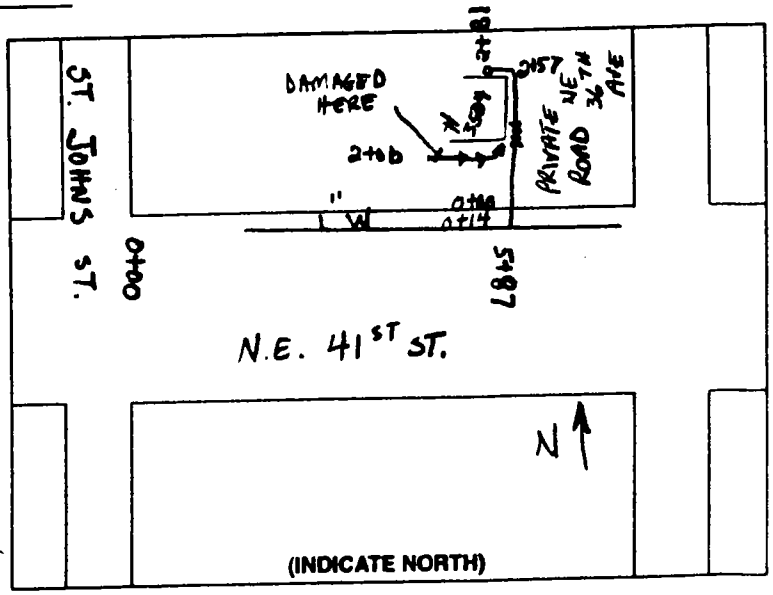
MATERIAL
- [X] 1. POLYETHYLENE
- [ ] 2. STEEL
- [ ] 3. CAST IRON

NUMBER OF CUSTOMERS AFFECTED: 01

GAS LOSS
- [ ] YES
- [ ] NO

EXPLANATION OF DAMAGE (Draw a sketch):

CONTRACTOR DIGGING FOR SEWER MAIN STRUCT OVR SERVICE 36" DEEP, HE KNEW IT WAS THERE BUT LOST TRACK OF IT. LOCATED BEFORE RAINS WASHED PAINT MARK AWAY.



Interviewing Supervisor's Signature: [signature]

EXPLAIN REPAIRS MADE AND MATERIAL USED: AIRTESTED FROM DAMAGED AREA TO RISER WITH 100 lbs PSI, MADE REPAIRS WITH 5' OF 1" PRETEST POLY, TWO PRESERT COUPLINGS, SOAP TEST AT LINE PRESSURE. WIRE OK.

CREW LEADER: A. QUINTERO

CREW REPORT: DATE AND TIME ARRIVED: 10-17-05 11:15 A.M.

EXPLAIN REPAIRS MADE AND MATERIALS USED:

REPORT OF FIRST CREW:

CREW SIZE 2

HOURS ON DAMAGE:

S.T. 2 1/2

O.T. _____

D.T. _____

EQUIPMENT (PLEASE CHECK OFF):

CREW VAN ✓

TRAILER ✓

COMPRESSOR ✓

PICKUP _____

VAN _____

KUBOTA ✓

CO. BACKHOE _____

RENTAL BACKHOE _____

MINI TRACKHOE _____

REPORT OF SECOND CREW:

CREW SIZE _____

HOURS ON DAMAGE:

S.T. _____

O.T. _____

D.T. _____

EQUIPMENT (PLEASE CHECK OFF):

CREW VAN _____

TRAILER _____

COMPRESSOR _____

PICKUP _____

VAN _____

KUBOTA _____

CO. BACKHOE _____

RENTAL BACKHOE _____

MINI TRACKHOE _____

MISC. EXPENSES:

PAVING _____ CUT SIZE _____

SAND _____

GRAVEL _____

DUMP _____

CONCRETE _____

ADDITIONAL PERSONNEL:

WELDER _____ HRS. _____

FIELD DATA _____ HRS. _____

LEAKAGE INSP. _____ HRS _____

SERV. TECH. _____ HRS. _____

OFFICE USE ONLY

REASON FOR DAMAGE

1. FAILED TO REQ. LOC.
2. FAILED TO EXPOSE
3. FAILED TO PROTECT
4. CARELESS OPERATION
5. CHGD. GRADE W/O NOTICE
6. EXT JOB W/O NOTICE
7. DIGGING OUT SOFT SPOTS
8. DITCH, SETTLE, OR CAVE-IN
9. EQUIP. PUMP. LINE UP
10. COMPANY ERROR
11. BUILDING WRECKING
12. VEH. OR EQUIP. HIT RISER OR METER SET
13. CONTRACT LOCATE ERROR

WHY WAS IT A COMPANY ERROR?

1. FIELD DATA MAN MISLOCATED
2. FIELD DATA MAN FAILED TO LOCATE
3. EXCAVATOR TOLD ALL CLEAR
4. FIELD DATA DID NOT RESPOND OR NOT SOON ENOUGH
5. NOT LOCATED DUE TO ERROR ON PLAT MAP
6. NOT CUT & PLUGGED AS REQUESTED
7. NOT DEEP ENOUGH FOR NEW GRADE
8. INSTALLED TOO SHALLOW

CREW LEADER COMMENTS: _____

Enclosure 14

F-8115
(Rev. 01/2001)

☐ MAIN ☒ SERVICE

WORK ORDER

PLAT 4-010-024(010-24)

DCS# 03 106481

EJL # -

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE
034	326 A	03106481	2	10/12/05

LOCATION

CITY	ADDRESS	COUNTY	PREMISE NUMBER
Ridgefield	2302 S 17TH WY. APT. L26	Clark	

BETWEEN	AND	DATE APPLIED	DATE WANTED
S 22ND PL		10/12/05	10/13/05

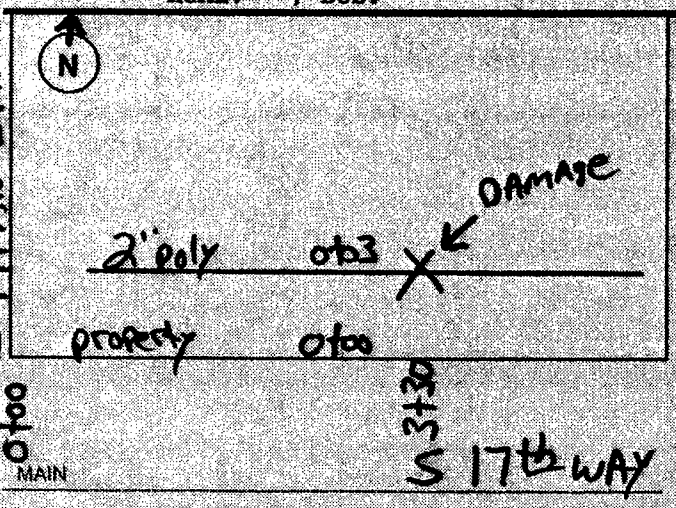
NAME	CONTACT NAME	PHONE
CASSINI VIEW		

MAIN SIZE 2	TYPE P	CLASS B	MAIN IS ON	FT. LINE OF
SERVICE SIZE	FT	OF	CURB COCK	FT ☐ INSIDE ☐ OUTSIDE

INSTRUCTIONS REPAIR 2" POLY MAIN

HOME: --, BUS:

AS BUILT



INSTALLED	CASING	HOUSELINE	LOST
2			

PIPE: ☒ PLASTIC ☐ COATED — SERVICE TESTED AT: ☐ 100Lbs. ☐ Lbs.

ANODE: ☐ 1 Lb ☐ 3 Lbs ☐ 17 Lbs — EXCESS FLOW VALVE: Lyall ☐ 475 ☐ 925; UMAC ☐ 350 ☐ 700 ☐ 1800 — ☐ BONDED ☐ MAIN ☐ INSULATED ☐ CURB

☐ REPLACED ☐ RELINED — CURB COCK INSTALLED? ☒ NO ☐ YES FT ☐ IN ☐ OUT

REPORTS/REMARKS: Fixed DAMAGE ON 2" POLY MAIN. 2' of pretested pipe, and 2 INNOGAZ Couplings tested At line Pressure

CREW LEADER	DATE COMPLETED
R. Boespflug	10-13-05

PLATTED BY SB — DATE PLATTED OCT 27 2005

DISCARD	RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE
											NC

PIPE INSPECTION

EXISTING PIPE SIZE 2" — LENGTH EXPOSED 3' FT. — COVER 36" IN. TO TOP OF PIPE

☒ PIPE ☐ FITTING ☐ OTHER	☒ MAIN ☐ SERVICE ☐ METER SET ☐ STATION	☐ STEEL ☐ CAST IRON ☒ POLY ☐ OTHER	☐ ABOVE GROUND ☒ BELOW GROUND	SOIL TYPE: ☐ SAND ☒ CLAY ☐ SOLID ROCK ☐ LOAM ☐ LOOSE ROCK	COVER: ☐ SOD ☐ GRAVEL ☐ ASPHALT ☐ CONCRETE

CORROSION TYPE	EXTENT	COATING CONDITION	COATING TYPE	PRESSURE CLASS
☒ NONE ☐ GENERAL ☐ PITTING ☐ EROSION(Poly)	☐ SEVERE ☐ MODERATE	☒ GOOD ☐ FAIR ☐ POOR	☐ BARE ☐ BLUE ☐ TAPE WRAP ☐ BLACK (TAR) ☐ GREEN ☐ YELLOW (PE) ☒ OTHER: poly	☐ A Low pressure ☒ B 1 to 60 psi ☐ C 61 to 175 psi ☐ D 176 to 400 psi ☐ E 401 to 720 psi ☐ F over 720 psi

SURFACE: ☐ INTERIOR ☐ EXTERIOR (of pipe)

PIT SIZE — DEPTH (Max.) — DIAMETER (Max.)

COMMENTS:

CORROSION TEST SITE

TEST LEADS: ☐ LINE ☐ LINE CROSSING ☐ CALIBRATION ☐ INSULATOR ☐ CASING ☐ ANODE ☐ CPTL ☐ OTHER — RECTIFIER ☐ YES ☐ NO

OTHER: ☐ METER SET ☐ CURB TILE ☐ VALVE ☐ TEST RISER ☐ REGULATOR ☐ VAULT ☐ CAGE ☐ CONDUIT ☐ LOCATE WIRE ☐ SQUARE BOX ☐ ROUND FRAME

LOCATION OF ANODE OR TEST LEADS

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

_____ FT. _____ OF _____ P.L. OR C.L. OF _____

Printed by W2M 10/12/2005 13:21:

Enclosure 15

PLAT 4-011-025(011-25) 2

DCS# 03 109859

EJL #

F-8115 (Rev. 01/2001)

WORK ORDER

☐ MAIN ☒ SERVICE

5386788 11-17 LOCATION

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE
034	3207A	03109859	1/2	11/11/05

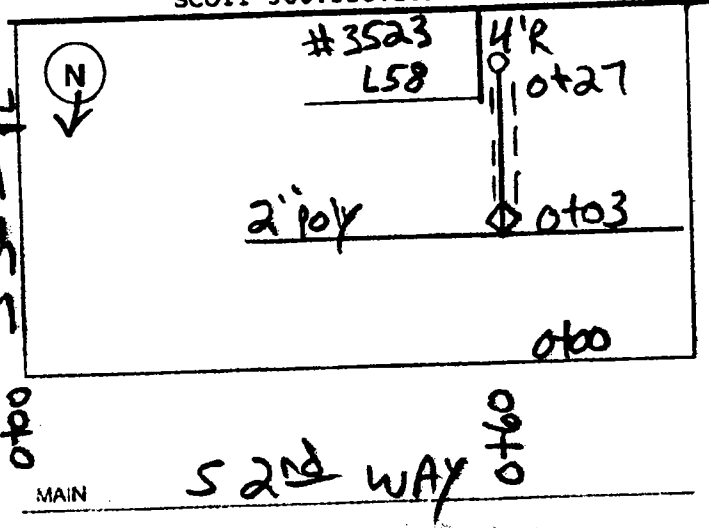
CITY: Ridgefield
ADDRESS: 3523 S 2ND Way
AND: S 35TH AVE
BETWEEN: L58 CEDAR RIDGE
COUNTY: Clark
PREMISE NUMBER: 26453554
DATE APPLIED: 11/11/05
DATE WANTED: 11/18/05
NAME: SUN COUNTRY HOMES
CONTACT NAME
PHONE

RECEIVED NOV 21 2005 ENGR DEPT

MAIN SIZE 2 TYPE P CLASS B
MAIN IS ON FT. LINE OF
SERVICE SIZE FT OF
CURB COCK FT. ☐ INSIDE ☐ OUTSIDE

INSTRUCTIONS: OP/ GA SIDE
OP1115 DD1116
SCOTT 360.518.1097

AS BUILT LOCATION



INSTALLED	CASING	HOUSELINE	LOST
28'	25'	—	2'

PIPE: ☒ PLASTIC ☐ COATED
SERVICE TESTED AT: ☒ 100Lbs. ☐ ____ Lbs.

