Exhibit VGS-AG-075

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Notice of Probable Violations by Vermont Gas	)	
Systems, Inc. for certain aspects of the	)	Case No. 18-0395-PET
construction of the Addison Natural Gas	)	
Project	)	

NOTICE OF APPEARANCE

Please enter the appearance of Debra L. Bouffard on behalf of Vermont Gas Systems, Inc. in the above-referenced matter.

Dated at Burlington, Vermont this 28th day of February 2018.

VERMONT GAS SYSTEMS, INC.

By: ____________________________
SHEEHEY FURLONG & BEHM P.C.
Debra L. Bouffard, Esq.
30 Main Street
P.O. Box 66
Burlington, VT 05402
(802) 864-9891
dbouffard@sheeheyvt.com

STATE OF VERMONT
PUBLIC UTILITY COMMISSION

Notice of Probable Violations by Vermont Gas Systems, Inc. for certain aspects of the construction of the Addison Natural Gas Project	))))	Case No. 18-0395-PET

RESPONSE OF VERMONT GAS SYSTEMS, INC. TO DPS FEBRUARY 16, 2018 NOPV

Pursuant to Public Utility Commission (the "Commission") Rule 6.104(D), Vermont Gas Systems, Inc. ("Vermont Gas" or "VGS") submits this Response to the amended Notice of Probable Violations regarding construction of the Addison Natural Gas Project ("ANGP" or the "Project") received from the Department of Public Service (the "Department") on February 16, 2018 (the "NOPV").

INTRODUCTION

As described below and in the attachments filed with this Response, VGS and the Department engaged in an open dialogue on many of the issues described in the NOPV at the time of construction and thereafter. This history reveals that Vermont Gas exercised informed judgment in the field and constructed the Project safely and appropriately; the matters covered by the NOPV boil down to differing interpretations regarding whether VGS' installation methods at the noted locations conformed with construction specifications.

While VGS disagrees with the Department's conclusion that VGS violated 49 CFR §192.303 in the locations specified by installing the pipeline in a manner the Department asserts is at odds with written specifications, VGS and the Department both agree that the incidents identified in the Department's NOPV constituted compliance issues and did not put public safety at risk. VGS also concurs with the Department that the remedial measures identified will provide additional protection and monitoring of the condition of the pipeline. VGS has recognized, over the course of many discussions with the Department about these issues, that the Department does not share its view of the proper interpretation in the field of the Project's written specifications. While VGS modified its specifications over time in an effort to meet the Department's concerns, ultimately the Department has not found VGS compliant in these locations. In order to bring closure to the Department's inspection related to these issues, VGS accepts the $25,000 penalty and remedial action recommended by the Department, and will submit a compliance plan, as set forth below.

DISCUSSION

I. VGS Response To DPS Findings

VGS submits and incorporates the attached VGS Review of the Department's NOPV ("VGS Review"), prepared by VGS engineering staff for its substantive response to the Department's Finding 1 regarding pipe bedding and support; Finding 2, regarding trench breakers; and the Department's stated concerns regarding pipe coating. The VGS Review cites and attaches documentation and correspondence relevant to each of the Department's conclusions. In addition, in order to obtain an independent review of this NOPV and the remedial action sought, VGS requested review by Mark Hereth, who has considerable expertise in pipeline installation regulatory compliance. Mr. Hereth's comments in response to the Department's findings and remedial measures are also attached to the VGS Review as Attachment 4, and incorporated herein.

As this material demonstrates, VGS has been in communications with the Department about many of these issues for months and in some instances even longer. VGS was responsive to Department concerns raised during construction regarding the level of detail of some of its specifications, modifying its written specifications at times during the Project to provide additional clarity to meet these concerns. But VGS does not share the Department's opinion that Project written specifications should have expressly covered every field condition encountered during construction. VGS believes that the pipeline was installed in accordance with specifications and PHMSA requirements at the locations specified. The written specifications did permit discretion where warranted, so long as the installation methods were also compliant with federal pipeline safety standards. While VGS does not share the Department's view that VGS failed to follow its own specifications in violation of 49 C.F.R. § 192.303, VGS nevertheless recognizes the Department's position and concurs that the remedial actions sought by the Department provide additional protection and monitoring of the pipeline condition to ameliorate the concerns raised by the NOPV.

II. VGS Response To The Relief Sought By Department

The Department seeks both remedial action and a civil penalty. VGS accepts the remedial action and proposed fine, and will submit a plan for compliance as set forth in Commission Rule 6.104(E)(1) after conferring with the Department. Some of the timelines, definitions, and criteria in the Department's remedial action require further specificity and adjustments to ensure Vermont Gas can implement these measures, and Vermont Gas will include those in the filed plan.

The Department cites Commission Rule 6.104(I) and the eight factors listed in 30 V.S.A. §30(c) in seeking a $25,000 civil penalty. In particular, the Department relies upon factors five (deterrent effect) and seven (record of compliance), which mirror Rule 6.104(I)'s "history of prior violations . . . and likely effect of the penalty."

The Department has acknowledged that the incidents that are the subject of this NOPV did not implicate public safety and has also stated that the remedial measures sought will address any potential increased risk of corrosion that may be presented. It is also clear from the Department's filing and the VGS Review, that the Department and VGS had an ongoing dialogue about many of these issues at the time of construction and over the several months since. VGS acknowledges that on a number of occasions during the construction of the Project, it had different views than Department engineering staff about the application of particular specifications. This is not a situation where a company failed to oversee its contractors or to respond to its regulators. To the contrary, it is clear that these alleged violations are based upon differences of opinion, discussed with the Department over time, regarding how specifications were to be applied.

VGS worked closely throughout the Project with Department staff and its hired inspector, maintaining an open dialogue about issues and modifying specifications to attempt to satisfy Department requests. These differences arose in good faith; were reviewed with the Department's staff and through VGS' communications with its contractors and QA/QC personnel; and show VGS's attempts to be transparent and achieve compliance. VGS has continued to act in good faith in working with the Department on these issues, and looks forward to doing so in the future.

Nevertheless, pursuant to PUC Rule 6.104(E)(2), VGS agrees to pay the recommended $25,000 fine to bring closure to the extensive dialogue with the Department on these issues. It acknowledges the Department's position as articulated in the NOPV. VGS has in place a robust monitoring and inspection program that will be further enhanced by the Department's remedial measures. VGS is committed to moving past these disputes and directing necessary resources going forward toward fulfilling that program.

CONCLUSION

Given its agreement to the relief requested by the Department, VGS is not requesting a hearing on this NOPV. See PUC Rule 6.104(E)(1)&(2), and 6.104(G). As soon as it is able to share with the Department, VGS will file the compliance plan described above, along with a Proposed Order incorporating the conditions set forth above and in the filed plan, and ordering VGS to pay the requested $25,000 penalty.

Dated at Burlington, Vermont this 28th day of February, 2018.

VERMONT GAS SYSTEMS, INC.

By: ______________________________
SHEEHEY FURLONG & BEHM P.C.
Debra L. Bouffard Esq.
30 Main Street
P.O. Box 66
Burlington, VT 05402
(802) 864-9891
dbouffard@sheeheyvt.com

VGS Review of the Department's February 16, 2018 NOPV

Dated: February 27, 2018
Prepared By: Christopher LeForce (Project Engineering Manager)
and Adam Gero (Engineering and Compliance Manager)

DPS Finding Number 1: Pipe Support

DPS Finding:

"The design drawings (details 3 and 6 on Sheet ANGP-T-G-015) clearly specify that a minimum of six inches of select backfill be placed underneath the pipe for support in the absence of sandbags or pipe pillows. On August 31, 2015, VGS installed pipe directly on the bottom of the trench between stations 240+26 and 279+75 (3,949 feet)." "[I]n 2016, VGS installed pipe directly on the bottom of the trench between stations 564+24 and 567+84 (360 feet)." "In addition to the above, VGS also installed pipe without support in at least two locations."

"The Department believes that installing the pipe directly on the bottom of the trench was not in accordance with VGS's written specifications, and is therefore a violation of 49 C.F.R. §192.303. In addition, the Department is concerned that this installation may have an increased susceptibility to corrosion due to differing soil conditions above and below the pipe, and unknown materials in the soil below the pipe."

Code Section(s) Cited by DPS:

49 CFR §192.303 Compliance with specifications or standards.
Each transmission line or main must be constructed in accordance with comprehensive written specifications or standards that are consistent with this part.

49 CFR §192.319 Installation of pipe in a ditch
(b) When a ditch for a transmission line or main is backfilled, it must be backfilled in a manner that:
  (1) Provides firm support under the pipe; and
  (2) Prevents damage to the pipe and pipe coating from equipment or from the backfill material.

CPG, Plans, & Specifications relevant to DPS NOPV:

CPG Final Order Paragraph 2 in Docket 7970 states: "Construction of the proposed Project shall be in accordance with plans and evidence as submitted in this proceeding. Any material deviation from these plans or a substantial change to the Project must be approved by the Board."

VGS maintained written specifications for the project, including a specification for pipe support, VGS Specification Section 312333 (which was modified at times during the ANGP), is discussed below.

VGS project alignment plans, Detail 3 and 6, discussed below, depict "typical" detail for pipe support in the project.

VGS Response to DPS station-specific allegations:

For the reasons described below, VGS believes the pipe was properly supported and protected throughout the project installation.

VGS maintained comprehensive written specifications throughout the project, as required by 49 CFR §192.303, modified from time to time as described below.

At stations 240+26 to 279+75, pipe was installed directly on the trench bottom on August 31, 2015. Specification 312333, dated April 29, 2015 (provided here as **Attachment 1**), was in place at the time of installation, and it stated the following:

> *"Pipe supports shall be installed in all locations prior to backfilling, unless otherwise directed by the Construction Management Team – refer project design drawings for further requirements. Stacked sandbags, pipe pillows, or owner approved equal are acceptable methods. Spacing shall be per manufacturers recommendations, if a commercial product, or 15' maximum intervals if sandbags."*

In these locations, the Construction Management Team deemed that the trench bottom had both adequate support and padding based on the uniform sandy trench bottom. This decision was documented in project directive 2015-005 (Construction in Sand Area) (see page 101 of the 2014 and 2015 ANGP QA QC Summary – 12/21/2015, provided here at **Attachment 2**), as allowed in the VGS written specification which permitted this field adjustment: "...unless otherwise directed by the Construction Management Team." Therefore, this decision complied both with the company's written specifications and Section 192.303. It also complied with 49 C.F.R. §192.319(b), which requires that the pipe be supported and protected from damage.

The DPS further points to detail 3 and 6 of the 2015 project alignment sheets (sheet with these details provided here as **Attachment 3**). Detail 3 does not apply in this situation because it is the "Typical Trench Detail-Roadways and Driveways," and there are no roadways and driveways in these locations. Detail 6 is the "Typical Trench Detail-Cross Country" and could apply in this area. The DPS states "the design drawings (details 3 and 6 on Sheet ANGP-T-G-015) clearly specify that a minimum of six inches of select backfill be placed underneath the pipe for support in the absence of sandbags or pipe pillows." However, the plan depicts a "typical" trench detail and the specification, as set forth above, calls for "...support in all locations ('pipe pillo,' stacked sandbags, or owner approved equal)," "unless otherwise directed by the Construction Management Team."

In the referenced locations, the Construction Management Team constructed the pipeline with the knowledge that pipe installed on the uniform sandy trench bottom was in fact a proper directive and an "owner approved equal" for pipe support and sand padding, as documented in VGS Project Directive

Number 2015-005, which states "...the uniform sand in the trench meets requirements for select backfill." See project directive 2015-005, at page 101 of Attachment 2.

Further, as described in the letter from Mark Hereth, VGS' outside consultant, (provided as **Attachment 4**), in the context of pipeline installation, a plan reference to a "typical" diagram shows how construction is generally undertaken but such "typical" diagrams do not foresee all possible circumstances that will be encountered during construction. Stated another way, "typical" does not mean that a plan detail will always be used. As Hereth notes, there often are circumstances that arise during construction related to topography, soil type(s), the presence of water, among others, that require adjustments to work methods be made during actual construction to safely construct the pipeline. These adjustments are referred to as "field adjustments". However, this does not mean that 49 CFR § 192.303 is not met because the regulation does not mean that every single field condition and alternative must be delineated in a written specification. See Attachment 4.

At stations 564+24 to 567+84, VGS installed the pipe directly on the trench bottom on June 17, 2016. Specification 312333 was modified in May 2016 (provided here as **Attachment 5**) and paragraph 3.3b at this time stated the following:

> *"Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Contract Drawings. Excavation shall be made to such a depth and to the width indicated on the Contract Drawings so as to allow a minimum of six (6) inches of select backfill / padding to be placed beneath and on the sides of all pipes installed unless otherwise specified on the drawings. A minimum of twelve (12) inches of select backfill/padding shall be placed above all pipes installed."*

Paragraph 3.3c stated:

> *"The bottom of the trench shall be accurately graded to provide a uniform layer of padding/bedding material, as required, for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections."*

and paragraph 3.5b stated:

> *"Pipe supports may be installed in all locations prior to backfilling as an alternative to continuous pipe bedding for the entire width of the trench. However, areas around pipe shall still be padded with select backfill as shown on the contract drawings and explained in paragraph 3.3.b. above. Stacked sandbags, pipe pillows, or owner approved equal are acceptable methods. Spacing shall be per manufacturer recommendations, if a commercial product, or 15' maximum separation if sandbags."*

The Construction Management Team constructed the pipeline in this location with the knowledge that direct installation of pipe on the trench bottom complied with the backfill specification and was an "owner approved equal" for pipe support. This is supported by the email from Brendan Kearns, CHA Engineer to John St. Hilaire on June 22, 2016, which stated "If the material 6" below the bottom of the trench is deemed to be suitable material (per specifications) by the CM team, then the pipe can be laid in the bottom of the trench as long as it is sufficiently supported as stated in 3.3.C." To ensure the pipe in this location met specifications, VGS conducted a test dig on 9/27/2016 to inspect the pipe and to analyze the trench. The report shows that the soil at the bottom of the trench and six inches below was in fact suitable for padding material. See **Attachment 6** (VGS 06.06.17 Memorandum regarding ANGP Pipe Laid on Trench Bottom which incorporates the quoted information).

In continuing conversations with DPS, VGS learned that the DPS wanted express written methodology that reduced construction team discretion. To meet that request, the VGS team decided on July 5, 2016 that VGS would no longer allow pipe to be installed directly on the trench bottom. This is memorialized in RFI#: ANGP-VGS-RFI-025 and was communicated to the DPS by email From Chris LeForce to GC Morris and Louise Porter on July 7th, 2016. See Attachment 6.

Detail 3 of the project alignment sheets again does not apply here because it is not under roadways and driveways. Detail 6 was updated in May 2016 (provided as **Attachment 7**) to expressly state in note 1: "Refer to technical specifications for both general and select/padding backfill requirements;" and note 5: "For pipe support methods and other pipe-in-trench requirements, refer to technical specifications." These changes were made to make clear that the plan drawings were "typical" depictions and that the specifications controlled installation, to address the Department's input.

At stations 1635+00 and 1642+00 to 1660+00, the DPS states "VGS also installed the pipe without support in at least two locations."

The DPS' filing does not indicate how they determined the pipe was installed without support in this location. VGS has a Lower-in/Padding/Backfill Daily Report for September 6, 2016 (provided as **Attachment 8**) that documents sand bag supports were installed from station "1633+00 to 1655+55." However, VGS believes that this report contains a typo and that the stationing should be **1633+00 to 1635+55**. This is based on the reported length in the daily total column, which shows 255 ft. Therefore, VGS believes the DPS conclusion regarding inadequate pipe support at the 1635+00 location is incorrect, because sand bag support was in fact used at this location.