ANODE: ☐ 1 Lb ☐ 3 Lbs ☐ 17 Lbs
EXCESS FLOW VALVE: Lyall ☐ 475 ☐ 925; UMAC ☒ 350 ☐ 700 ☐ 1800
☐ BONDED ☐ MAIN ☐ INSULATED ☐ CURB

☐ REPLACED ☐ RELINED
CURB COCK INSTALLED? ☒ NO ☐ YES FT. ☐ IN ☐ OUT

REPORTS/REMARKS: 28' of 1/2" Poly
J.T. Riser ONLY.

CREW LEADER: R. Boespflug
DATE COMPLETED: 11-15-05
PLATTED BY: DRP
DATE PLATTED: JAN 03 2006

REMOVED

RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE

PIPE INSPECTION

EXISTING PIPE SIZE: 2" LENGTH EXPOSED: 1' FT. COVER: 34" IN. TO TOP OF PIPE

☒ PIPE ☐ FITTING ☐ OTHER
☒ MAIN ☐ SERVICE ☐ METER SET ☐ STATION
☐ STEEL ☐ CAST IRON ☒ POLY ☐ OTHER
☐ ABOVE GROUND ☒ BELOW GROUND
SOIL TYPE: ☐ SAND ☒ CLAY ☐ SOLID ROCK ☐ LOAM ☐ LOOSE ROCK
COVER: ☐ SOD ☐ GRAVEL ☐ ASPHALT ☐ CONCRETE

CORROSION TYPE: ☒ NONE ☐ GENERAL ☐ PITTING ☐ EROSION(Poly)
EXTENT: ☐ SEVERE ☐ MODERATE
COATING CONDITION: ☒ GOOD ☐ FAIR ☐ POOR
COATING TYPE: ☐ BARE ☐ BLUE ☐ TAPE WRAP ☐ BLACK (TAR) ☐ GREEN ☐ YELLOW (PE) ☒ OTHER: poly
PRESSURE CLASS: ☐ A Low pressure ☒ B 1 to 60 psi ☐ C 61 to 175 psi ☐ D 176 to 400 psi ☐ E 401 to 720 psi ☐ F over 720 psi
SURFACE: ☐ INTERIOR ☐ EXTERIOR (of pipe)
PIT SIZE: DEPTH (Max.) ____ DIAMETER (Max.) ____

COMMENTS:

CORROSION TEST SITE

TEST LEADS: ☐ LINE ☐ LINE CROSSING ☐ CALIBRATION ☐ INSULATOR ☐ CASING ☐ ANODE ☐ CPTL ☐ OTHER: ____ RECTIFIER ☐ YES ☐ NO

OTHER: ☐ METER SET ☐ CURB TILE ☐ VALVE ☐ TEST RISER ☐ REGULATOR ☐ VAULT ☐ CAGE
☐ CONDUIT ☐ LOCATE WIRE ☐ SQUARE BOX ☐ ROUND FRAME

LOCATION OF ANODE OR TEST LEADS.
____ FT ____ OF ____ P.L. OR C.L. OF ____
____ FT ____ OF ____ P.L. OR C.L. OF ____

Printed by SAS 11/11/2005 15:06:5

Enclosure 16

PLAT 4-011-025 (011-25)

DCS# 03 111672

EJL # -

F-8115 (Rev. 01/2001)

5404439 12-6

☐ MAIN [X] SERVICE

WORK ORDER

LOCATION

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE
034	3207A	03111672	1/2	12/01/05

COUNTY: Clark
PREMISE NUMBER: 26455685

CITY: Ridgefield
ADDRESS: 3211 S 2ND Way

DATE APPLIED: 12/01/05
DATE WANTED: 12/12/05

BETWEEN: L6 CEDAR RIDGE
AND: S 34TH AVE

PHONE:

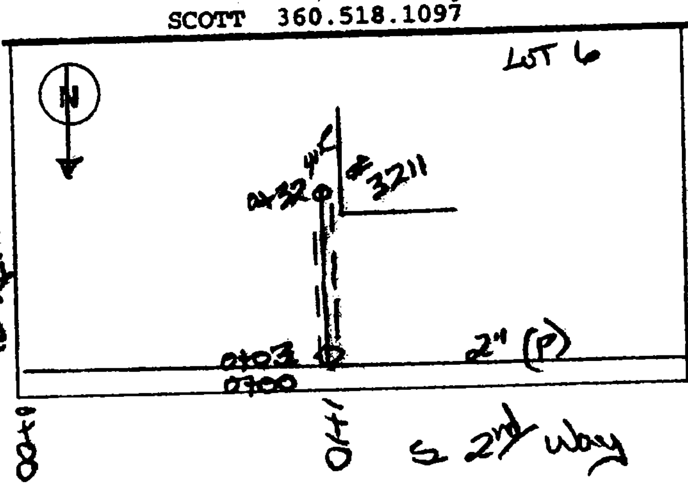
NAME: SUN COUNTRY HOMES
CONTACT NAME:

MAIN SIZE 2 TYPE P CLASS B
MAIN IS ON
FT. LINE OF
CURB COCK FT. ☐ INSIDE ☐ OUTSIDE

SERVICE SIZE FT. OF

INSTRUCTIONS: OP/GAR SD/MARKED P NO mark
OPEN 12/8 DD 12/9
SCOTT 360.518.1097

AS BUILT



MAIN

INSTALLED	CASING	HOUSELINE	LOST
33'	29'	—	6'

PIPE: [X] PLASTIC ☐ COATED
SERVICE TESTED AT: [X] 100Lbs. ☐ ____ Lbs.

ANODE: ☐ 1 Lb ☐ 3 Lbs ☐ 17 Lbs

EXCESS FLOW VALVE: Lyall [X] 478 ☐ 926; UMAC ☐ 350 ☐ 700 ☐ 1800

☐ BONDED ☐ MAIN ☐ INSULATED ☐ CURB

☐ REPLACED ☐ RELINED

CURB COCK INSTALLED? [X] NO ☐ YES FT. ☐ IN ☐ OUT

REPORTS/REMARKS: Installed 33' 1/2" PE w/ 29' casing
Riser Only J.T.