VGS did install the pipe directly on the trench bottom in the area of the so-called "clay plains swamp," from approximately station **1642+00 to 1660+00**. As described in VGS' filings in the Depth of Cover investigation before the Public Utility Commission, the contractor used a method for a portion of this area where the pipe was installed in the trench by digging alongside the pipe to displace wet, muddy soil and thereby lowering it. This field adjustment was appropriate for the conditions present in the swamp and by placing it directly on the trench bottom firm support was provided. The pipe in this area was concrete coated, which provides an extra level of protection to the pipe and the pipe coating. Furthermore, in special natural resource areas, VGS was expected to backfill the trench with native material, which is how this location was constructed.

VGS Response to DPS reported corrosion concern:

In the NOPV, the Department states, "...the Department is concerned that this installation may have an increased susceptibility to corrosion due to differing soil conditions above and below the pipe, and unknown materials in the soil below the pipe." While the DPS' NOPV filing does not cite authority for its stated concern, VGS believes the DPS' statement is based upon James B. Bushman's "Corrosion and Cathodic Protection Theory" white paper, which it provided to VGS in June 2016 (provided here as **Attachment 9**). VGS and the Department have discussed this white paper, the topic of corrosion generally and VGS' view of the white paper on a number of occasions during discussions and in-person meetings on the ANGP.

Mark Hereth reviewed the white paper by Mr. Bushman and reports in his attached letter that he does not agree that the mere presence of differing soil conditions above and below the pipe will result in an increased susceptibility to corrosion, particularly where cathodic protection is used. As Hereth explains, soil types differ throughout a pipeline installation, as the pipe transitions through different types of terrain and as installation methods change. Examples include open farm field to a wetland area, sandy soils to silt/clay, and from open cut installation to a horizontal directional drill (HDD). Regardless of soil type, in addition to pipeline coating, cathodic protection is applied to the pipe to protect it from external corrosion. See Attachment 4.

<u>History of VGS Submittals to Department of Public Service on Pipe Bedding and Support:</u>

VGS has been actively engaged with the DPS regarding concerns raised during the installation regarding pipe bedding and support and corrosion issues throughout construction and since.

12/21/2015: VGS Gas-up Execution Plan for Segment 1 included VGS' QA QC Summary for 2014 and 2015 Activities. Tab 1 (Introduction) contains the ANGP QA QC Executive Summary and Tab 8 (Trenching and Backfilling) of the QA QC binder included ANGP Project Directive 2015-005, which is referenced above. See Attachment 2.

07/07/2016: Chris LeForce email including response to ANGP-VGS-RFI-025-R0 RESP and attachment from CHA that details intent and clarification on the various methods for trench bottom preparation under Specification 312333 (email is contained in Attachment 6).

6/9/2017: As follow up to DPS questions on the topic, Adam Gero submitted a Memorandum as justification for the VGS decision to allow the areas on ANGP where pipe was laid directly on the trench bottom to remain in place. The memo outlines the areas where pipe was installed without sand bags; details related to the specification in effect at the time; and VGS decision to require sand bags instead of sand berms or laid directly on trench bottom. See Attachment 6.

Finding Number 2: Trench Breakers

<u>DPS Finding:</u>

"[T]rench breakers were not installed as designed in numerous locations … Also, there were some trench breakers installed where there was not a designed location." "The Department believes that installing trench breakers in the above-described manner (especially without a formal documentation process when deviating from written specifications) was not in accordance with VGS's written specifications, and is therefore a violation of 49 C.F.R. §192.303. In addition, the Department is concerned that this installation may have an increased susceptibility to soil erosion around the pipe, which may affect the integrity of the pipe."

Code Section(s) Cited by DPS:

49 CFR §192.303 Compliance with specifications or standards.
Each transmission line or main must be constructed in accordance with comprehensive written specifications or standards that are consistent with this part.

CPG, Plans, & Specifications relevant to DPS NOPV:

CPG Final Order Paragraph 2 in Docket 7970 states: "Construction of the proposed Project shall be in accordance with plans and evidence as submitted in this proceeding. Any material deviation from these plans or a substantial change to the Project must be approved by the Board."

VGS Specification 312333, as discussed below.

VGS Alignment Sheet ANGP-T-G-015, #2 - Permanent Trench Breaker Spacing Guideline (provided as **Attachment 10**).

VGS Response:

After the 2014 construction season, VGS became aware of the fact that some trench breakers may not have been installed where design calculations would have located them. At the time of the installation, VGS Specifications did not expressly address trench breaker installation or show specific locations for trench breakers to be installed. In later versions of the specifications, Section 312333 explicitly stated that "trench breakers shall be installed per construction plan details prior to backfilling operations begin." The construction plans showed a chart for reference and stated "spacings shown are recommended guidelines, OSPC representative may adjust spacing in the field" and still did not show specific locations for trench breakers to be installed. This authorized field personnel to determine the best locations during construction.

After the 2014 construction season, VGS initiated a QAQC process to assess the appropriateness and spacing of trench breaker installation. The QAQC team did a study and issued the Corrective Action Report (CAR) #2015-006 (see pp. 64-65 of Attachment 2), which concluded that the locations could have been better established and outlined an action plan.

The trench breaker spacing assessment was documented in the QAQC section of the "VGS Gas-up Execution Plan for Segment 1." This was submitted to the DPS on 12/21/2015. The final CAR, dated 8/17/2017, signed by John St.Hilaire (provided here as **Attachment 11)** states "This line segment was monitored throughout 2016 through aerial patrols and the 2016 walking survey. No areas of concern were observed. VGS continues to monitor this segment of the 12-inch transmission line as part of its overall transmission line patrols." Through monitoring, VGS can inspect the segment for erosion and address and remediate as necessary.

Although VGS feels that there were potentially better locations for some of these trench breakers, VGS' review indicated the installed trench breaker configuration did not pose any safety risk. Furthermore, the specifications and plans allowed for field placement of the trench breakers.

History of VGS Submittals to Department of Public Service on Trench Breakers:

12/21/2015: VGS provided GC Morris and Louise Porter with VGS Gas-up Execution Plan for the 1st segment, which included the QAQC Summary for 2014 and 2015 (dated 12/18/2015). Section 5 included information related to the trench breakers and is titled "2014 - Specification Deviation." See Attachment 2.

9/7/2017 Adam Gero provided the final CAR 2015-006 to the DPS. See Attachment 11.

Additional Subject of Concern: Pipe Coating (No Allegation of Probable Violation)

DPS Discussion:

"Through its QA/QC program, VGS identified multiple varieties of coating patches (used to patch anomalies in the mill-applied protective pipe coating) that exhibited adhesion failures. Once identified, VGS discontinued the use of these types of patches. In addition, VGS identified certain manufactured lots of Canusa sleeves ("wraps") that exhibited adhesion failure. Two hundred and ninety-six (296) sleeves were on unburied pipe and were replaced. Sixty-seven (67) sleeves are on installed sections of pipe."

"In two locations where horizontal direction drilling ("HDD") was used (Route 2A and Monkton Swamp), VGS noted extensive pipe coating damage when pulling the pipe out the far end of the bore. VGS continued pulling pipe until it determined coating damage was within acceptable limits and removed the damage section of pipe; however, it is possible that there are areas of coating damage remaining underground."

"While the Department is not at this time considering the above two items (patch adhesion failure and HDD damage) to be code violations, the Department is concerned that these two issues could, over time, present a corrosion risk to the pipeline. The Department is including these coating items in this NOPV because the remedial actions sought to monitor these coating concerns are the same remedial actions recommended for the pipe support and trench breaker items."

Code Section(s) Cited by DPS:

49 CFR §192.455: External corrosion control: Buried or submerged pipelines installed after July 31, 1971.

(a) Except as provided in paragraphs (b), (c), and (f) of this section, each buried or submerged pipeline installed after July 31, 1971, must be protected against external corrosion, including the following:

(1) It must have an external protective coating meeting the requirements of §192.461.

49 CFR §192.461: External corrosion control: Protective coating.

(a) Each external protective coating, whether conductive or insulating, applied for the purpose of external corrosion control must–

(1) Be applied on a properly prepared surface;

(2) Have sufficient adhesion to the metal surface to effectively resist underfilm migration of moisture;

(3) Be sufficiently ductile to resist cracking;

(4) Have sufficient strength to resist damage due to handling and soil stress; and,

(5) Have properties compatible with any supplemental cathodic protection.

(b) Each external protective coating which is an electrically insulating type must also have low moisture absorption and high electrical resistance.

(c) Each external protective coating must be inspected just prior to lowering the pipe into the ditch and backfilling, and any damage detrimental to effective corrosion control must be repaired.

(d) Each external protective coating must be protected from damage resulting from adverse ditch conditions or damage from supporting blocks.

(e) If coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation.

CPG, Plans, & Specifications relevant to DPS Concern:

CPG Final Order Paragraph 2 in Docket 7970 states: "Construction of the proposed Project shall be in accordance with plans and evidence as submitted in this proceeding. Any material deviation from these plans or a substantial change to the Project must be approved by the Board."

VGS Response:

The DPS refers to "multiple varieties of coating patches (used to patch anomalies in the mill applied protective coating) that exhibited adhesion failures. Once identified, VGS discontinued the use of these types of patches." While these type of coating patches are widely used in the industry for this application, VGS agrees with this assessment that there were failures of these patches on the pipeline. VGS repaired any patch that was failing and discontinued using the product in Sept. 2015 (CAR 2015-003), see Attachment 2, at 76-77. While some of these patches remain on the pipeline, all areas were visually inspected and jeeped before the pipe was lowered in the trench. "Jeeping" refers to a technology that identifies coating holidays. A "holiday" is a discontinuity or defect in pipe coating, such as a pinhole, void, crack, or insufficient thickness of the coating. Any coating holiday found was repaired before the pipe was installed.

DPS also states "...VGS identified certain manufactured lots of Canusa sleeves ("wraps") that exhibited adhesion failure." VGS disagrees with this statement and documented its findings in the Report on Canusa Shrink Sleeve Peel Tests as part of submittals associated with the Geprags to Middlebury Gas-up

Plan, Exhibit N - QAQC Executive Summary Geprags to Middlebury (provided as **Attachment 12**). Adhesion failure does not constitute a failure of the coatings' ability to protect the pipe.

For the two HDD locations that the DPS refers to, VGS followed the acceptance procedures regarding the pipe pullback for a HDD. At both locations, VGS did find coating damage and followed its procedure, which required it to continue to pull pipe until no damage was found to the pipeline corrosion coating. This was completed at both locations. This acceptance procedure for inspecting HDDs by evaluating the pipe as it is pulled out of the bore and assuring that the coating is within acceptable limits reduces the risk that there will be coating damage underground. Further, the DPS project inspector, John McCauley, was onsite and witnessed the coating evaluation during the final acceptance of the Monkton Swamp HDD and did not indicate any issue with the acceptance.

VGS regularly monitors its cathodic protection system per 49 C.F.R. 192 to ensure it meets the requirements of the code and remediates any deficiencies indicated by the monitoring. The additional remedial actions agreed to in connection with this NOPV may expedite the identification of any issues related to pipe coating.

History of VGS Submittals to Department of Public Service on Coating:

3/12/2015 Kristi Oxholm sent GC Morris the ANGP Inspection Forms for HDD activities. This forms included the HDD Daily Inspector report (which references inspection criteria), HDD Coating Report – Below Ground, and HDD Jeeping and Coating Repair Report).

12/21/2015: VGS Gas-up Execution Plan for the 1st segment was submitted to GC Morris and Louise Porter and included VGS' QAQC Summary for 2014 and 2015 activities. Tab 9 of the QAQC binder (dated 12/21/2015) included CAR 2015-008, which summarizes the information and actions taken for the 2A HDD. See Attachment 2.

9/7/2016: Adam Gero sent email to GC Morris which included file "Monkton Swamp HDD Memo" (provided at **Attachment 13**). The memo documents that John McCauley (state's project inspector) was onsite during final inspection and includes pictures, the completed HDD Inspector's QA checklist, and the completed HDD Pullback QAQC checklist.

11/15/2016: VGS gave GC Morris files related to HDD installations including the VGS Corrective Action report (CAR 2015-008) for the Route 2A HDD installation and associated report by EN Engineering for coating integrity analysis. See Attachment 2

11/18/2016: Shana Kane sent email to GC Morris, which included documents related to HDD criteria used during the ANGP. The documents included the 2014 VGS procedures for performing HDD and pulling steel pipe by HDD and four versions of the HDD Pull-Back Plan (dated 9/10/2015, 9/29/2015, 12/1/2015 and 5/20/2016).

Attachment 1

TECHNICAL SPECIFICATIONS

FOR

Vermont Gas Systems, Inc.
85 Swift Street
South Burlington, VT 05403

Addison Natural Gas Project (ANGP)
Phase 1

PREPARED BY:

CHA

38 Eastwood Drive, Suite 105
South Burlington, VT 05403

April 29, 2015

PROJECT NO.: 28757

SECTION 312333 - TRENCHING, PIPE LAYING AND BACKFILLING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the excavation of trenching, pipe laying, backfilling, compacting, dewatering, excavation support and disposal, as shown on the Contract Drawings, and as herein specified.

B. The Construction Management Team will determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

A. Reference Standards:

   1. The latest edition of the following standards, as referenced herein, shall be applicable.

      a. "Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)."

      b. American Society for Testing and Materials (ASTM).

      c. Vermont Agency of Transportation (VTrans) Standard Specifications

B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State.

C. The Owner shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications, in accordance with Section "Quality Requirements."

1.3 SUBMITTALS

A. The Contractor shall submit certified gradation curves and moisture-density compaction results for each imported material. If multiple sources are utilized, information shall be submitted from each individual supplier.

B. Pipe support systems: Contractor shall submit method of pipe support system(s) to be utilized, including details on how supports will be installed.

C. Contractor shall submit details/designs for all shoring and trench boxes for excavations that exceed 20’ in depth. Details and designs shall be sealed by a registered Vermont Professional Engineer.

1.4 PROJECT REQUIREMENTS

A. Call Dig Safe at 811 before starting any excavation or verify that a Dig Safe ticket exists and is valid for the area. Contractor shall maintain Dig Safe marks and follow all Dig Safe laws. Contractor is responsible for contacting and complying with municipal and private utilities that are not members of Dig Safe. Excavate with care to avoid damage to structures and utilities - excavations shall be completed by hand if necessary. Promptly report any damages to utilities to Utility Owner and Construction Management Team, do not attempt repairs without the Utility Owners consent.

B. Notify the Construction Management Team and Owner of any unexpected subsurface condition.

C. Protect excavations by shoring, bracing, sheet piling, or by other methods, as required to ensure the stability of the excavation. Comply with VOSHA/OSHA requirements.

D. Underpin or otherwise support structures and improved surfaces adjacent to the excavation which may be damaged by the excavation. This includes service lines and existing utilities.

E. Contractor is responsible for protection of Existing Utilities:

  1. Specifically, Contractor shall use extreme protection around existing 10-inch transmission main in the vicinity of the Colchester Tie-in Site. This is the primary feed for the Burlington area. Owner will locate/flag the line prior to Contractor beginning work in this area. Contractor shall take all measures necessary to protect this existing transmission main during construction. The Owner must be present for any work or excavation around the existing 10-inch transmission main.

  2. Contractor will notify Owner before excavating around, or crossing, any existing natural gas distribution lines. Owner will determine if Owner should be present during any work.

  3. Locate existing underground and above ground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.

  4. If necessary, coordinate interruption and/or termination of utilities with the utility companies and the Owner.

  5. Provide a minimum of seven days notice to the Owner and receive written notice to proceed before interrupting any utility.

F. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified.

G. Repair any damaged utilities as acceptable to the Owner, Construction Management Team, and utility companies at no additional cost to the Owner.

H. Contractor shall comply with maintenance and protection requirements as approved by the authority having jurisdiction.

I. Protection of Persons and Property:

  1. Barricade open excavations occurring as part of this work and post with warning lights, if required or comply with any applicable permits.

  2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by construction operations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Select Backfill/Pipe Padding:
   1. On-site material: The use of on-site native material for select backfill/pipe padding shall be approved and inspected by the Construction Management Team. Native material shall not contain any stones that are larger than 1.5” in the longest dimension. A shaker bucket or screen may be used if native material is too large.
   2. Borrow Material: If native material is not acceptable, as determined by the Construction Management Team, a sand material shall be imported to the site meeting the following criteria. Alternate select backfill/pipe padding materials may be submitted by the Contractor for review and approval from Construction Management Team.

Sieve	**Percent Passing**
1-1/2"	100
½”	70 - 100
No. 4	60-100
No. 100	0-20

B. General Backfill: Native materials containing no stones or clods larger than 3” in the longest dimension are acceptable. If native material is not acceptable, as determined by the Construction Management Team, bank run gravel fill shall be imported to the site meeting the following criteria. General backfill area will be limited to the trench, or a maximum of 12-inches laterally from each side of the pipe. Alternative general backfill materials may be submitted by the Contractor for review and approval from Construction Management Team.

Sieve	Percent Passing
3”	100
No. 4	20 - 60
No. 100	0 -12
No. 200	0 - 6

PART 3 - EXECUTION

3.1 PRECONSTRUCTION MATERIAL QUALIFICATION TESTING

A. General:

1. Sufficient size samples shall be obtained from the potential borrow source to allow completion of tests listed in paragraph B below. Samples may be obtained from test borings, test pits, or from borrow pit faces provided that surficial dry or wet soil is removed to expose undisturbed earth. Tests listed below shall be performed on each sample obtained. A minimum of three (3) representative samples from each potential borrow source shall be furnished to the testing laboratory for prequalification testing.

B. Material Tests:

1. Particle Size Analysis:
    a. Method: ASTM D422
    b. Number of Tests: One (1) per sample; three (3) per potential source.
    c. Acceptance Criteria: Gradation within specified limits.

2. Maximum Density Determination:
    a. Method: ASTM D1557 - Modified Proctor
    b. Number of Tests: One (1) per sample; three (3) per potential source.

3. Re-establish gradation and maximum density of fill material if source is changed during construction.

3.2 PREPARATION

A. Establish required lines, levels, contours and datum.

B. Maintain benchmarks and other elevation control points; re-establish if disturbed or destroyed, at no additional cost to the Owner.

C. Establish location and extent of existing utilities prior to commencement of excavation.

3.3 EXCAVATION

A. All excavation shall be made to such depth/width as required to provide suitable room for laying pipe and for sheeting, shoring, pumping and draining as necessary, and for removing peat, silt, or any other deleterious materials which the Construction Management Team may deem unsuitable. Hand trench excavation may be required to protect existing utilities and structures.

B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Contract Drawings. Excavation shall be made to such a depth and to the width indicated on the Contract Drawings so as to allow a minimum of six (6) inches of select backfill / padding to be placed beneath and on the sides of all pipes installed unless otherwise specified on the drawings. A minimum of twelve (12) inches of select backfill/padding shall be placed above all pipes installed.

C. The bottom of the trench shall be accurately graded to provide a uniform layer of padding/bedding material, as required, for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.

D. Stockpile excavated subsoil for reuse where directed or approved.

E. Over excavation/under cut: If, in the opinion of the Construction Management Team, existing material below the trench grade is unsuitable for properly placing select backfill/padding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved select backfill/padding material properly compacted.

F. Stability of Excavation: Slope sides of excavations shall comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavation in safe condition until completion of backfilling.

G. Removal of materials beyond the indicated elevations, without authorization by the Construction Management Team, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

H. If a trench excavation crosses a road, sidewalk, bike path, driveway, or other transportation facility, the Contractor shall arrange temporary facilities for ingress/egress of all pedestrians and vehicles. One lane of traffic shall be maintained at all times – refer to VTrans/Local permits for additional construction conditions and traffic management details.

3.4 DEWATERING

A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the work is completed and excavation is backfilled or have sufficient weight to resist uplift pressures. Groundwater levels shall be depressed to a minimum of 2 feet below excavation subgrade. No pipe or structure is to be laid in water and water shall not be allowed to rise on or flow over any pipe or structure until such time as approved by the Construction Management Team.

B. Provide a suitable point of discharge from dewatering operations shall be conveyed in a non erosive manner satisfactory to the EPSC Specialist and Construction Management Team and all applicable environmental permit regulations.

C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected to the satisfaction of the Construction Management Team.

3.5 BEDDING AND BACKFILLING

A. Contractor shall take all necessary precautions to ensure that backfill materials are kept free of all skids, stumps, welding rods, cans, bottles, trash and other deleterious debris.

B. Pipe supports shall be installed in all locations prior to backfilling, unless otherwise directed by the Construction Management Team – refer project design drawings for further requirements. Stacked sandbags, pipe pillows, or owner approved equal are acceptable methods. Spacing shall be per manufacturers recommendations, if a commercial product, or 15’ maximum intervals if sandbags.

C. Trench breakers shall be installed per construction plan details prior to backfilling operations begin.

D. All pipe trenches backfill (select backfill/padding, general backfill, subbase) shall be thoroughly compacted by mechanical means as follows:

1. Typical Cross-country areas: Thoroughly compacted by mechanical means to avoid any future trench settlement.
2. VELCO corridor: All backfill in pipe trenches in the VELCO corridor shall be compacted to a minimum of 90 percent of modified Proctor maximum dry density by installing 12-inch (maximum) loose lifts.
3. Existing and Proposed Road Areas (unpaved and paved): All backfill in pipe trenches in, or directly adjacent to (with 10’ of edge of road surfaces – existing or proposed) road surfaces, shall be compacted to a minimum of 95 percent of modified Proctor maximum dry density. Backfill materials shall be placed with water content within plus or minus 3 percent of optimum moisture content per the modified Proctor method (ASTM D1557). Any water used for compaction shall be provided by the Contractor at their own expense. The Contractor is responsible for the repair of any trench settlement at no expense to the Owner for the period of one year after substantial completion of the project.

E. Provide uniform bearing and support for pipe in all locations, except where necessary to excavate for connections, tie-ins, and other required appurtenances. Dig no deeper, longer, or wider than needed to make the joint connection properly.

F. The bedding/padding material shall be placed to the full width of trench. The bedding material shall be placed evenly along the bottom of the trench to provide proper support of the pipe to the elevation shown on the Contract Drawings or directed by the Construction Management Team. . The backfill shall be placed on both sides of the pipe at the same time and to approximately the same elevation. Any pipe that is damaged or moved out of alignment, regardless of cause, shall be replaced or realigned at the Contractor's expense. Bedding/padding shall be thoroughly compacted by hand-tamping or mechanical means being careful not to damage the pipe. When the bedding/padding reaches one (1) foot over the top of the pipe, the entire surface shall be compacted by mechanical means.

3.6 PIPE STRINGING & LAYING

A. Pipe shall be installed per the depth, alignment, and coating type shown on the project design plans. Depth of cover shall be measured from top of pipe to finished/final grade (after site restoration).

B. Stringing

1. No pipe shall be strung before the trench is excavated to full depth and accepted by the Owner to meet the requirements of this specification. Pipe shall not be placed directly on the ground, but on wooden skids with proper protective padding. The skids and protective padding material shall be subject to Construction Management Team approval. Dragging, skidding or dropping the pipe is not permitted. Wooden wedges shall be used to prevent movement of each strung pipe.
2. Where possible the skid elevations shall be planned such that minor differences between grade profile and bottom of trench profile (e.g. at locations where an increased trench depth is required) can be accommodated without an additional tie-in. The distance between the trench edge and the pipe string shall be planned such that safe working space is provided. Contractor shall follow applicable OSHA/VOSHA regulations.

3. Contractor shall be responsible for proper stringing and locating of the pipe by coating type.
4. Contractor shall string the pipe in such a manner so as to cause no interference with public roads, sidewalks, or bike paths. Suitable gaps shall be left at intervals as necessary to permit the passage of livestock and/or equipment across the right-of-way and as directed by the Construction Management Team.
5. Contractor shall layout and measure the pipes such that the number of pieces required to be cut-off with less than 5 feet in length is kept to a minimum.
6. Pipe shall be strung with the use of a spreader bar and two guide lines.

C. Bending - Contractor shall make all necessary field pipe bends required in construction of the pipeline. The Contractor shall be responsible for determining the degree of the field bend necessary where a change in direction is necessary.

1. All bending shall be completed using the cold smooth method using a bending machine, approved by the Construction Management Team. Wrinkle bends will not be acceptable. Welded longitudinal pipe seams shall be right angles (neutral axis) to the direction of the bend. The Contractor shall use an internal bending mandrel to achieve smooth and undistorted bends. Padded bending shoes are required for coated pipe. Heating the pipe for bending purposes is not allowable. Prior to beginning work, Contractor shall submit and demonstrate their bending procedure, which shall conform to the recommendations of the manufacture of the bending machine. This procedure shall be approved by the Construction Management Team prior to beginning work.
2. For field cold bends, the longitudinal axis shall not be deflected more than 1-1/2 degrees in any length along the pipe access equal to the diameter of the pipe. The maximum diametrical reduction in a pipe bend shall not exceed 2-1/2% of the nominal pipe diameter. There shall be no deviation from the above requirements without prior written approval from the Construction Management Team. Individual approvals shall be obtained for each application.
3. The distance between centerline of bending points shall be such that there will be no distortion of the pipe or of the bend previously made and in no event shall be closer than seven (7) feet to the end of the joint of the pipe. When pipe is double jointed before bending, the bend shall not be closer than three (3) feet to the butt (girth) weld.
4. Bends shall not be straightened under any circumstances.
5. Pipe that is buckled, wrinkled, flattened, egged or gouged, as determined by the Construction Management Team, by bending operations shall be cut out and replaced at the sole expense of the Contractor. Hammering, the use of jacks, or other mechanical machinery to repair bucked or deformed pipe is prohibited. A buckle shall be defined as any anomaly in the contour of a bend which, when measured with a six (6) inch metal straight edge oriented on the longitudinal axis, yields a depression or void beneath the straight edge equal to, or greater than, 0.06”.
6. For pipe line-up, the pipe shall be placed on skids with sufficient clearance between the bottom of the pipe and ground to accommodate the finishing weld. Pipe shall be handled in a manner to prevent damage to the pipe walls and shall be placed over or parallel to the ditch in such manner that when the pipe is lowered, the bends will rest in the ditch at the proper location. In the laying of the pipe other than seamless pipe, the longitudinal seams shall be offset by 20 degrees on adjoining pipes in the top 120 degrees of the pipe and welded sections shall be assembled and lowered into the trench so that the longitudinal seams will remain on the top 120 degrees of the pipe as laid. Exceptions shall be weld seams on side bends, which shall be located on top of the pipe, and weld seams on sag bends and over bends, which shall be located on either side of the pipe as laid.

7. Contractor shall make all necessary bends required for proper construction of the pipeline, following a trigonometric survey to establish the number and degree of bends required, to ensure that the installed pipe conforms to the contours of the excavated trench.

D. Welding – Refer to Specification 137000

E. Coating Weld Joints and Fittings – Refer to Specification 138000

F. Lowering – Prior to lowering the pipe into the trench, the Contractor shall ensure that all water, debris, skids, rocks, welding rods and other foreign or deleterious material is removed from the trench. During lowering operations coated pipe shall be handled by use of adequately spaced lowering belts or cradles, as determined to be acceptable by the Construction Management Team, but shall be a maximum of 250'. At a minimum, belts shall be equal to the outside diameter of the pipe and shall be made of material that is free of protrusions that may cause damage to the protective coating. Roller cradles shall have nylon/neoprene roller wheels. The pipe shall be lowered into the trench in a manner that will allow proportional distribution of the total weight of the pipeline to all of the lifting points to prevent undue stress or strain on the pipe and to prevent damage to the pipe coating. The pipe shall not be dropped or subjected to jarring or impact. At water crossings or any other locations which may require pulling or dragging of the pipe into place, the coated pipe shall be properly protected from damage using wood lagging or rollers. Welded pipe strings shall be lowered-in within 96 hours of completion of joint coating.

G. Holiday Inspection – Holiday inspection ("jeeping") shall be performed on all pipe and fittings with an electronic holiday detector, supplied by the Contractor and operated in such a manner to audibly and visually detect the presence of all holidays in the coatings. Jeeping shall be completed twice (minimum) – once when on skids adjacent to trench, and again as it is lowered into the ditch. Additional jeeping may be required as determined by the Construction Management Team. Refer to Coatings, Specification 138000 for additional jeeping requirements.

H. Rock Shield – Contractor shall furnish and install Tuff N Nuff 11 mm rockshield, or Construction Management Team approved equal, on the pipeline in areas of rock trench or as otherwise directed by Construction Management Team or utility inspector.

I. Trench Breakers – Trench breakers shall be installed as defined on the project design drawings.

J. Electrolysis Test Leads – Locations for test leads are determined on the project design drawings and shall be connected prior to backfilling operations – follow Cathodic Protection Details for installation. If an electrical continuity test fails after backfilling operations, Contractor shall excavate and replace test lead at no cost to the Owner. All test lead cables shall be continuous with without splices.

K. Drainage Tile Repair – Tiles within the limit of disturbance that are damaged shall be repaired by the Contractor.

1. The replacement tile shall be installed to the gradient and alignment of the previous tile. Tile shall be supported at trench crossings as necessary in order for the tile to maintain the gradient/alignment during backfilling operations.
2. Replacement tile materials shall be new. Reusing excavated existing drain tile is not acceptable.
3. Drain tile couplings shall be utilized to splice in new drain tile. Couplings shall be installed per the manufacturer's recommendations.
4. During backfilling operations, soil adjacent to and under tiles shall be compacted to eliminate future settlement.

5. In areas where the tile alignment is parallel and directly adjacent to the pipeline alignment, the tile will be moved/offset to the side of the pipeline alignment.
6. Tile and pipeline separation shall be a minimum of 12-inches.
7. Conditions in construction line list regarding existing and future tile locations shall be adhered to by the Contractor.
8. If directed by Construction Management Team, both existing and replacement tiles shall be inspected to ensure that tiles are not plugged, crushed, mis-aligned, or otherwise damaged. If damage is found, tile shall be repaired at no cost to the Owner.

L. Warning Tape – Contractor shall install Owner provided pipeline warning tape as indicated on project design drawings.

M. Pipeline Markers – After completion of backfilling operations, Contractor shall install Owner supplied pipeline markers as directed by Construction Management Team.

3.7 BACKFILLING AROUND STRUCTURES

A. The Contractor shall not place backfill against any structure without obtaining the approval of the Construction Management Team. No dumping shall be allowed where materials would flow against or around such structures. Backfill material shall be deposited in horizontal layers not exceeding 6 inches in loose thickness or as shown on the Contract Drawings and thoroughly compacted by hand or by mechanical means to the satisfaction of the Construction Management Team.

3.8 SUSPENSION OF WORK

A. Whenever the work is suspended, excavations shall be protected and the roadways, if any, left unobstructed. Within or adjacent to private property, material shall be stored at such locations as will not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.9 DISPOSAL OF MATERIAL

A. Excess and unsuitable materials shall be legally disposed of by the Contractor off site at the Contractor’s expense unless otherwise approved by the Owner.

3.10 FIELD QUALITY CONTROL

A. Notify the Construction Management Team at least three (3) working days in advance of all phases of excavation and backfilling operations. The contractor shall not conduct backfilling operations unless the Construction Management Team is present for inspections. Backfilling operations shall commence as soon as possible after the pipe has been lowered into trench. The amount of lowered pipe that is not backfilled shall be kept at a minimum at all times. Contractor shall not backfill trench until the Owner’s as-built survey crew has completed their necessary tasks.

B. In-place density testing at road crossings and VELCO corridor shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:

1. In-place relative density:

   a. Method: AASHTO T238, Nuclear Method

C. Perform initial density testing to verify that contractors proposed compaction effort will obtain the minimum required densities.