CREW LEADER: M. Redding
DATE COMPLETED: 12-9-05

PLATTED BY: DRP
DATE PLATTED: JAN 03 2006

RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE

PIPE INSPECTION

EXISTING PIPE SIZE 2 LENGTH EXPOSED 2 FT. COVER 36 IN. TO TOP OF PIPE

[X] PIPE ☐ FITTING ☐ OTHER

[X] MAIN ☐ SERVICE ☐ METER SET ☐ STATION

☐ STEEL ☐ CAST IRON [X] POLY ☐ OTHER

☐ ABOVE GROUND [X] BELOW GROUND

SOIL TYPE: ☐ SAND ☐ CLAY ☐ SOLID ROCK [X] LOAM ☐ LOOSE ROCK

COVER: [X] SOD ☐ GRAVEL ☐ ASPHALT ☐ CONCRETE

CORROSION TYPE: [X] NONE ☐ GENERAL ☐ PITTING ☐ EROSION(Poly)

EXTENT: ☐ SEVERE ☐ MODERATE

COATING CONDITION: [X] GOOD ☐ FAIR ☐ POOR

COATING TYPE: ☐ BARE ☐ BLACK (TAR) ☐ OTHER: Poly ☐ BLUE ☐ GREEN ☐ TAPE WRAP ☐ YELLOW (PE)

PRESSURE CLASS: ☐ A Low pressure [X] B 1 to 60 psi ☐ C 61 to 175 psi ☐ D 176 to 400 psi ☐ E 401 to 720 psi ☐ F over 720 psi

SURFACE: ☐ INTERIOR ☐ EXTERIOR (of pipe)

PIT SIZE
DEPTH (Max.) ____
DIAMETER (Max.) ____

COMMENTS:

CORROSION TEST SITE

TEST LEADS: ☐ LINE ☐ LINE CROSSING ☐ CALIBRATION ☐ INSULATOR ☐ CASING ☐ ANODE ☐ CPTL ☐ OTHER ____

RECTIFIER ☐ YES ☐ NO

OTHER: ☐ METER SET ☐ CURB TILE ☐ VALVE ☐ TEST RISER ☐ REGULATOR ☐ VAULT ☐ CAGE
☐ CONDUIT ☐ LOCATE WIRE ☐ SQUARE BOX ☐ ROUND FRAME

LOCATION OF ANODE OR TEST LEADS:

____ FT. ____ OF ____ P.L. OR C.L. OF ____

____ FT ____ OF ____ P.L. OR C.L. OF ____

Printed by MAH 12/1/2005 14:47:

Enclosure 17

F-8115
(Rev. 03/2006)

☐ MAIN ☒ SERVICE

Flaggers

WORK ORDER

PLAT 1-022-053(22-53)

DCS# 03 123799

EJL # -

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE
034	3217A	03123799	1/2	04/17/06

LOCATION

611923 4-20

CITY	ADDRESS	COUNTY	PREMISE NUMBER
Camas	665 NW NORWOOD St	Clark	26040988
BETWEEN	AND	DATE APPLIED	DATE WANTED
	7TH AVE	04/13/06	05/04/06

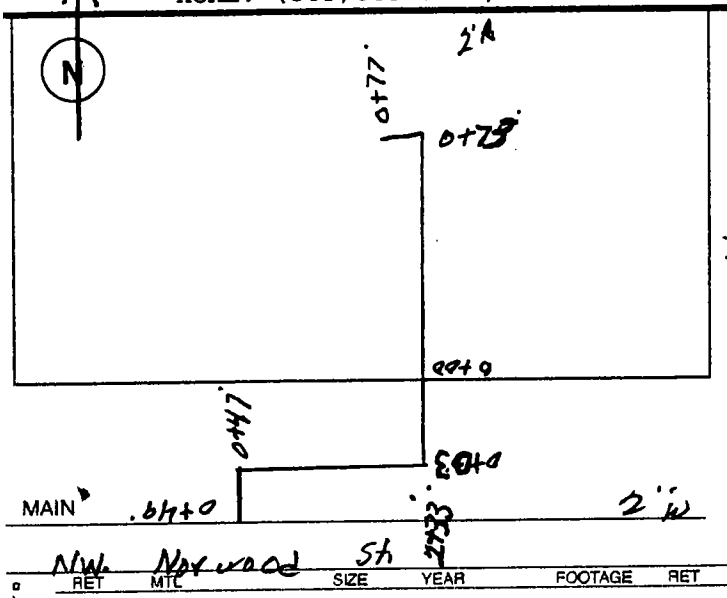
NAME: SCHRAM, BRAD K — CONTACT NAME — PHONE

MAIN SIZE 2 TYPE P CLASS B — MAIN IS ON — FT LINE OF

SERVICE SIZE — FT. OF — CURB VALVE FT. ☐ INSIDE ☐ OUTSIDE

INSTRUCTIONS: CALL B4 TO MEET
as per sketch
HOME: (503)665-0160, BUS: Camas OK

AS BUILT



INSTALLED	CASING	HOUSELINE	LOST
128' 1/2 PE	—	—	—

PIPE: ☒ PLASTIC ☐ COATED — SERVICE TESTED AT: ☒ 100 Lbs. ☐ ____ Lbs.