D. In-place density tests on trench backfills shall be provided as follows:

1. Open-cut road crossings: One test per lift and at least once daily.
2. Cross-country areas: Visual only – subject to Construction Management Team approval.
3. VELCO corridor: Minimum of one every 500 cubic yards of fill, and not exceeding every 2 feet vertically, or once daily.

E. The Construction Management Team may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions.

F. Acceptance Criteria: The criteria for acceptability of in-place fill shall be both visual and in-situ dry density and moisture content. If a test fails to qualify, the fill shall be further compacted and re-tested/inspected. Subsequent test failures shall be followed by removal and replacement of the material, at no cost to the Owner. Minimum compaction of backfill materials noted in Section 3.5.D of this specification.

END OF SECTION

Attachment 2

Vermont Gas

ANGP
QA QC
Summary

12/21/2015

Vermont Gas

QA QC
Summary

1 Introduction
2 2014 - Welding
3 2014 – Trenching & Backfill
4 2014 – Depth of Cover
5 2014 – Specification Deviation
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TAB 1

Vermont Gas

MEMORANDUM

To: ANGP File
From: Kristy Oxholm
Date: December 21, 2015
Re: Addison Natural Gas Project (ANGP) QA/QC Executive Summary

While no QA/QC program can assure 100% perfection on any project, Vermont Gas Systems, Inc. (VGS) has implemented QA/QC requirements to assure the highest levels of quality are adhered to. In circumstances where quality is questioned, appropriate follow-up remediation and/or mitigation is implemented.

For the 2014 construction season QA/QC requirements were incorporated into various documents, such as the construction specifications, VGS Operations & Maintenance (O&M) Manual and Addison Natural Gas Project Inspector's Manual. Part way through the project it was determined that a more robust QA/QC system would benefit VGS and ANGP.

A significantly enhanced QA/QC program was implemented with the introduction of the VGS Quality Assurance Plan in June of 2015. The framework of this plan was developed by Storti Quality Consulting. A committee of VGS representatives then worked to customize it for use within VGS. The objective of the plan is stated as:

> Vermont Gas Systems is committed to performing work to the highest standards of quality while ensuring compliance with applicable regulations, policies and procedures. The objective of this plan is to ensure that all employees and contractors performing work or constructing new transmission and distribution system share the company's commitment. The Plan provides the structure for effective quality assurance and quality control, but it is the responsibility of all employees and contractors to embrace the need for, and value of, performing work with a high degree of quality and to have a healthy questioning attitude when encountering situations or conditions that may be adverse to quality.

To reduce the need for multiple documents, applicable requirements found in the VGS O&M Manual were incorporated into the construction specifications for the 2015 construction season, In addition, the 2015 Inspector's Manual was assembled using the construction specifications to aid clarity.

One of the items included in the VGS Quality Assurance Plan is the Corrective/Preventive Actions Procedure. This procedure was implemented to address Conditions Adverse to Quality (CAQ) with Correction/Preventive Action Requests (CAR) and document remedial actions that return the condition to an acceptable quality or detail other actions that mitigate quality concerns. These CARs address CAQs which have occurred. VGS retroactively applied this procedure to items from the 2014 construction season for purposes of having consistent documentation throughout the project.

Summary

VGS identified areas which were addressed through Quality Assurance processes as well as areas in which there may be information that we do not know. To gain insight into what we don't know, interviews were conducted with members of the project management team, inspectors and contractors. The details of each identified area are included in the tabbed section of this report and are summarized here.

2014 Items

Welding (TAB 2)

There was the possibility that welders had more than one WPS available to them and could have used the incorrect procedure on some welds. Both of the procedures in question were qualified procedures. This concern broadened to include document control on VGS welding documents. ***This concern was addressed with an extensive update to the VGS welding plan and requalifying the procedures which are now in use.***

There was less than 100% inspection coverage for visual inspection of welds. There is no requirement, either contractual or statutory for visual inspection of each weld if it is inspected by non-destructive evaluation, therefore no CAR was issued. ***Welding quality has been addressed by performing 100% Radiography on the welds on this project.***

Coatings

There are 340 welds for which we have no corresponding coating report. Based on as-built records, 15 of these were coated with 2 part epoxy and the balance was coated with Canusa Sleeves. These numbers reflect having one coating inspector for three coating crews. There is no requirement, either contractual or statutory, to having a coating report for each coating application, therefore no CAR was issued. During excavation to assess the reports of trash/garbage/debris in the backfill, two of the welds with no associated coating reports were exposed. The coating appeared to be in good condition, further indicating that no CAR was necessary. ***The commissioning of the cathodic protection (CP) system and a direct assessment survey (to be conducted in the spring of 2016) provide mitigation measures to address this concern.***

Trenching & Backfill (TAB 3)

There was concern as to whether proper backfill was used in all areas where construction occurred in 2014. We are uncertain of specific locations where improper backfill may have been used. ***The only areas we are certain were an issue are a few locations that were noted during the lowering of pipe to address depth of cover issues. In those cases, any improper backfill was removed and replaced with proper backfill as part of the lowering process. No damage to the pipe or coating was noted. The caliper tool run will locate any dents or deformations that could be a result of the pipe being in contact with improper backfill. The commissioning of the cathodic protection (CP) system and a direct assessment survey (to be conducted in the spring of 2016) provide additional mitigation measures to address any concern about potential coating damage. In-line Inspection (ILI) will be used in the future to monitor any issues. A CAR will be issued at that time if appropriate.***

Reportedly there was trash/garbage/debris in backfill used in the ROW and directly over the pipe along Redmond Road. ***This was addressed by CAR 2015-004. The investigation consisted of digging test pits in the area of concern. No trash/garbage/debris was found in close proximity to the installed pipe. The commissioning of the cathodic protection (CP) system and a direct assessment survey (to be conducted in the spring of 2016) will provide additional mitigation measures to address this concern.***

Depth of Cover (TAB 4)

Pipe installed in 2014 was found to have insufficient cover in several locations. ***This issue was addressed by CAR 2015-005. The lack of proper cover was addressed by a combination of regrading, pipe lowering by cutting out sections and permit amendments. (See the CAR for more specific information). Additionally, the final as-builts for this section of ANGP will be reviewed once complete to ensure proper depth of cover as specified in permits, specifications and agreements.***

Bending

A question was raised as to whether all bends were done as required. There is not clear evidence that bends were not done correctly so no CAR was issued. ***The inspection reports do not document any incorrect bends. The caliper tool run will locate any wrinkles, dents, buckles or ovality that could be a result of incorrect bends. If necessary a CAR will be issued at that time.***

Specification Deviations (TAB 5)

It was determined that not all trench breakers were installed as required. ***This is addressed by CAR 2015-006. The corrective actions for this continue are in progress and required trench breakers will be installed in the future (see CAR for more specific information). In the interim, VGS Operations will patrol the transmission corridor on a monthly bases, not to exceed 45 days, or after any significant rain event to ensure no erosion occurs due to the lack of a trench breaker.***

<u>2015 Items</u>

Welding (TAB 6)

A determination was made that the requirements for welding line-up clamps should be more restrictive than those in the qualified welding procedures. ***Directive 2015-004 was issued requiring the line-up clamps be used unless they meet specific requirements.***

Coatings (TAB 7)

The method of pipe surface preparation for shrink sleeves was clarified by directive. ***Directive 2015-010 was issued requiring sandblasting using the SSPC-SP10 or NACE 2 – Near-White Blast Cleaning Specification.***

Pritec patches were discovered to not be adhering appropriately to the Pritec pipe. ***CAR 2015-003 was issued. As a result of the investigation into the issue the decision was made to switch to the use of Canusa sleeves as the sole method of repair until such time as other methods may be approved. The commissioning of the cathodic protection (CP) system and a direct assessment survey (to be conducted in the spring of 2016) provide additional mitigation measures to address this concern.***

Sacrificial coatings were used over the coated welds on pipe installed by Horizontal Directional Drilling (HDD). ***Directive 2015-009 was issued to address correct installation of the additional sacrificial coating.***

The frequency of adhesion testing during winter months was addressed by increasing the frequency of those tests from October 1st through March 31st. ***Directive 2015-011 was issued.***

Trenching and Backfill (TAB 8)

Sand berms/pillows were used in some areas instead of sandbags for pipe support. ***CAR 2015-002 was issued. The use of sand berms was discontinued unless it is added to the technical specifications as an approved method of support and padding of the pipe.***

The technical specifications require the use of pipe supports in all locations unless otherwise directed by the Construction Management Team (CMT). The CMT determined that the use of pipe supports was unwarranted in the area from station 240+26 to 279+75 due to the uniform sandy condition of the trench. ***Directive 2015-005 was issued to document this direction.***

It was determined that compaction requirements in typical cross-county areas needed further clarification. ***Directive 2015-006 was issued to document this clarification.***

It was determined that the general backfill material specifications were overly restrictive. ***Directive 2015-007 was issued to change the maximum dimension for stones to clods in general backfill from 3" in the longest dimension to 6" in the longest dimension.***

Horizontal Directional Drilling (TAB 9)

The HDD installation under Route 2A and the railroad in Essex did not meet the acceptance criteria in place at the time it was installed. ***CAR 2015-008 was issued. The investigation included an indirect inspection of the pipe in question by EN Engineering. (See the CAR for more specific information). The results of the testing indicated that the pipe is acceptable. The commissioning of the cathodic protection (CP) system and a direct assessment survey (to be conducted in the spring of 2016) will provide additional mitigation measures to address this concern.***

Conclusion

VGS developed and implemented a robust Quality Assurance Plan for the Addison Natural Gas Project. The program highlighted actual and potential Condition Adverse to Quality (CAQ) that were remediated according to the Plan. With the increased investment in the QA/QC program, many potential quality issues were addressed by the use of Specification and Directives, rather than becoming conditions which required corrective actions .The commitment to quality is further evident by the fact that most issues in 2015 were addressed before they became a CAQ.

Additionally, VGS has accelerated planned mitigation measures, including the commissioning of the CP system at the time of gas-up, additional patrols and direct assessment surveys.

TAB 2

Vermont Gas

Welding Program

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Appendix C VGS Welding Document Numbering System

Appendix D VGS Welding Forms and Instructions
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  - Welding Procedure Specification (Branch Tee) Form D3
  - Welding Procedure Specification (Butt Weld) Form D4
  - Welding Procedure Specification (General) Form D5
  - VGS Welding Procedure Qualification Record Instructions D6
  - Welding Procedure Qualification Record Form D7
  - Issuing a VGS Weld Procedure Qualification Coupon Test Report D8
  - Weld Procedure Qualification Coupon Test Report Form D11
  - Issuing a VGS Welder Qualification Report D13
  - Welder Qualification Report Form D15
  - Welder Qualification Checklist D16
  - Welder Continuity Report D17

Section I. Administration of Plan

All pipeline welding at VGS shall be done in conformance with this program and API 1104 (Welding of Pipelines and Related Facilities) as incorporated by reference into 49 CFR Part 192.

This program does not cover welding done in accordance with section IX of the ASME Boiler and Pressure Vessel Code (BPVC).

The VGS Welding Program shall be reviewed periodically to ensure that all documents are relevant and current.

Section II. Abbreviations and Definitions

Codes and Compliance Administrator: Individual responsible for updating and posting welding program information in cooperation with the Welding Supervisor.

Coupon Test Report: Report showing destructive tests performed and the results thereof.

CPWI- Certified Pipeline Welding Inspector: CPWI™ is an individual who has completed the intense classroom training and testing by the National Welding Inspection School governing all of the codes and standards for pipeline construction and in-service welding.

CWI – Certified Welding Inspector: A person certified by AWS as meeting the qualification requirements of 5.2, 6.1, and 6.2 of AWS B5.1, Specification for the Qualification of Welding Inspectors.

PQR- Procedure Qualification Record: The WPS is supported by a number of documents (e.g., a record of how the weld was made, NDE, mechanical test results) which together comprise the Procedure Qualification Record. The PQR combines all of the information of the WPS and adds the test results to provide a complete document that certifies the WPS.

SMAW- Shielded Metal Arc Welding: A manual arc welding process that uses a consumable electrode coated in flux to lay the weld. An electric current, in the form of either alternating current or direct current from a welding power supply, is used to form an electric arc between the electrode and the metals to be joined. The work piece and the electrode melt forming the weld pool that cools to form a strong joint. As the weld is laid, the flux coating of the electrode disintegrates, giving off vapors that serve as a shielding gas and providing a layer of slag, both of which protect the weld area from atmospheric contamination.

VGS Welding Supervisor: Individual responsible for administering the VGS Welding Program. This is not necessarily a job title for purposes other than the administration of this program.

Welding Process: A materials joining process which produces coalescence of materials by heating them to suitable temperatures with or without the application of pressure or by the application of pressure alone and with or without the use of filler material. There are many types of welding processes. VGS uses the SMAW Process.

WPS- Welding Procedure Specification: A formal written document describing welding procedures, which provides direction to the welder for making sound and quality production welds as per the code requirements. The purpose of the document is to guide welders to the accepted procedures so that repeatable and trusted welding techniques are used.

WQR-Welder Qualification Report: Individual welders are certified with a qualification test documented in a Welder Qualification Report that shows they have the understanding and demonstrated ability to work within the specified WPS.

Section III. Welding Procedure Specifications

All welds must follow parameters in a WPS. If any changes are required new WPS must be created and tested in accordance with this section.

When a new welding procedure is required, it will be developed in accordance with API 1104 Section 5.3, using the VGS Welding Procedure Specification Form and the document Issuing a VGS Welding Procedure Specification (Appendix D).

All Welding Procedure Specifications must be supported by a Welding Procedure Qualification Record which demonstrates that welds with suitable mechanical properties and soundness can be made by the procedure. The method of conducting a Welding Procedure Qualification is detailed in Section IV.

Changes to a previously qualified WPS may be made and supported by the previous PQR unless any of the following essential variables are changed. In the case that an essential variable is changed, the procedure must be qualified according to Section IV.

WPS Essential Variables Requiring a New PQR

- Change in Welding Process
- Change in Base Material from one group to another
    - Group A – Specified minimum yield strength less than or equal to 42,000 psi.

    - Group B – Specified minimum yield strength greater than 42,000 psi but less than 65,000 psi.
    - Group C – Specified minimum yield strength greater than or equal to 65,000 psi. (Each grade in Group C requires a separate PQR.)
    - Note: Welding materials of two separate groups is allowed. The procedure for the higher strength group shall be used.
- Major change in Joint Design
    - Major changes include a change from V groove to U groove.
    - Minor changes which do not constitute an essential variable include changes in the angle of bevel or the land of the welding groove.
- Change in Position from fixed to roll or vice versa.
- Change in Wall Thickness Group
    - Nominal pipe wall thickness less than 0.188 in.
    - Nominal pipe wall thickness from 0.188 in. through 0.750 in.
    - Nominal pipe wall thickness greater than 0.750 in.
- Changes in Filler Metal (Refer to Appendix B)
    - Change from one filler metal group to another
    - For Group C Materials, a change in the AWS designation of the filler material
- Change in Electrical Characteristics
    - Change from Electrode Negative to Electrode Positive or vice versa.
    - Change in current from DC to AC or vice versa.
- Increase in the maximum time between completion of the root bead and the start of the second bead.
- Change in the Direction of Welding from Uphill to Downhill or vice versa.
- Change in flux
- Change in the range for Speed of Travel
- Decrease in the specified minimum preheat temperature
- The addition of or change to Post Weld Heat Treatment Specifications

If there is no essential variable change requiring a procedure qualification, the signed WPS will be forwarded to the VGS Welding Supervisor or Codes and Compliance Administrator for issuing and posting in accordance with Section VI of this plan.

If a procedure qualification is required for a new WPS (including changes to a current WPS that include changes in essential variables, the draft WPS will be tested in accordance with Section IV of this plan.

Section IV. Procedure Qualifications

Procedure qualification involves making a procedure qualification weld and testing that weld.

When the procedure qualification weld is made, both the welder and the tester must have a copy of the draft WPS readily available for reference. The tester shall be a CWI, a CPWI or an individual qualified by appropriate training and experience and approved by the VGS Welding Supervisor. If the tester is not a VGS employee, a company representative must witness the welding and testing.

The actual welding parameters are checked and recorded at the time of welding, by the tester, to ensure the WPS is being followed. These may be recorded directly onto the VGS Weld Procedure Qualification Coupon Test Report (Appendix D) or transferred to it after being recorded elsewhere during the actual test.

Supporting documentation, such as material test reports and inspector's notes should become part of the PQR.

All testing both non-destructive and destructive, is recorded on the VGS Weld Procedure Qualification Coupon Test Report. Required tests are detailed in API 1104 Sections 5.6 and 5.8.

Once all the parameters and test results are recorded on the VGS Weld Procedure Qualification Coupon Test Report the tester shall determine, based on the test results, if the procedure is qualified, qualified with changes to the draft or disqualified and so indicate on the test report. The report shall then be signed by the tester. If the tester is not a VGS employee, the company representative witnessing the welding and testing must also sign the test report. Once signed, no changes may be made to any VGS Weld Procedure Qualification Coupon Test Report.

The VGS Weld Procedure Qualification Coupon Test Report and any additional documentation shall then be forwarded to the VGS Welding Supervisor or the VGS Codes and Compliance Administrator.

Section V. Welder Qualifications

The primary purpose for Welder Qualification is to verify the ability of an individual to execute a qualified welding procedure specification to produce a sound weld. Welders qualify to a specific welding process (i.e. SMAW), not a specific welding procedure.

There are three types of welder qualification covered by this welding plan: Single Qualification, Multiple Qualification and Requalification.

Single Qualification: A welder shall make a test weld using a qualified procedure to make a butt weld in the fixed position (per API 1104 Section 6.2.1). A welder qualified with a single qualification test shall be qualified to make butt welds within the limits of the essential variables listed below. If any of these variables change the welder must requalify.

- Change in Welding Process
- Change in the Direction of Welding from Uphill to Downhill or vice versa.
- Change in Filler Metal (Refer to Appendix B)
    - From Group 1 or 2 to Group 3
    - From Group 3 to Group 1 or 2
- Change for one outside diameter group to another
    - Outside diameter less than 2.375 in.
    - Outside diameter from 2.375 in. through 12.750 in.
    - Outside diameter greater than 12.750 in.
- Change in Wall Thickness Group
    - Nominal pipe wall thickness less than 0.188 in.
    - Nominal pipe wall thickness from 0.188 in. through 0.750 in.
    - Nominal pipe wall thickness greater than 0.750 in.
- Change in Position
    - From vertical to horizontal or vice versa
    - Note: Passing a butt weld qualification test in the fixed position with the axis inclined 45° from the horizontal plane shall be qualified to do butt welds and lap fillet welds in all positions
- Change in Joint Design

Multiple Qualification: A welder who completes the butt weld qualification test on pipe with an outside diameter greater than or equal to 12.750 in. and a full-size branch connection weld on pipe with an outside diameter greater than or equal to 12.750 in. shall be qualified to weld in all positions; on all wall thicknesses, joint designs and fittings; and on all pipe diameters.

A welder who completes the butt weld qualification test on pipe with an outside diameter less than 12.750 in. and a full-size branch connection weld on pipe with an outside diameter less than 12.750 in. shall be qualified to weld in all positions; on all wall thicknesses, joint designs and fittings; and on all pipe diameters less than or equal to the outside diameter used by the welder in the qualification tests.

To perform a multiple qualification the welder shall make two test welds using qualified procedures.

For the first test, the welder shall make a butt weld in the fixed position with the axis of the pipe either in the horizontal plane or inclined from the horizontal plane at an angle of not more than 45°. This weld shall be made on pipe with an outside diameter of at least 6.625 in. and with a wall thickness of at least 0.250 in. without a backing strip.

For the second test, the welder shall lay out, cut, fit and weld a full-sized branch-on-pipe connection. This weld shall be made on pipe with an outside diameter of at least 6.625 in. and with a wall thickness of at least 0.250 in. A full size hole shall be cut in the run. The weld shall be made with the run-pipe axis in the horizontal position and the branch-pipe extending vertically downward from the run.

If any of the following essential variables are changed, the welder must requalify:

- Change in Welding Process
- Change in the Direction of Welding from Uphill to Downhill or vice versa.
- Change in Filler Metal (Refer to Appendix A)
  - From Group 1 or 2 to Group 3
  - From Group 3 to Group 1 or 2

Requalification: A welder may not weld on pipe unless within the preceding 6 calendar months the welder has had at least one production weld tested and found acceptable under section 6 of API 1104. Alternatively, a welder may maintain qualification status by performing welds tested and found acceptable under section 6 of API 1104 at least twice each calendar year, but at intervals not exceeding 7 ½ months.

If there is a specific reason to question a welder's ability to make welds that meet the specifications s/he shall perform a requalification test.

To complete the requalification test a welder shall make a test weld using a qualified procedure to make a butt weld in the fixed position.

The Welder Continuity Report shall be used to document compliance with this section of the Welding Program.

Welder Qualification Tests

For all types of welder qualification tests, both the welder and the tester must have a copy of the WPS readily available for reference. The tester shall be a CWI, a CPWI or an individual qualified by appropriate training and experience and approved by the VGS Welding Supervisor. If the tester is not a VGS employee, a company representative must witness the welding and testing.

Prior to starting the welder qualification test(s), the welder shall be allowed reasonable time to adjust the welding equipment to be used. The welder must follow the WPS and shall use the same welding technique and proceed with the same speed s/he will use if s/he passes the test and is permitted to do production welding.

During welder qualification test(s) the following shall be verified by the tester and conformance or non-conformance to the parameters will be noted on the Welder Qualification Checklists.

1. Preheat
2. Pipe end damage and cleanliness
3. Proper space and alignment
4. Electrode classification, condition and diameter
5. Correct polarity
6. Proper ground connection
7. Amperage, voltage and travel speed
8. Clamp release at proper time
9. Visually inspect root pass for cracks, burn-through, etc.
10. Welder identification

During the welding test(s), the tester shall record the following parameters. These may be recorded directly onto the VGS Welder Qualification Report (Appendix D) or transferred to it after being recorded elsewhere during the actual test.

- Pipe Outside Diameter
- AWS Class
- Direction of Travel

The tester shall visually examine all test welds. For a qualification test weld to be acceptable it shall be free from cracks, inadequate penetration and burn-through, and must present a neat workman-like appearance. The depth of undercutting adjacent to the final bead on the outside of the pipe shall not be more than 1/32 in. or 12.5% of the pipe wall thickness, whichever is smaller, and there shall not be more than 2 in. of undercutting in any continuous 12 in. length of weld.

The tester shall examine test weld to ensure that they are acceptable according the requirements set forth in API 1104 Section 6.2.1 (Single Qualification and Requalification) or Section 6.3.1 (Multiple Qualification).

All testing (visual, destructive and non-destructive [optional]) shall be recorded on the VGS Welder Qualification Report in accordance with the instruction document Issuing a VGS Welder Qualification Report (Appendix D).

Once the parameters and test results are recorded on the VGS Welder Qualification Report, the tester shall determine, based on the test results and the Welder Qualification Checklist, if the welder is qualified or disqualified and so indicate on the test report. The report shall then be signed by the tester. If the tester is not a VGS employee, the company representative witnessing the welding and testing must also sign the test report.

The VGS Welder Qualification Test Report, the Welder Qualification Checklist and any additional documentation shall then be forwarded to the VGS Welding Supervisor or the VGS Codes and Compliance Administrator.

Section VI. Recordkeeping

When any completed document/form is received by the VGS Welding Supervisor or the VGS Codes and Compliance Administrator, s/he will check if for completeness and accuracy. If there are any discrepancies on the document/form, it will be returned for clarification.

Completed forms will be scanned and placed in an appropriate folder on the VGS shared drive. This folder will be set up in a manner that will allow all VGS employees access to the information (see specific information below). Access for any purpose other than viewing and printing will be limited to the VGS Welding Supervisor, the VGS Codes and Compliance Administrator and the IT Department.

The following folders will be maintained on the VGS Shared Drive:

Welding Procedure Specifications: All current, qualified procedures will be maintained in this folder. Everyone will have view/print access. Any and all production welding shall be performed using a WPS from this folder.

Procedure Qualification Records: A PQR supporting each WPS in the above folder will be maintained in this folder. Everyone will have view/print access.

Qualified Welders: A list of all currently qualified welders will be maintained in this folder. Additionally this folder will contain the most recent qualification test for each qualified welder. Everyone will have view/print access.

Welder Qualification Records: Historical WQR records will be maintained in this folder. This folder will have access restricted to the VGS Welding Supervisor, the VGS Codes and Compliance Administrator and the IT Department.

Retired Welding Procedure Specification and Procedure Qualification Records: Historical WPS and PQR records will be maintained in this folder. This folder will have access restricted to the VGS Welding Supervisor, the VGS Codes and Compliance Administrator and the IT Department.

Section VII. Production Welding

All production welding must be done in accordance with a qualified Welding Procedure Specification. A copy of the relevant Welding Procedure Specifications will be issued to the welder to reference during any welding operations. The welder will verify through appropriate document control procedures that the WPS is current.

During production welding, the following shall be verified during the first weld of the day and at least once more during the day if additional production welds are performed.

11. Preheat
12. Pipe end damage and cleanliness
13. Proper space and alignment
14. Electrode classification, condition and diameter
15. Correct polarity
16. Proper ground connection
17. Amperage, voltage and travel speed
18. Clamp release at proper time
19. Visually inspect root pass for cracks, burn-through, etc.
20. Welder identification

APPENDIX A
REVISION LOG

	Revision 1 **Date 06/12/2015**
Miscellaneous	Minor changes for clarity or grammar which do not effect procedures
Section IV	Added language disallowing changes to any signed Procedure Qualification Test Record
Appendix A	Added Revision Log
Appendix B	Appendix A was renamed Appendix B
Appendix C	VGS Welding Document Numbering System was removed from Appendix D and is now Appendix C
Appendix D	Appendix B was renamed Appendix D
Appendix D Issuing a VGS WPS	Added language requiring WPS to include all electrode diameters that may be used; Added language requiring that any changes found necessary to a draft WPS during testing be made prior to the WPS being signed and issued.
Appendix D Weld Procedure Coupon Test Report	Modified form to include enough samples for testing procedures on large diameter pipe.
Appendix D	Removed Weld Procedure Qualification Checklist as it is not a required document, rather a note taking aid.
Appendix D Welder Qualification Report	Modified form to remove calculations for tensile test, as they are not required for welder qualification. Added enough samples for testing welders on large diameter pipe.

	Revision 2 **Date 07/27/2015**
Miscellaneous	Minor changes for clarity or grammar which do not effect procedures
Title	Retitled document
Section II	Added definitions for CPWI and CWI
Section III	Added language requiring all weld follow WPS parameters
Section IV	Removed references to Weld Procedure Qualification Checklist which was removed from Appendix D in Revision 1
Section IV and Appendix D VGS Weld Procedure Qualification Coupon Test Instruction and Report	Added "qualified with changes to the draft" to options for completing VGS Weld Procedure Qualification Coupon Test Report
Section V	Added language specifically requiring that WPS be followed during qualification testing.
Section V	Changed required parameter from "Rod Diameter" to "Pipe Outside Diameter" to correct previous error
Appendix D	Added language in reference to Preheat section in WPS forms to define allowable methods and controls.

	Revision 3 **Date 08/03/2015**
Section I	Added language specifying that this plan does not cover ASME welding
Section VII	Added section on production welding
Title	Reverted to original title

APPENDIX A
REVISION LOG

Revision 4	**Date 08/05/2015**
Section V	Modified Welder Qualification Tests subsection to include Welder Qualification Checklist
Appendix D	Added Welder Qualification Checklist

Revision 5	**Date 08/17/2015**
Section V	Modified Requalification language and clarified requirements
Appendix D	Added Welder Continuity Record

Revision 6	**Date XX/XX/XX**

Revision 7	**Date XX/XX/XX**

Revision 8	**Date XX/XX/XX**

Appendix B

Table 1—Filler Metal Groups

Group	AWS Specification	AWS Classification Electrode	Flux [c]
1	A5.1	E6010, E6011	
	A5.5	E7010, E7011	
2	A5.5	E8010, E8011, E9010	
3	A5.1 or A5.5	E7015, E7016, E7018	
	A5.5	E8015, E8016, E8018	
		E9018	
4 [a]	A5.17	EL8	P6XZ
		EL8K	F6X0
		EL12	F6X2
		EM5K	F7XZ
		EM12K	F7X0
		EM13K	F7X2
		EM15K	
5 [b]	A5.18	ER70S-2	
	A5.18	ER70S-6	
	A5.28	ER80S-D2	
	A5.28	ER90S-G	
6	A5.2	RG60, RG65	
7	A5.20	E61T-GS [d]	
		E71T-GS [d]	
8	A5.29	E71T8-K6	
9	A5.29	E91T8-G	

NOTE Other electrodes, filler metals, and fluxes may be used but require separate procedure qualification.

[a] Any combination of flux and electrode in Group 4 may be used to qualify a procedure. The combination is identified by its complete AWS classification number, such as F7A0-EL12 or F6A2-EM12K. Only substitutions that result in the same AWS classification number are permitted without requalification.

[b] A shielding gas (see 5.4.2.10) is required for use with the electrodes in Group 5.

[c] In the flux designation, the X can be either an A or P for as-welded or postweld heat treated.

[d] For root pass welding only.

APPENDIX C

VGS Welding Document Numbering System

WPS -VGS-X65-1:2014-1

Type of document: WPS – Welding Procedure Specification
PQR – Procedure Qualification Record
WQR – Welder Qualification Record

WPS-VGS-X65-1:2014-1

Vermont Gas Systems

WPS-VGS-X65-1:2014-1

Type of material

WPS-VGS-X65-1:2014-1

Procedure number: 1 – Branch
2 – Butt
3 - Delay
Additional numbers to be assigned as needed

WPS-VGS-X65-1:2014-1

Year and version. The year of issue and the version. Additional versions of a WPS may be issued based on one PQR.

The revision number shall be shown in the lower left hand corner of the document. This should not be confused with the version number. A revision would be a change to a specific version. All documents shall be issued initially as Revision 0.

Weld Procedure Qualification Coupon Test Report

Test/Report Number shall be the six digit date, followed by a dash and a number indicating the number of the test on that day. i.e. 040815-1, 040815-2, etc.

Appendix D

Issuing a VGS Welding Procedure Specification

1. Title the WPS to make it clear what the specification covers. There is no specific convention for naming, as the numbering system will be the method of document control.

2. Assign WPS number based on the VGS Welding Document Number System (Appendix C).

3. If WPS is being issued based on a previously performed Procedure Qualification Record, fill in the Supporting Procedure Qualification Record Number.

   If WPS is being issued pending Procedure Qualification testing, note "Pending Qualification" in place of a supporting Qualification Record Number.

4. Fill out welding information on the WPS form as follows:

   - Select type of shielding
     - Flux – Cellulose
     - Flux – Iron Powder
   - Select Pipe Material Type
     - Group A – Specified minimum yield strength less than or equal to 42,000 psi.
     - Group B – Specified minimum yield strength greater than 42,000 psi but less than 65,000 psi.
     - Group C – Specified minimum yield strength greater than or equal to 65,000 psi. Each grade of group C materials requires a separate qualification test. For Group C materials specify the grade.
   - Select Pipe Diameter range
   - Select Wall Thickness range
   - Select Filler Metal Group(s)
     - Select all filler metal groups to be used in this procedure. Specify designations within each group.
   - Specify Preheat instructions. If no preheat is required this must be noted.
   - Specify Postheat instructions. If no postheat is required this must be noted.
   - Sketch joint design if not using a form prepopulated with sketch.
   - For bead 1, 2 and 3+ specify the following paremeters:
     - Specify Electrode size (enter all diameters that may be used)
     - Specify Electrode designation
     - Specify Voltage Range

    - Specify Amperage Range
    - Select AC or DC Current
    - Select Electrode Positive or Electrode Negative Polarity
    - Select Uphill or Downhill Direction of Travel
    - Specify Travel Speed Range
- Specify allowable time lapses.
    - Bead 1 to Bead 2
    - Bead 2 to each subsequent Bead
- Select Line Up Clamps specifications. (If clamp is allowed but not required "Not Required" should be checked, along with allowable clamp type.)
- Select allowable tools for cleaning and grinding.