ANODE: ☐ 1 Lb ☐ 3 Lbs ☐ 17 Lbs

EXCESS FLOW VALVE: Lyall ☐ 475 ☐ 925 — UMAC ☐ 350 ☐ 700 ☐ 1800

☐ BONDED ☐ MAIN ☐ INSULATED ☐ CURB

☐ REPLACED ☐ RELINED

CURB VALVE INSTALLED? ☒ NO ☐ YES ____ FT. ☐ IN ☐ OUT

REPORTS/REMARKS: Installed New Service from main to riser Set meter # 929684 CV off tagged

CREW LEADER: Streeter — DATE COMPLETED: 4-26-06

PLATTED BY — DATE PLATTED

DISPOSAL	RET	MTL	SIZE	YEAR	FOOTAGE	RET	MTL	SIZE	YEAR	FOOTAGE	CODE

PIPE INSPECTION

EXISTING PIPE SIZE 2" — LENGTH EXPOSED 4 FT. — COVER 30 IN. TO TOP OF PIPE

☒ PIPE ☐ FITTING ☐ OTHER ____

☒ MAIN ☐ SERVICE ☐ METER SET ☐ STATION

☒ STEEL ☐ CAST IRON ☐ POLY ☐ OTHER

☐ ABOVE GROUND ☒ BELOW GROUND

SOIL TYPE: ☐ SAND ☐ CLAY ☐ SOLID ROCK ☐ LOAM ☒ LOOSE ROCK

COVER: ☐ SOD ☒ GRAVEL ☐ ASPHALT ☐ CONCRETE

CORROSION TYPE: ☒ NONE ☐ GENERAL ☐ PITTING ☐ EROSION(Poly)

EXTENT: ☐ SEVERE ☐ MODERATE

COATING CONDITION: ☒ GOOD ☐ FAIR ☐ POOR

COATING TYPE: ☐ BARE ☐ BLUE ☐ TAPE WRAP ☒ BLACK (TAR) ☐ GREEN ☐ YELLOW (PE) ☐ OTHER: ____

PRESSURE CLASS: ☐ A Low pressure ☒ B 1 to 60 psi ☐ C 61 to 175 psi ☐ D 176 to 400 psi ☐ E 401 to 720 psi ☐ F over 720 psi

SURFACE: ☐ INTERIOR ☐ EXTERIOR (of pipe)

PIT SIZE — DEPTH (Max.) ____ — DIAMETER (Max.) ____

P/S Meas. -1.24 V — Name / Date DD 4-26-06 — Model / Ser. # FL 90200 25

COMMENTS:

CORROSION TEST SITE

TEST LEADS: ☐ LINE ☐ LINE CROSSING ☐ CALIBRATION ☐ INSULATOR ☐ CASING ☐ ANODE ☐ CPTL ☐ OTHER: ____ — RECTIFIER ☐ YES ☐ NO

OTHER: ☐ METER SET ☐ CURB TILE ☐ VALVE ☐ TEST RISER ☐ REGULATOR ☐ VAULT ☐ CAGE ☐ CONDUIT ☐ LOCATE WIRE ☐ SQUARE BOX ☐ ROUND FRAME

LOCATION OF ANODE OR TEST LEADS.

____ FT. ____ OF ____ P.L. OR C.L. OF ____

____ FT. ____ OF ____ P.L. OR C.L. OF ____

Enclosure 18

PLAT 4-011-025(011-25)

DCS# 03 064757

EJL# 205690-01

[X] MAIN [ ] SERVICE

WORK ORDER

(Rev 1/2001)

5177711 & 5177721 5218453 5218460 010 7-12 7-1 LOCATION

CLASS	ACCOUNT	W.O. SUB.	CODE/SIZE	DATE
034	1213A	03064757	2	05/16/05

CITY: Ridgefield

ADDRESS: NE PIONEER ST & S 32ND PL

COUNTY: Clark

PREMISE NUMBER:

BETWEEN: Cedar Ridge Dr AND

DATE APPLIED: 09/13/04

DATE WANTED: 12/25/05

NAME: CEDAR RIDGE PUD

CONTACT NAME:

PHONE:

MAIN SIZE TYPE CLASS

MAIN IS ON FT. LINE OF

SERVICE SIZE FT. OF

CURB COCK FT. [ ] INSIDE [ ] OUTSIDE

INSTRUCTIONS Install 10594' of 2" (P) main. 6675'

HOME: --, BUS:

DEC 22 2005

CCJ

Ridgefield

(N)

"See SKetCH"

MAIN

INSTALLED	CASING	HOUSELINE	LOS
6675	538' 4" PVC		

PIPE: [X] PLASTIC [ ] COATED

SERVICE TESTED AT: [X] 100Lbs. [ ] ___ Lbs.

ANODE: [ ] 1 Lb [ ] 3 Lbs [ ] 17 Lbs

EXCESS FLOW VALVE: Lyall [ ] 475 [ ] 925; UMAC [ ] 350 [ ] 700 [ ] 1800

[ ] BONDED [ ] MAIN [ ] INSULATED [ ] CURB

[ ] REPLACED [ ] RELINED

CURB COCK INSTALLED? [ ] NO [ ] YES ___ FT [ ] IN [ ] OUT

REPORTS/REMARKS.

CREW LEADER: R. Bonner

DATE COMPLETED: 7-19-05

PLATTED BY: DRP

DATE PLATTED: JAN 03 2006

DISPOSAL: RET MTL SIZE YEAR FOOTAGE RET MTL SIZE YEAR FOOTAGE CODE

Installed In Available utility Trench - not complete

As-Built Received In Eng. Dept.

AS BUILT

PIPE INSPECTION

EXISTING PIPE SIZE 2"W LENGTH EXPOSED 4 FT. COVER 36 IN. TO TOP OF PIPE

[X] PIPE [ ] FITTING [ ] OTHER

[X] MAIN [ ] SERVICE [ ] METER SET [ ] STATION

[X] STEEL [ ] CAST IRON [ ] POLY [ ] OTHER

[ ] ABOVE GROUND [X] BELOW GROUND

SOIL TYPE: [ ] SAND [X] CLAY [ ] SOLID ROCK [ ] LOAM [ ] LOOSE ROCK

COVER: [ ] SOD [ ] GRAVEL [X] ASPHALT [ ] CONCRETE

CORROSION TYPE: [ ] NONE [ ] GENERAL [ ] PITTING [ ] EROSION(Poly)

SURFACE: [ ] INTERIOR [ ] EXTERIOR (of pipe)

EXTENT: [ ] SEVERE [ ] MODERATE

COATING CONDITION: [X] GOOD [ ] FAIR [ ] POOR

COATING TYPE: [ ] BARE [ ] BLACK (TAR) [ ] OTHER: ___ [ ] BLUE [X] GREEN [ ] TAPE WRAP [ ] YELLOW (PE)

PIT SIZE: DEPTH (Max.) ___ DIAMETER (Max.) ___

PRESSURE CLASS: [ ] A Low pressure [X] B 1 to 60 psi [ ] C 61 to 175 psi [ ] D 176 to 400 psi [ ] E 401 to 720 psi [ ] F over 720 psi

COMMENTS:

CORROSION TEST SITE

TEST LEADS: [ ] LINE [ ] LINE CROSSING [ ] CALIBRATION [ ] INSULATOR [ ] CASING [ ] ANODE [ ] CPTL [ ] OTHER ___

RECTIFIER [ ] YES [ ] NO

OTHER: [ ] METER SET [ ] CURB TILE [ ] VALVE [ ] TEST RISER [ ] REGULATOR [ ] VAULT [ ] CAGE

[ ] CONDUIT [ ] LOCATE WIRE [ ] SQUARE BOX [ ] ROUND FRAME

LOCATION OF ANODE OR TEST LEADS:

___ FT ___ OF ___ P.L. OR C.L. OF ___

___ FT ___ OF ___ P.L. OR C.L. OF ___

Enclosure 19

Oct 13 2005 6:55AM Loy Clark Pipeline 5035208763 p.3

OCT. 12. 2005 7:06AM NW NATURAL 503 721 2552

PLAT NO. 494-02 P. 2 1-25

[X] MAIN [ ] SERVICE

WORK ORDER

DOC# 03 064757

E.L.# 205690-01

CLASS	ACCOUNT	W.O. SUB	CODE/SIZE	DATE	COUNTY	PREMISE NUMBER
034	1213A	03064757	2	05/16/05	Clark	

CITY: Ridgefield
ADDRESS: NE PIONEER ST & S 32ND PL
AND
DATE APPLIED: 09/13/04
DATE WANTED: 12/15/05
BETWEEN: Cedar Ridge Dr
CONTACT NAME
PHONE
NAME: CEDAR RIDGE PUD
FT. LINE OF
MAIN SIZE TYPE CLASS MAIN IS ON
CURB COCK FT. [ ] INSIDE [ ] OUTSIDE
SERVICE SIZE FT OF
INSTRUCTIONS: Install ~~10576~~ 4168 of 2" (P) main.
HOME: --, BUS:

Ridgefield

517711 & 517772
5218453 ~~5218468~~
7-D LOCATION

NOV 22 2005

CC

INSTALLED: 1275 CASING: 538 4" HOUSELINE: PVC LOSS

PIPE: PLASTIC [ ] COATED
SERVICE TESTED AT 100 Lbs.

ANODE: [ ] 1 Lb [ ] 3 Lbs [ ] 17 Lbs
EXCESS FLOW VALVE: Lyall [ ] 475 [ ] 925; UMAC [ ] 389 [ ] 700 [ ] 1000
[ ] BONDED [ ] MAIN [ ] INSULATED [ ] CURB
[ ] REPLACED [ ] RETIRED
CURB COCK INSTALLED? [ ] NO [ ] YES ___ FT. [ ] IN [ ] OUT

REPORTS/REMARKS.

(N) "See Sketch"

MAIN

CREW LEADER: Ron Pic
DATE COMPLETED: 10/20/05 7-19-05
PLOTTED: R. Bonneau
DRP
DATE POSTED: JAN 03 2006

As-Built Received in Eng. Dept.

AS BUILT

MAIN
INST	NO.	SIZE	YEAR	FOOTAGE	SIZE	NO.	SIZE	YEAR	FOOTAGE	CODE

Installed In Available Utility Trench - Not Complete

EXISTING PIPE SIZE 2" w 2 P LENGTH EXPOSED 4' FT. COVER 36 IN. TO TOP OF PIPE

PIPE INSPECTION

[ ] PIPE [ ] FITTING [ ] OTHER
[X] MAIN [ ] SERVICE [ ] METER SET [ ] STATION
[ ] STEEL [ ] CAST IRON [ ] POLY [ ] OTHER
[ ] ABOVE GROUND [X] BELOW GROUND
SOIL TYPE: [ ] SAND [X] CLAY [ ] SOLID ROCK [ ] LOAM [ ] LOOSE ROCK
COVER: [ ] SOD [ ] GRAVEL [X] ASPHALT [ ] CONCRETE

CORROSION TYPE: [ ] NONE [ ] GENERAL [ ] PITTING [ ] EROSION(Poly)
EXTENT: [ ] SEVERE [ ] MODERATE
COATING CONDITION: [X] GOOD [ ] FAIR [ ] POOR
COATING TYPE: [ ] BARE [ ] BLACK (TAR) [ ] OTHER [ ] BLUE [X] GREEN [ ] TAPE WRAP [ ] YELLOW (PE)
PRESSURE CLASS: [ ] A Low pressure [X] B 1 to 60 psi [ ] C 61 to 175 psi [ ] D 176 to 400 psi [ ] E 401 to 750 psi [ ] F over 750 psi
SURFACE: [ ] INTERIOR [ ] EXTERIOR (of pipe)
PIT SIZE
DEPTH (Max.)
DIAMETER (Max.)

COMMENTS:

CORROSION TEST SITE

TEST LEADS: [ ] LINE [ ] LINE CROSSING [ ] CALIBRATION [ ] INSULATOR [ ] CASING [ ] ANODE [ ] CPTL [ ] OTHER
RECTIFIER [ ] YES [ ] NO

OTHER: [ ] METER SET [ ] CURB TILE [ ] VALVE [ ] TEST RISER [ ] REGULATOR [ ] VAULT [ ] CASE
[ ] CONDUIT [ ] LOCATE WIRE [ ] SQUARE BOX [ ] ROUND FRAME

LOCATION OF ANODE OR TEST LEADS:

____ FT. ____ OF ____ P.L. OR C.L. OF ____

____ FT ____ OF ____ P.L. OR C.L. OF ____

Printed by (XCJ 8/1/2006 15:23)

Damage Check List

- ❑ For reportable incidents – contact Gas Control at x4613.

MAINS

- ❑ Pretest pipe prior to installation for poly. (On B pressure damages steel is sometimes air tested on site prior to installation). Note on Work Order: Air tested at pressure (#) and duration. Example: "***Air tested at 100# for 40 minutes***".

- ❑ If you have pretested pipe (steel), note test number on work order. A pre-test pipe usage report (Form 8162NS) must be filled out anytime pretest steel pipe is installed regardless of pressure.

- ❑ Soap test at line pressure for final connection point and fittings. Note on Work Order: "***Soap tested connection at line pressure.***"

- ❑ Leakage survey to be performed in area where damage occurred after repair is complete. All adjacent areas should be fully surveyed to assure no secondary leakage exists. Note on Work Order: Leakage Survey performed and describe area surveyed, example: ***"Leakage Survey performed from Sta. 0+00 to 0+59"***. Note findings on Work Order: example "***No leakage found.***" Note on Work Order: instrument ID number, example "***Trak-It 2242***". If leakage is found notify the Field Supervisor.