5. If WPS is being issued pending Procedure Qualification testing, the procedure should not be signed. It should be issued clearly marked "DRAFT" (either by ink stamp or water mark). The WPS will then be tested. If required, changes to the draft WPS shall be updated with any changes found to be necessary during testing and then issued per the VGS Welding Procedure Qualification document. The WPS shall then be signed and dated by the preparer and forwarded to an Operations Supervisor or Manager for review and approval.

   If WPS is being issued based on a previously performed Procedure Qualification Record the Preparer should sign and date the WPS and forward to an Operation Supervisor or Manager for review and approval.

6. Once the WPS has been reviewed and approved, forward it to the VGS Welding Supervisor or Codes and Compliance Administrator for issuing and posting.

WELDING PROCEDURE SPECIFICATION

Vermont Gas

TITLE

WPS #

Supporting Procedure Qualification Record:

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding:

Pipe Material Description: ☐ Group A ☐ Group B ☐ Group C : Specify

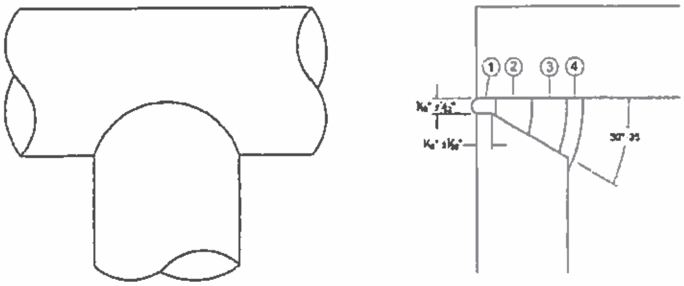
Diameter: ☐ OD < 2.375 Inches ☐ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☐ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☐ Group 1 ☐ Group 2 ☐ Group 3

Preheat: Flame heat; Monitor using temperature crayons, pyrometer or infrared thermometer

Postheat: Flame heat; Monitor using temperature crayons, pyrometer or infrared thermometer



NOT TO SCALE

Bead #	Electrode Size	Electrode Designation	Voltage Range	Current Amperage Range	Current AC/DC	Polarity	Direction of Travel	Travel Speed
1								IPM
2								IPM
3+								IPM

Time Lapse Bead 1 to Bead 2: Bead 2 to each succeeding bead:

Line Up Clamp: ☐ Internal ☐ External ☐ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☐ Power Tools ☐ Hand Tools

repared by: Date/Time Field

Approved by: Date/Time Field

Rev. 1 07/29/15

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE

WPS #

Supporting Procedure Qualification Record:

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding:

Pipe Material Description: ☐ Group A ☐ Group B ☐ Group C : Specify

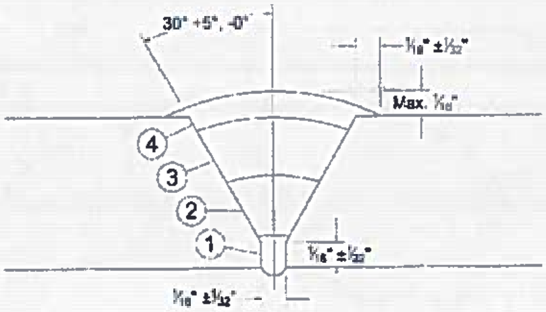
Diameter: ☐ OD < 2.375 Inches ☐ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☐ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☐ Group 1 ☐ Group 2 ☐ Group 3

Preheat: Flame heat; Monitor using temperature crayons, pyrometer or infrared thermometer

Postheat: Flame heat; Monitor using temperature crayons, pyrometer or infrared thermometer



NOT TO SCALE

Bead #	Electrode		Voltage Range	Current		Polarity	Direction of Travel	Travel Speed
	Size	Designation		Amperage Range	AC/DC			
1								IPM
2								IPM
3+								IPM

Time Lapse Bead 1 to Bead 2: Bead 2 to each succeeding bead:

Line Up Clamp: ☐ Internal ☐ External ☐ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☐ Power Tools ☐ Hand Tools

Prepared by: Date/Time Field

Approved by: Date/Time Field

Rev. 1 07/29/15

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE

WPS #

Supporting Procedure Qualification Record:

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding:

Pipe Material Description: ☐ Group A ☐ Group B ☐ Group C : Specify

Diameter: ☐ OD < 2.375 Inches ☐ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☐ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☐ Group 1 ☐ Group 2 ☐ Group 3

Preheat: Flame heat; Monitor using temperature crayons, pyrometer or infrared thermometer

Postheat: Flame heat; Monitor using temperature crayons, pyrometer or infrared thermometer

Bead #	Electrode		Voltage Range	Current		Polarity	Direction of Travel	Travel Speed
	Size	Designation		Amperage Range	AC/DC			
1								IPM
2								IPM
3+								IPM

Time Lapse Bead 1 to Bead 2: Bead 2 to each succeeding bead:

Line Up Clamp: ☐ Internal ☐ External ☐ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☐ Power Tools ☐ Hand Tools

Prepared by: Date/Time Field

Approved by: Date/Time Field

Rev. 1 07/29/15

Page 1 of 1

VGS Welding Procedure Qualification Record Instructions

1. Enter title of Welding Procedure Specification to be qualified.
2. Assign PQR number based on the VGS Welding Document Number System.
3. Enter the Welder(s) name(s).
4. Enter qualification date(s).
5. Attach the following documents:
   - Draft WPS (Enter number on cover sheet)
   - Procedure Qualification Test Report (Enter number on cover sheet)
   - Final WPS as issued (signed) (Enter number on cover sheet)
6. Check the following documents if available and attach to cover sheet:
   - Inspector's Notes
   - Radiographic Inspection Report
   - Material Test Report
7. Preparer should sign and date the WPS and forward to an Operations Supervisor or Manager for review and approval.
8. Once the PQR has been reviewed and approved, forward it to the VGS Welding Supervisor or Codes and Compliance Administrator for issuing and posting.
9. Information on attaching additional WPS(s) to the Welding Procedure Qualification Record is included in Issuing and Posting VGS Welding Documents procedure.

Vermont Gas

WELDING PROCEDURE QUALIFICATION RECORD

TITLE

PQR#

In accordance with API 1104

Weldor

Date

Required Attachments

Draft WPS Number

Procedure Qualification Test Report #:

Final WPS as issued (signed)

Additional Attachments

(if available)

- ☐ Inspector's Notes
- ☐ Procedure Qualification Checklist
- ☐ Radiographic Inspection Report
- ☐ Material Test Report

Prepared by: Date/Time Field

Approved by: Date/Time Field

Changes other than essential variables listed in API 1104 5.4.2 may be made in the procedure without the need for requalification. Any procedures issued without the need for requalification based on this Procedure Qualification Record must be listed below and attached to this file.

Final WPS as issued (signed) Date

Final WPS as issued (signed) Date

Final WPS as issued (signed) Date

Final WPS as issued (signed) Date

Final WPS as issued (signed) Date

Rev. 0 04/08/15

Issuing a VGS Weld Procedure Qualification Coupon Test Report

1. Enter WPS number from the draft WPS being qualified.
2. For Test/Report Number, enter six digit date, followed by a dash and a number indicating the number of the test on that day. i.e. 040815-1, 040815-2, etc.
3. Enter date of coupon test.
4. Enter Welder's name.
5. Enter last 4 digits of welder's Social Security Number.
6. Enter welder's stencil information. If not available, stencil will be last 4 digits of welder's SSN.
7. Enter Contractor employing welder. If VGS employee, so state.
8. Enter project name if applicable. Enter N/A if qualification if not related to a specific project.
9. Enter location of test.
10. Enter weather information.
11. Enter Pipe Material Description.
12. Enter Electrical Characteristics.
13. Enter Pipe Diameter.
14. Enter Welding Machine information.
15. Enter Pipe Wall Thickness
16. Enter Preheat temperature observed. If no preheat used, enter N/A.
17. Enter Pipe Manufacturer.
18. Select Direction of Travel: Uphill, Downhill or Combination. If "Combination" is selected, enter direction for each pass in the "Notes" section below.
19. Enter Pipe Heat Number.
20. Select number of welders.
21. Enter Joint Design description.
22. Select methods of Cleaning/Grinding observed.

23. Select filler metals observed being used on root and subsequent passes.

24. Enter welding position observed.

25. Select shielding type observed being used.

26. Enter lapse time observed between passes 1 and 2, and between subsequent passes.

27. Enter information on how welder's identification was verified. (i.e. Driver's License, Passport)

28. Enter total weld time.

29. Enter Interpass Temperature observed.

30. Enter Postheat temperature observed. If no postheat used, enter N/A.

31. Enter following information as observed during the test weld:

- Weld Pass
- Electrode Type
- Rod Diameter
- Preheat Temperature
- Voltage Range
- Amperage Range
- Travel Speed
- Start and Stop times for each pass

Note: One method of measuring the travel speed that may be used is to begin timing the welding process when the welder initiates the arc and stop when the weld pass is terminated. Determine how much time elapsed along with the total length of filler metal deposited. Divide the length of filler metal in inches by the elapsed time in seconds. Multiply by 60 to determine the travel time in inches per minutes.

32. Enter following test information as required by API 1104 Section 5.6 and 5.8:

- Bend Tests
- Nick Break Tests
- Tensile Tests

33. Select whether weld was destructively tested, examined by radiography, or both. If examined by radiography, attach copy of radiography report.

34. Select whether procedure was Qualified, Qualified with Changes or Disqualified. If Qualified with Changes, note any changes made to the Draft WPS.

35. If qualified, select the qualification limitations for the test based on API 1104.

36. **Person conducting the test shall sign and date form. If person conducting the test is not a VGS employee, test must be observed and signed by a company representative.**

37. **Attach Weld Procedure Qualification Coupon Test Report to Welding Procedure Qualification Record. Submit as directed in VGS Welding Procedure Qualification Instructions.**

Weld Procedure Qualification Coupon Test Report

Vermont Gas

Welding Procedure number:

Test/Report No:

Date:

Welder:

Social Security Number: XXX-XX-

Welder Stencil:

Contractor:		**Project:**	
Location:		**Weather:**	
Welding Process:	Manual SMAW	**Pipe Material Description:**	
Electrical Characteristics:		**Pipe Diameter:**	
Welding Machine:		**Wall Thickness:**	
Preheat Temperature:		**Pipe Manufacturer:**	
Direction of Travel		**Heat Number:**	
Number of Welders:	○ 1 ○ 2	**Joint Design:**	
Method of Cleaning:	☐ Hand Tools ☐ Power Tools	**Filler Metal:**	Root Subsequent
Position:		**Shielding:**	
Time Between Passes:	1-2 Subsequent	**Welder Identification Verified:**	
Total Weld Time:		**Interpass Temperature:**	
Post Weld Heat Treatment:		**Notes:**	

WELD PASS	ELECTRODE	ROD DIAMETER	PREHEAT	VOLTAGE RANGE	AMPERAGE RANGE	TRAVEL SPEED (inches per min.)	Start / Stop
			°F	/	/	IPM	/
			°F	/	/	IPM	/
			°F	/	/	IPM	/
			°F	/	/	IPM	/
			°F	/	/	IPM	/
			°F	/	/	IPM	/
			°F	/	/	IPM	/

Notes:

Weld Procedure Qualification Coupon Test Report

	Bend Tests			Nick Break Tests		Additional Nick Break in lieu of Tensil	
Face 1		Root 1		Nick 1		Nick 5	
Face 2		Root 2		Nick 2		Nick 6	
Face 3		Root 3		Nick 3		Nick 7	
Face 4		Root 4		Nick 4		Nick 8	

	Tensile 1	Tensile 2	Tensile 3	Tensile 4
Dimensions				
Area				
Max Load				
Tensile Strength				
Fracture Location				
Disposition				

☐ Destructively Tested ☐ Examined by Radiography (not required); If performed, attach copy of Radiography Report.

☐ Qualified ☐ Qualified with Changes (see notes below) ☐ Disqualified

Note any Changes to Draft WPS:

Qualification Limitations for this Test	Diameter:	☐ < 2.375" O.D.	☐ 2.375" - 12.75" O.D.	☐ >12.75" O.D.
	Wall Thickness:	☐ < .188" W.T.	☐ .188" - .750" W.T.	☐ > .750" W.T.

I/We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of API 1104 (latest edition adopted by 49 CFR 192).

Tested by: Date:

Company Representative: Date:
(Required if tested by other than Company personnel)

Issuing a VGS Welder Qualification Test Report

1. Enter Welder's name.
2. Enter Welder's employer.
3. Enter location of test.
4. Enter date of test.
5. Select type of qualification:
    - Single (Butt Weld only)
    - Multiple (Butt and Branch Welds)
    - Requalification (Butt Weld Only)
6. Select Butt Weld Test or Low Hydrogen Sleeve (groove weld) Test
7. Enter Number for WPS being used.
8. Enter pipe information:
    - Pipe specification and grade
    - Pipe diameter
    - Pipe wall thickness
9. Enter following information as observed during the test weld:
    - Rod Diameter
    - Electrode AWS Class
    - Direction of travel
10. Enter following test information as required by API 1104 Section 5.6:
    - Bend Tests
    - Nick Break Tests
    - Tensile Tests
11. Select whether visual inspection is Acceptable or Unacceptable
12. Select Weld Test or Low Hydrogen Sleeve (fillet weld) Test if multiple qualification was selected above. If Single qualification or Requalification was selected proceed to step 18.

13. Enter Number for WPS being used.

14. Enter pipe information:

    - Pipe specification and grade
    - Pipe diameter
    - Pipe wall thickness

15. Enter following information as observed during the test weld:

    - Rod Diameter
    - Electrode AWS Class
    - Direction of travel

16. Enter the Nick Break Test information as required by API 1104 Section 5.8.

17. Select whether visual inspection is Acceptable or Unacceptable

18. Select whether radiographic inspection was used during the test and whether it was acceptable or unacceptable.

19. Person conducting the test shall sign and date form. If person conducting the test is not a VGS employee, test must be observed and signed by a company representative.

20. Forward completed form to the VGS Welding Supervisor or Codes and Compliance Administrator for recordkeeping.

Vermont Gas

WELDER QUALIFICATION REPORT

In accordance with API 1104

Welder Name: Employer

Test Location Date

Qualification Type: ○ Single (Butt Weld Only) ○ Multiple (Butt and Branch Welds) ○ Requalification (Butt Weld Only)

○ Butt Weld Test ○ Low Hydrogen Sleeve (groove weld) Test WPS #

Process: SMAW Joint Design: V-Bevel Position: Fixed

Pipe Spec/Grade: Pipe Diameter: Pipe Wall Thickness:

Pass	Rod Diameter	AWS Class	Direction of Travel
Root Pass			
Hot Pass			
Filler Pass(es)			
Cap Pass(es)			

Nick Break Tests

Nick 1

Nick 2

Nick 3

Nick 4

Bend Tests

Face 1		Face 3		Root 1		Root 3	
ce 2		Face 4		Root 2		Root 4	

	Tensile 1	Tensile 2	Tensile 3	Tensile 4
Fracture Location				
Disposition				

Additional Nick Break in lieu of Tensile

Nick 5

Nick 6

Nick 7

Nick 8

Visual:

○ Branch Weld test ○ Low Hydrogen Sleeve ((fillet weld) Test WPS #

Process: SMAW Joint Design: V-Bevel Position: Fixed

Pipe Spec/Grade: Pipe Diameter: Pipe Wall Thickness::

Pass	Rod Diameter	AWS Class	Direction of Travel
Root Pass			
Hot Pass			
Filler Pass(es)			
Cap Pass(es)			

Nick Break Tests

Nick 1

Nick 2

Nick 3

Nick 4

Visual:

Was optional radiographic inspection performed? ○ No ○ Yes - Acceptable ○ Yes - Unacceptable
If yes, attach copy of radiography report.