SERVICES

- ❑ Air Test from point of damage to riser. Note on Work Order: Air tested at pressure (#) and duration. Example: "***Air tested from point of damage to riser at 100# for 10 minutes***".

- ❑ Soap test at line pressure for final connection point and fittings. Note on Work Order: "***Soap tested connection at line pressure.***"

- ❑ Leakage survey to be performed from damage point to main. As required, survey all adjacent areas to assure no secondary leakage exists. Note on Work Order: "***Leakage Survey performed from damage point to main***". Note findings on Work Order: example "***No leakage found***". Note on Work Order: instrument ID number, example "***Trak-It 2242***". If leakage is found notify the Field Supervisor.

MAINS OR SERVICES (In Washington ONLY)

- ❑ If coating is removed on steel services or main to repair due to damage, then Pipe to Soil reading must be taken and recorded on the Work Order.
- ❑ If on an after hours damage, notify the local Field Supervisor, so that a Pipe to Soil reading can be taken later.

GENERAL NOTES

1. Call the following Utilities Notification Center 48 hours prior to any excavation:
   Oregon: 1-800-332-2344
   Washington: 1-800-424-5555
2. Fill out construction sketch as-built supplied with job packet and return with work order. Only one as-built is required.
3. All distribution mains must have a minimum depth of 24" and services must have a minimum depth of 12" in private property and 18" in public right-of-ways, unless there is an approved variance.
4. All transmission lines must have a minimum depth of 30" in Class '1' locations and 36" in Class '2, 3, & 4' locations, unless there is an approved variance.
5. Written dimensions on this construction sketch have precedence over scaled dimensions.
6. Pressure test shall be tested in accordance with standards in CFM and Engineering Standard Practice.
7. Test medium for class "B" main shall be air, unless otherwise noted. Test medium for class "C-F" main shall be water, unless otherwise noted.
8. For Class C or higher tests, see Design Document and Hydrostatic Report.

ON (circle & label test area on as-built drawing)

OFF		Pass Y/N	Print Name and Initial
	Time		

S

CERT. MAOP	OPER. MAOP	NOP	MAIN CHARGE#	WMIS WORK ORDER #

ngineering Department

	DRAWN	DATE	APPROVED	DATE

STATE

SCALE: 1" = 100'

DESIGNED		DATE	
DRAWN		DATE	
APPROVED		DATE	
CREW LDR.		DATE	
PLATTED		DATE	

JOB TYPE:
WMIS #: PROJECT #:

Date: 11/1/2006 7:31:22 AM User: DEB File: deleteMe.mxd

NW Natural

STANDARD PRACTICE – Washington
SPW 253

Title: Polyethylene Pipe Installations

Revision: 12 (supersedes Rev. 11, 6/8/06) Approved: July 13, 2006
Signatures on file.

Reviewed: Reviewed:

1. SCOPE

This standard practice sets forth the policy for the installation of polyethylene pipe and fittings in the company distribution system.

2. POLICY

Pipe sizes, pipe thickness, fittings, and appurtenances must be designed and installed to meet company criteria in accordance with engineering principles. Fusion and mechanical joints in polyethylene pipelines must be assembled using company-approved materials and joining procedures by qualified company personnel or qualified non-company personnel. Persons inspecting plastic joints must be qualified by appropriate training or experience.

Fusion procedures must be consistent with the manufacturer's recommended procedures and 49 CFR, Part 192.

3. POLICY DETAIL

3.1 Materials

- All new polyethylene (PE) gas pipe must be PE 2406. Both the PE pipe and fittings must meet ASTM D 2513 standards. Fitting and joining procedures must be compatible with the piping material.
- Standard Dimension Ratio (SDR) for PE pipe must be as specified in table 1.

Table 1. SDR requirements for PE pipe.

Classification	Nominal Pipe Size (in)	Standard Dimension Ratio
CTS	½	7
	1	11.5
	1¼	10
IPS	2	11
	3	11.5
	4	11.5
	6	11.5

- Each imperfection or damage that would impair the serviceability of PE pipe must be repaired or removed.

3.2 Installation Practices

3.2.1 General Requirements

- Maximum operating pressure for PE pipe may not exceed 60 psig without the approval of the Chief Engineer.
- A fused joint in PE pipe may not be disturbed until it has properly set.
- PE pipe may not be joined by a threaded joint or miter joint.

- Liquid odorant must not be introduced directly into PE pipelines.
- PE pipe must be installed so as to minimize shear or tensile stresses.
- Each valve installation in PE pipe must be designed so as to protect the plastic material against
  - Excessive torsional or shearing loads when the valve or shutoff is operated, and
  - Any other secondary stresses that might be exerted through the valve or its enclosure.
- Anode-less service risers must be installed on PE services in the usual case, but field-bent risers with exterior sunshields are acceptable. Field bends must be made with an approved bending shoe only.
- Curb valves for PE services, where required, must be PE valves or, alternatively, metal valves with cathodic protection.
- Where feasible, install and backfill PE pipe prior to pressure testing to identify any damage that may have occurred during the installation and backfill process.
- The adhesive on any tape applied to the PE carrier pipe must not damage the pipe material.

3.2.2 Uncased PE Pipe

PE pipe that is not encased must have:

- A minimum wall thickness of 0.090 inch.

  Exception: Pipe with an OD of 0.875 inch or less may have a minimum wall thickness of 0.062 inch.
- A tracer wire (see section 3.4).
- Minimum radius of bend for uncased PE pipe must not be less than shown in table 2.

Table 2. Minimum cold bending radius for OD-controlled pipe (long-term).

Pipe Dimension Ratio (DR)	Minimum Cold Bending Radius
≥ 9	20 times pipe OD
> 9 – 13.5	25 times pipe OD
> 13.5 – 21	27 times pipe OD
> 21	30 times pipe OD
Fitting or flange present in bend	100 times pipe OD

3.2.3 Insertion of PE Pipe into an Existing Metal or Plastic Conduit

- For underground installations and installations not exposed to direct sunlight, casings need only be large enough to permit the insertion of PE without damage.
- Spacers are not required between the carrier pipe and the conduit. End spacers will be installed as necessary to prevent damage from conduit ends.
- For mains installed in conduits, both ends must be sealed. Services installed in casings must have casings sealed at the riser end.