Test Result: ○ **Qualified** ○ **Disqualified**

Tested by: Date:

Company Representative
(Required if tested by other than Company

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WELDER QUALIFICATION CHECKLIST
(For use conjunction with the Welder Qualification Test Report)

Date: ________________________ Welder: ________________________

WPS #: ________________________ ID Verified Via: ________________________

ELEMENT	WITHIN WPS PARAMETERS	OUTSIDE WPS PARAMETERS
Preheat		
Proper Space and Alignment		
Electrode Classification and Diameter		
Polarity		
Amperage, Voltage and Travel Speed		
Clamp Release at Proper Time*		

*If no clamp is used enter N/A in the Within WPS Parameters column.

ELEMENT	ACCEPTABLE	UNACCEPTABLE
Pipe End Damage and Cleanliness		
Proper Ground Connection		
Visual Inspection of Root Pass for Cracks, Burn-through, etc.		

Each element shall be checked during welder qualification testing. Any mark in the "Outside WPS Parameters" or "Unacceptable" columns will cause a failure of the qualification test.

Tested by: ________________________ Date: ________________________

Vermont Gas

WELDER CONTINUITY REPORT

In accordance with 49 CFR 192.229

Welder Name: Employer

Stencil: Last 4 SSN: Qualification/Continuity Due Date:

A welder may not weld on pipe unless within the preceding 6 calendar months the welder has had at least one production weld tested and found acceptable under section 6 of API Standard 1104.

Alternatively, a welder may maintain an ongoing qualification status by performing welds tested and found acceptable under section 6 of API Standard 1104, at least twice each calendar year, but at intervals not exceeding 7 1/2 months.

This forms serves to document the compliance to these requirements.

☐ Welder has had a production weld tested and found acceptable within the last 6 calendar months

Date of Acceptable NDE Report: Attach NDE report referencing above stencil number.

☐ Welder has performed a test weld which was found acceptable

Date of Acceptable Test Weld: Attach Welder Qualification Report referencing above stencil number.

New Qualification/Continuity Date:

(New date is calculated as 6 months from the date of the Welder Qualification Test Report or the NDE Report.)

Approved By: Date:

Company Representative
quired if approved by other than Company personnel):

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE: X-65 Butt Weld

WPS #: WPS-VGS-X65-2:2014-2

Supporting Procedure Qualification Record: PQR-VGS-X65-2:2014-2

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding: Flux-Cellulose

Pipe Material Description: ☐ Group A ☐ Group B ☒ Group C : Specify APL 5L X-65

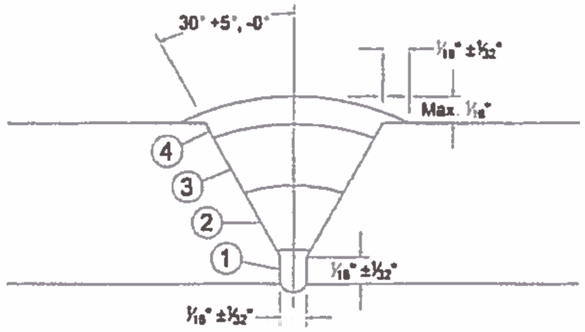
Diameter: ☐ OD < 2.375 Inches ☒ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☒ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☒ Group 1 A5.1 E6010 ☒ Group 2 A5.5 E8010 ☐ Group 3

Preheat: Flame heat to minimum 250°F (to minimum 300°F if ambient below 40°F), maximum 500°F. Check temperatures with temperature crayons or pyrometer.

Postheat: N/A



NOT TO SCALE

Bead #	Electrode		Voltage Range	Current		Polarity	Direction of Travel	Travel Speed	
	Size	Designation		Amperage Range	AC/DC				
1	1/8", 5/32"	A5.1 6010	15-30	75-135, 100-175	DC	Electrode Positive	Downhill	6-16	IPM
2	5/32", 3/16"	A5.5 8010	20-32	100-165,130-210	DC	Electrode Positive	Downhill	6-16	IPM
3+	5/32", 3/16"	A5.5 8010	20-32	100-165,130-210	DC	Electrode Positive	Downhill	6-16	IPM

Time Lapse Bead 1 to Bead 2: 5 minutes Bead 2 to each succeeding bead: 10 minutes

Line Up Clamp: ☐ Internal ☒ External ☒ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☒ Power Tools ☒ Hand Tools

Prepared by: Date/Time Field: Dec 5, 2014

Approved by: Date/Time Field: Dec 5, 2014

Rev. 0 04/08/15

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE X-65 BRANCH TEE

WPS # WPS-VGS-X65-1: 2014-3

Supporting Procedure Qualification Record: PQR-VGS-X65-1: 2014-2

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding: Flux-Cellulose

Pipe Material Description: ☐ Group A ☐ Group B ☒ Group C : Specify API 5L X-65

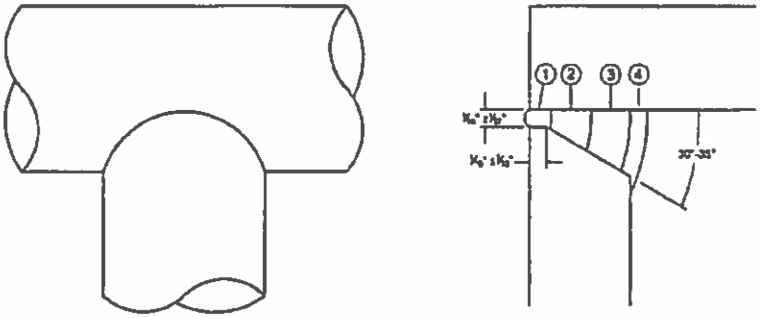
Diameter: ☐ OD < 2.375 Inches ☒ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☒ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☒ Group 1 A5.1 E6010 ☒ Group 2 A5.5 E8010 ☐ Group 3

Preheat: Flame heat to minimum 250°F (to minimum 300°F if ambient below 40°F), maximum 500°F.
Check temperatures with terperature crayons or pyrometer

Postheat: N/A



NOT TO SCALE

Bead #	Electrode		Voltage Range	Current		Polarity	Direction of Travel	Travel Speed	
	Size	Designation		Amperage Range	AC/DC				
1	1/8". 5/32"	A5.1 6010	15-30	75-140. 100-175	DC	Electrode Positive	Downhill	6-16	IPM
2	5/32". 3/16"	A5.5 8010	20-32	100-165 130-210	DC	Electrode Positive	Downhill	6-16	IPM
3+	5/32". 3/16"	A5.5 8010	19-32	100-165 130-210	DC	Electrode Positive	Downhill	6-16	IPM

Time Lapse Bead 1 to Bead 2: 5 Minutes Bead 2 to each succeeding bead: 10 Minutes

Line Up Clamp: ☐ Internal ☒ External ☒ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☒ Power Tools ☒ Hand Tools

Prepared by: Date/Time Field Dec 5, 2014

Approved by: Date/Time Field Dec 5, 2014

Rev. 0 04/08/15

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE: Grade "B" Butt Weld (6010, 8010)

WPS #: WPS-VGS-B-2: 2014-2

Supporting Procedure Qualification Record: PQR-VGS-B-2: 2014-2

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding: Flux-Cellulose

Pipe Material Description: ☐ Group A ☒ Group B ☐ Group C : Specify

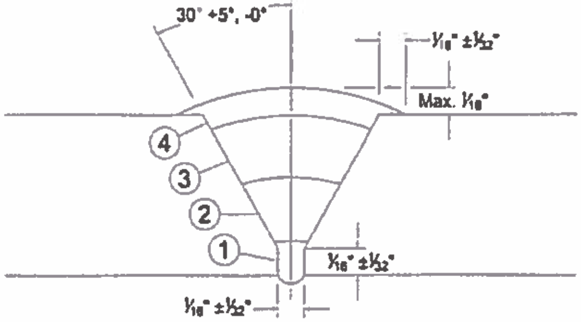
Diameter: ☐ OD < 2.375 Inches ☒ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☒ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☒ Group 1 A5.1 E6010 ☒ Group 2 A5.5 E8010 ☐ Group 3

Preheat: 250°F (if ambient below 40°F, 300°F)

Postheat: N/A



NOT TO SCALE

Bead #	Electrode		Voltage Range	Current		Polarity	Direction of Travel	Travel Speed
	Size	Designation		Amperage Range	AC/DC			
1	1/8", 5/32"	5.1 6010	15-30	75-135, 100-175	DC	Electrode Positive	Downhill	6-16 IPM
2	5/32", 3/16"	5.5 8010G	20-32	100-165 120-210	DC	Electrode Positive	Downhill	6-16 IPM
3+	5/32", 3/16"	5.5 8010G	20-32	100-175 130-210	DC	Electrode Positive	Downhill	6-16 IPM

Time Lapse Bead 1 to Bead 2: 5 minutes Bead 2 to each succeeding bead: 20 minutes

Line Up Clamp: ☐ Internal ☒ External ☒ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☒ Power Tools ☒ Hand Tools

Prepared by: Date/Time Field Dec 5, 2014

Approved by: Date/Time Field Dec 5, 2014

Rev. 0 04/08/15

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Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE Grade "B" Branch Tee (6010, 8010)

WPS # WPS-VGS-B-1: 2014-2

Supporting Procedure Qualification Record: PQR-VGS-B-1: 2014-2

In accordance with API 1104

Welding Process: SMAW **Position:** Fixed **Joint Design:** V Bevel (see sketch) **Minimum # Passes:** 3 **Shielding:** Flux-Cellulose

Pipe Material Description: ☒ Group A ☐ Group B ☐ Group C : Specify

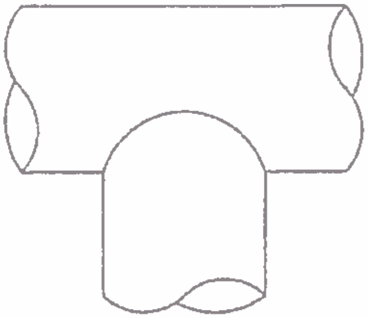
Diameter: ☐ OD < 2.375 Inches ☒ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

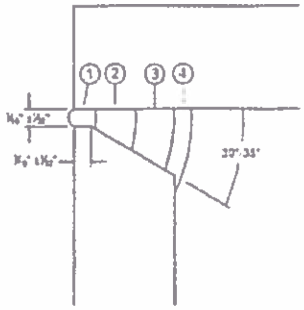
Wall Thickness(es): ☐ Nominal WT < 0.188 In ☒ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☒ Group 1 A5.1 E6010 ☒ Group 2 A5.5 E8010 ☐ Group 3

Preheat 250°F (if ambient is below 40°F, 300°F)

Postheat N/A





NOT TO SCALE

Bead #	Electrode Size	Electrode Designation	Voltage Range	Current Amperage Range	Current AC/DC	Polarity	Direction of Travel	Travel Speed
1	1/8", 5/32"	5.1 6010	15-30	75-135, 100-175	DC	Electrode Positive	Downhill	6-16 IPM
2	5/32", 3/16"	5.5 8010G	20-32	100-165 130-210	DC	Electrode Positive	Downhill	6-16 IPM
3+	5/32", 3/16"	5.5 8010G	20-32	100-165 130-210	DC	Electrode Positive	Downhill	6-16 IPM

Time Lapse Bead 1 to Bead 2: 5 minutes Bead 2 to each succeeding bead: 20 minutes

Line Up Clamp: ☐ Internal ☒ External ☒ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☒ Power Tools ☒ Hand Tools

Prepared by: **Date/Time Field** Dec 5, 2014

Approved by: **Date/Time Field** Dec 5, 2014

Rev. 0 04/08/15

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE Grade "B" Branch Tee (6010)

WPS # WPS-VGS-B-1: 2014-1

Supporting Procedure Qualification Record: PQR-VGS-B-1: 2014-1

In accordance with API 1104

Welding Process: SMAW **Position:** Fixed **Joint Design:** V Bevel (see sketch) **Minimum # Passes:** 3 **Shielding:** Flux-Cellulose

Pipe Material Description: ☐ Group A ☒ Group B ☐ Group C : Specify

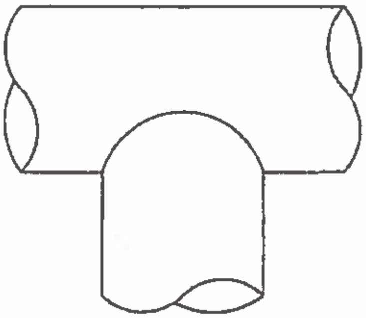
Diameter: ☐ OD < 2.375 Inches ☒ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

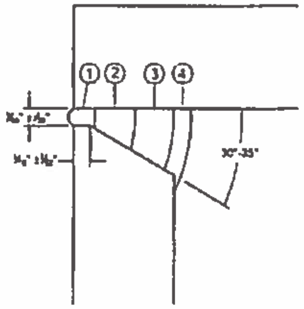
Wall Thickness(es): ☐ Nominal WT < 0.188 In ☒ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☒ Group 1 A5.1 E6010 ☐ Group 2 ☐ Group 3

Preheat 250°F (if ambient is below 40°F, 300°F)

Postheat N/A





NOT TO SCALE

Bead #	Electrode Size	Electrode Designation	Voltage Range	Current Amperage Range	Current AC/DC	Polarity	Direction of Travel	Travel Speed
1	1/8", 5/32"	A5.1 6010	15-30	75-135, 100-175	DC	Electrode Positive	Downhill	6-16 IPM
2	5/32", 3/16"	A5.1 6010	20-32	100-175 140-225	DC	Electrode Positive	Downhill	6-16 IPM
3+	5/32", 3/16"	A5.1 6010	20-32	100-175 140-225	DC	Electrode Positive	Downhill	6-16 IPM

Time Lapse Bead 1 to Bead 2: 5 minutes Bead 2 to each succeeding bead: 20 minutes

Line Up Clamp: ☐ Internal ☒ External ☒ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☒ Power Tools ☒ Hand Tools

Prepared by: Date/Time Field Dec 5, 2014

Approved by: Date/Time Field Dec 5, 2014

Vermont Gas

WELDING PROCEDURE SPECIFICATION

TITLE Grade "B" Butt Weld (6010)

WPS # WPS-VGS-B-2: 2014-1

Supporting Procedure Qualification Record: PQR-VGS-B-2: 2014-1

In accordance with API 1104

Welding Process: SMAW Position: Fixed Joint Design: V Bevel (see sketch) Minimum # Passes: 3 Shielding: Flux-Cellulose

Pipe Material Description: ☐ Group A ☒ Group B ☐ Group C : Specify

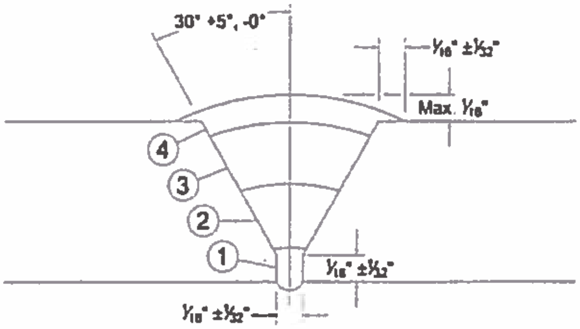
Diameter: ☐ OD < 2.375 Inches ☒ OD 2.375 to 12.750 Inches ☐ OD > 12.750 Inches

Wall Thickness(es): ☐ Nominal WT < 0.188 In ☒ Nominal WT 0.188 to 0.750 In ☐ Nominal WT > 0.750 In

Filler Metal Group(s): ☒ Group 1 A5.1 E6010 ☐ Group 2 ☐ Group 3

Preheat: 250°F (if ambient below 40°F, 300°F)

Postheat: N/A



NOT TO SCALE

Bead #	Electrode		Voltage Range	Current		Polarity	Direction of Travel	Travel Speed
	Size	Designation		Amperage Range	AC/DC			
1	1/8", 5/32"	A5.1 6010	15-30	75-150, 100-175	DC	Electrode Positive	Downhill	6-16 IPM
2	5/32", 3/16"	A5.1 6010	20-32	100-175 140-225	DC	Electrode Positive	Downhill	6-16 IPM
3+	5/32", 3/16"	A5.1 6010	20-32	100-175 140-225	DC	Electrode Positive	Downhill	6-16 IPM

Time Lapse Bead 1 to Bead 2: 5 minutes Bead 2 to each succeeding bead: 20 minutes

Line Up Clamp: ☐ Internal ☒ External ☒ Not Required Removal (if used): After minimum of 50% of root bead welding

Cleaning and/or Grinding: ☒ Power Tools ☒ Hand Tools

Prepared by: Lu Brown Date/Time Field: Dec 5, 2014

Approved by: Date/Time Field: Dec 5, 2014

Rev 0 04/08/15

Q. Welding rod stubs or unused welding rod shall be carefully removed from the site and shall not be discarded in the ditch, right-of-way or elsewhere on the site.