- PE pipe that is pulled through the ground by mechanical means must have a weak link installed to ensure the pipe is not damaged by excessive tensile forces.
- During insertion the leading edge of the pipe must be sealed or capped. The pipe must be inspected for damage at all available openings during and at completion of the insertion.
- Insertion can be accomplished by push, pull, or both. The pull force on PE pipe must not exceed the values listed in table 3.

Table 3. Maximum allowable pull force on PE pipe.

Classification	Nominal Pipe Size (in)	Standard Dimension Ratio	Maximum Pull Force (lb)
CTS	½	7	294
	1	11.5	355
	1¼	10	875
IPS	2	11	1645
	4	11.5	5674
	6	11.5	12298

Testing for both PE mains and services must be in accordance with the testing parameters listed in SPW 511, Testing New Class B Pipelines.

3.2.4 Open-trench Installation

- The trench bottom must be shaped to provide continuous pipe support.
- When installing plastic pipelines parallel to other underground utilities, the company must ensure there is a minimum of 12 inches of separation from the other utilities. Where a minimum 12 inches of separation is not possible, adequate precautions must be taken, such as inserting the plastic pipeline in conduit, to minimize any potential hazards resulting from the close proximity to the other utilities.
- When installing plastic pipelines perpendicular to other underground utilities, the company must ensure there is a minimum of 6 inches of separation from the other utilities. Where a minimum 6 inches of separation is not possible, adequate precautions must be taken to minimize any potential hazards resulting from the close proximity to the other utilities.
- Sand padding must be placed around the pipe if excavated material is not suitable for direct contact with the pipe. Any excavated material can be used as backfill 6 inches or more away from the pipe.
- For pipe installed in plastic conduit, the backfill should be placed in a manner that will not damage the integrity of the conduit.
- Methods and materials used for soil compaction must not be injurious to the pipe. Well-compacted support (including lateral support) is required for valves and valve boxes.

Important: Pressurized PE pipe must be shaded with at least 6 inches of sand (or equivalent backfill material) or covered with plywood or a steel plate. This requirement applies even if the pipe is installed in a casing or conduit. Exceptions for emergency conditions must be approved by the Chief Engineer or a designee.

3.2.5 Squeeze Restrictions

- PE pipe may not be squeezed more than one time in the same location.
- PE pipe must not be squeezed within 12 inches or 3 pipe diameters, whichever is greater, from any joint or fitting.

3.3 Tracer Wire

- An approved tracer wire must be placed in close proximity to the pipe and should be accessible at intervals of approximately 500 feet. Cathodic protection for the wire will consist of 1-pound anodes with a maximum spacing of 1000 feet.
- Uncased and nonmetallic cased PE pipe must have a tracer wire as a means of locating the pipe underground. Tracer wire may not be wrapped around the pipe in a spiral.

3.4 Prohibited Locations

PE pipe must not be installed in any of the following locations:

- Inside or under a building.
- In any location where operating temperatures of the pipe are outside the range of –20 to +140°F.
- In permanent aboveground locations, except inside a standard riser or casing with protection from high temperatures by casing spacers or an exterior sunshield surrounding the casing.
- On bridge crossings.
- In underground or aboveground vaults.
- Within 12 inches of a known secondary underground power line, unless proximity is unavoidable and mitigated in the design.
- Within 3 feet of a known water line, unless proximity is unavoidable and mitigated in the design.
- Through a curb valve (unless the core has been removed), or through any fitting or device that has the capability of damaging the pipe.
- Through any soil that is known to be, or suspected of being, contaminated by petroleum products.

3.5 Aboveground Temporary Installation

Uncased PE pipe may be temporarily installed aboveground for a maximum of 30 days with the approval of the Chief Engineer. During that time, it must be monitored and protected from potential damage.

Uncased PE pipe may be installed aboveground longer than 30 days if a written monitoring program is followed and the WUTC is notified by telephone before exceeding the 30-day limit.

4. RELATED COMPANY INFORMATION

SPW 059 – Storage and Handling of Polyethylene Pipe and Fittings
SPW 251 – Fusion Testing
SPW 511 – Testing New Class B Pipelines
CFM 503-1 – Butt Fusion: No. 14 & No. 28 Fusion Machines
CFM 601-2 – Polyethylene Installation Standards

CFM 606-1 – Polyethylene Joining Procedures
CFM 615-9 – Tracer Wire

5. REFERENCE CODES AND STANDARDS

49 CFR 192.59 – Plastic pipe
49 CFR 192.121 – Design of plastic pipe
49 CFR 192.123 – Design limitations for plastic pipe
49 CFR 192.159 – Flexibility
49 CFR 192.193 – Valve installation in plastic pipe
49 CFR 192.273 – General
49 CFR 192.281 – Plastic pipe
49 CFR 192.283 – Plastic pipe: Qualifying joining procedures
49 CFR 192.285 – Plastic pipe: Qualifying persons to make joints
49 CFR 192.287 – Inspection of joints
49 CFR 192.311 – Repair of plastic pipe
49 CFR 192.321 – Installation of plastic pipe
49 CFR 192.375 – Service lines, plastic
49 CFR 192.455 – External corrosion control: Buried or submerged pipelines installed after July 31, 1971
49 CFR 192.513 – Test requirements for plastic pipelines
ASTM Std D 2513 – Specifications for Thermoplastic Gas Pressure Piping, Tubing, and Fittings
WAC 480-93-115 – Casing of pipelines
WAC 480-93-178 – Protection of plastic pipe

DEPARTMENTAL AND DISTRICT RESPONSIBILITIES

Department	Responsibilities
Engineering	• Select PE materials for general company use. • Specify material (PE or steel) for mains and in critical applications for services. • Keep records of company tests and manufacturers' test and certification data. • Maintain and update joining procedures in cooperation with Construction Services. • Test and qualify company and contractor personnel in the assembly of fusion and mechanical joints as applicable (see SPW 251).
Construction Services	• Perform PE installations, as required. • Make field decisions regarding the use of PE pipe for new and replacement services, when not specified by Engineering, in a manner consistent with the provisions of this standard practice; and provide Engineering with as-built information on all installations. • Develop detailed procedures for field use in keeping with this standard practice. • Maintain and update joining procedures in cooperation with Engineering.