R. No miter joints allowed.

S. During the final tie-in section the pipe shall be supported by side booms until all filler passes are complete.

3.4 WELD INSPECTION & NON-DESTRUCTIVE EXAMINATION

A. All welds shall be 100% radiographically inspected at the OWNER'S expense according to API 1104. If the results of these inspections indicate the welds to be defective, CONTRACTOR shall replace or repair the defective welds at CONTRACTOR'S expense. If the cut-out method of examination of weld is employed by the OWNER, the OWNER may, in the judgment of its OWNER INSPECTOR, cut-out and test any welds designated by him. Should such cut-out welds pass the requirements of API 1104, the cost of cutting out and subsequent tie-in will be borne by the OWNER. The cost of cutting out and replacing any welds that fail the tests shall be borne by the CONTRACTOR.

B. Liquid dye penetrant inspection, magnetic particle inspection or ultrasonic inspection may be utilized by OWNER on a case-by-case basis. Acceptance criteria for these inspections are as stated in API 1104.

3.5 WELD REPAIRS

A. Any defect found in a weld, which is determined to be detrimental to its serviceability, shall be either ground out and re-welded, or removed from the line as a cylinder and replaced by welding in a new section of pipe.

B. If visual or radiographic inspection indicates a weld to be defective, the CONTRACTOR, at no additional cost to the OWNER, shall cut a cylinder of pipe containing such weld from the pipeline and replace it with new pipe or shall have the defective weld repaired in accordance with API 1104. Correction of an individual bead prior to the laying of a succeeding bead is not considered a repair of a defect under these specifications.

C. Preheating shall be used according to the WPS. Such preheating shall be accomplished by a method acceptable to the OWNER and shall cover at least four (4) inches wide on each side of the weld. Heating shall not char the pipe coating. Preheat temperature shall be checked by use of temperature indicating crayons.

D. All repair and replacement welds shall be 100% radiographically inspected and shall meet the acceptance standards of API 1104.

E. Only one repair shall be allowed per girth weld. The necessity of a second weld repair constitutes a mandatory cut-out.

F. The accumulated length of weld repairs shall not exceed 8% of the total length of the girth weld.

G. Under no circumstances should attempts be made to repair cracks in a weld. All cracks shall be cut outs.

TAB 3

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ☒ PA ☐

(Check appropriate box to indicate corrective or preventive action)

Initiator: K. Oxholm

Corrective Action # 2015-004

or

Date: 10/19/15

Preventive Action #

	Date Due	By/Assigned to	Completed Initials & Date
Investigation		Kristy Oxholm	KHO 11/25/2015
Implementation		Lee Brown	
Audit			
CAR/PAR closed		John St. Hilaire	12/11/15

Description of Issue

Pipe at appx. 398+00 to 406+00 has garage/trash mixed in with backfill. Pipe is reportedly padded with select backfill, has mirify fabric laid and the backfill in question on top of the mirify. Varying reports describe the garbage/trash as mostly broken glass to chunks of metal and other household garbage/trash.

Work Processes need to be modified or ceased during investigation?: Yes ___ No x
If so, specify:

Approved by:

Date: 12/11/15

Investigation Finding

In speaking with a variety of people there is clear cause for concern. At least two test pits will be dug to determine the extent of the problem and to complete this investigation.

During the period of 12/1/15 to 12/8/15 a total of 8 test pits were dug in the area of concern. No trash or garbage was found in close proximity to the installed pipe. A small amount of small items was found in the very top layer of the cover, well above the pipe. No mirify fabric was found at any of the dig sites. (see attached pictures).

Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

As a result of the findings in the test pits, no corrective action is required.

VGS will be commissioning the cathodic protection (CP) system at the gas-up of the pipeline. This will provide protection should any coating holidays exist on the pipeline because of the trash/debris. Additionally, a direct assessment type survey will be conducted in the spring of 2016. If any part of the coating is damaged in this area because of trash/debris, the survey will indicate an anomaly and it can properly be inspected and remediated.

Action Taken / Verification

Any future re-evaluation and follow-up required? Yes ___ No x

If so, specify:

Verified by: ______________________ Date: ____________

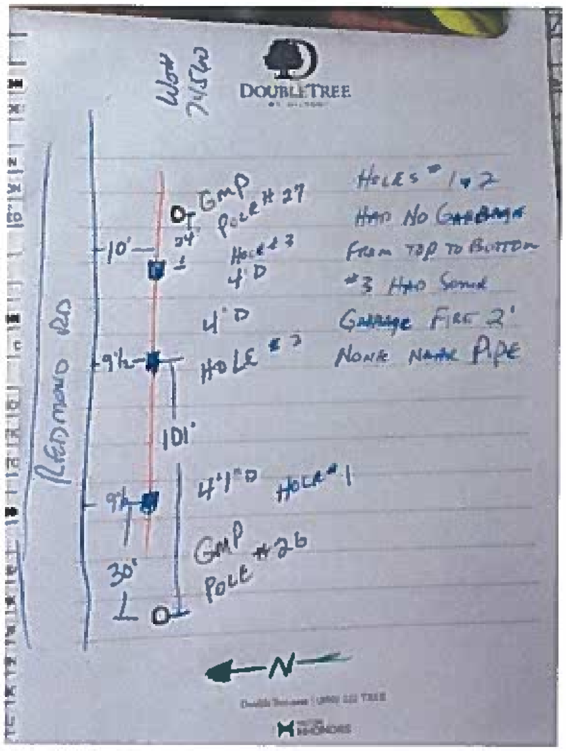
Was action taken effective? ☐ Yes ☐ No If no, new CA/PA number: ________

Comments: ______________________

12/01/15 Dig #1

12/01/15 Dig #2

12/7/15 Digs



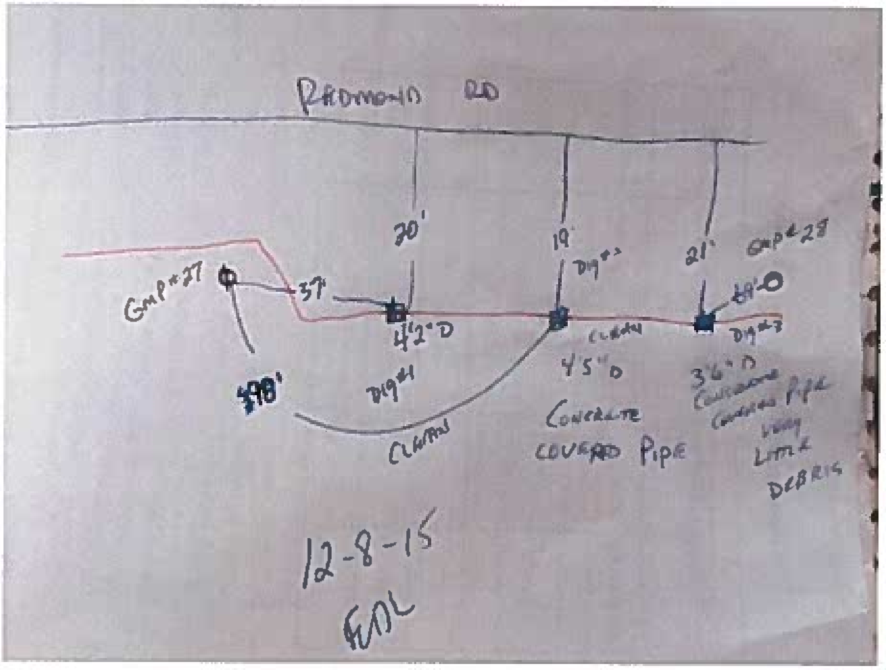
Holes # 1 & 2
Had No Garbage
From Top to Bottom
#3 Had Some
Garbage Fire 2'
None Near Pipe

Dig #1

Dig #2

Dig #3

12/8/15 Digs



Dig #1

Dig #2

Dig #3

Dig #2

VERMONT GAS SYSTEMS, INC.
TRANSMISSION LINE EXPOSURE REPORT

This report is to be completed when excavation work is being done near a transmission pipeline.

Date: 12-7-15
Clock #: 616
Dig safe Ticket Number: 2015480075
Photo's taken [✓ Y] / N
Location: REDMOND RD.
Pipe Diameter: 12"
Wall Thickness:
Municipality: WILLISTON
VGS facilities marked: Y / N
As-Built Station No.
Pipeline As-Built Sheet: of
High Consequence Area: Y / [✓ N]
HCA segment number:
CP Pipe to Soil Reading: N/Av
Coating Type:
Pipe Depth:
Coating Condition: [✓ Bonded] Slight disbondment Disbonded
Coating Replaced: Y / [✓ N]
Type Replacement Coating:
Replacement Coating Length:
Exposed bare pipe: Y / [✓ N]
Pitting: Y / [✓ N]
Pitting Location:
UT Gauge testing: N/A
Soil: [✓ Sand] Clay [✓ Loam] Cinders Refuse
Soil Packing: Loose [✓ Medium] Hard
Soil Sample Taken: Y / [✓ N]
Soil Moisture Content: Dry [✓ Damp] Wet
Foreign Pipe crossing: Y / [✓ N]
Foreign Pipe crossing clearance:
Foreign pipe crossing ties taken: Y / N

DIGGING TO INSPECT 12" FOR ANY GARBAGE BURIED OVER & AROUND PIPE INBETWEEN GMP POLE # 26 & 28 PIPE NOT GASED UP

File: T\OPS\ TRANSMISSION LINE EXPOSURE REPORT

VERMONT GAS SYSTEMS, INC.
TRANSMISSION LINE EXPOSURE REPORT

This report is to be completed when excavation work is being done near a transmission pipeline.

Date: 12-8-15 | Clock #: 6116 | Dig safe Ticket Number: 20154800754 | Photo's taken [✓ Y] / N

Location: REDMOND RD | Pipe Diameter: 12" | Wall Thickness:

Municipality: WILLISTON | VGS facilities marked: Y / N | As-Built Station No.

Pipeline As-Built Sheet: of | High Consequence Area: Y / [✓ N] | HCA segment number:

CP Pipe to Soil Reading: N/A v | Coating Type: | Pipe Depth:

Coating Condition: [✓ Bonded] Slight disbondment Disbonded | Coating Replaced: Y [✓ N]

Type Replacement Coating: | Replacement Coating Length: N/A

Exposed bare pipe: Y / [✓ N] | Pitting: Y / [✓ N] | Pitting Location: N/A | UT Gauge testing: N/A

Soil: [✓ Sand] Clay [✓ Loam] Cinders Refuse | Soil Packing: Loose [✓ Medium] Hard

Soil Sample Taken: Y / N | Soil Moisture Content: Dry [✓ Damp] Wet

Foreign Pipe crossing: Y / [✓ N] | Foreign Pipe crossing clearance: N/A | Foreign pipe crossing ties taken: Y / N N/A

DIGGING TO INSPECT NON GASED UP 12" FOR ANY GARBAGE BURIED OVER OR AROUND PIPE IN BETWEEN GMP # POLE 27 & 28

TAB 4

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ☒ PA ☐
(Check appropriate box to indicate corrective or preventive action)

Initiator: K. Oxholm

Corrective Action # 2015-005

or

Date: 10/19/15

Preventive Action #

	Date Due	By/Assigned to	Completed Initials & Date
Investigation	11/30/2015	Christopher LeForce	CAL 12/11/2015
Implementation	12/1/2015	Christopher LeForce	CAL 12/11/2015
Audit			
CAR/PAR closed			

Description of Issue

Pipe installed by 2014 Contractor (Over & Under) with insufficient cover in numerous locations.

Work Processes need to be modified or ceased during investigation?: Yes ___ No x
If so, specify:

Approved by:

Date: 12/4/15

Investigation Finding

After reviewing as-built data collected by CHA, it was found that the ANGP pipeline that was installed by Over and Under in 2014 had multiple areas with insufficient cover. The majority of the areas with insufficient cover pertained to the minimum depth of cover in the VTrans permit and other permits/agreements with various agencies. The final list identified 77 areas along the pipeline where depth of cover needed to be investigated and then remediated.

Page 2 of 2
Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

The first step was to survey the areas identified to ensure that the proper finished grade was surveyed and that the GPS data was correct and accurate. There were multiple areas where the depth of cover was only lacking by 1-3 inches. All the areas were surveyed and the pipe was probed with a probe bar to confirm the depth. The results can be separated into three general categories; areas where the data was off and the pipe was actually installed to the proper depth, areas where the grade was not restored to pre-construction conditions, and areas where the pipe was not installed to proper depth.

Going forward, the as-built depth of cover data will be looked at more closely and in a more timely manner at the time of construction so that it can be remediated quickly, efficiently, and effectively.

Action Taken / Verification

See attached

Any future re-evaluation and follow-up required? Yes x No ___
If so, specify:

Final as-builts for approximately the first 10.5 miles of the ANGP pipeline will be reviewed once complete to ensure proper depth of cover as related to the specific permits, specifications, and agreements.

Verified by: ______________________ Date: ______________

Was action taken effective? ☐ Yes ☐ No If no, new CA/PA number: ________

Comments: ______________________

Attachment to CAR 2015-005
Action Taken / Verification

The areas where probing verified that the pipe was installed to the proper depth of cover were removed from the list. This included a total of 24 areas. There were a total of 41 areas where regrading was performed to achieve the proper depth of cover. The Survey Team set stakes in these areas which indicated the additional depth of cover that was needed. There were 6 areas where the pipe was completely removed, the trench was dug to ensure proper depth, and the pipe reinstalled to the proper depth. At this time there is still one area that needs regrading to achieve proper depth of cover, which will be completed after the construction mats are removed from this area.

There were 5 areas where the pipe was not installed to the proper depth that was included in the VTrans permit related to the proposed Circumferential Highway or "Circ." Since this project has been planned for over 20 years and there is no currently schedule to build it, VGS received a permit amendment/waiver to leave it at the current installed location. VGS asked for this amendment/waiver because the design of the highway could easily change in the future and per the agreement VGS has with VTrans for the pipeline in the Circ corridor, VGS is responsible to move it if there are any conflicts between the highway infrastructure and the pipeline.

A final summary table is attached denoting all 77 areas.

Addison Natural Gas Project (ANGP) - Segment 1
Depth of Cover Remediation Table/List

Area #	Approx. Begin STA.	Approx End STA.	Min. Cover Needed (ft)	Reason for Lack of Cover (other then 3 ft)	Approx. Additional Cover Needed (ft)	VGS to Fix?	Remediation Plan	Additional Notes
1	126+50	128+00	4	VTrans	0.7-0.8	YES	Completed.	
2	130+00	131+00	4	VTrans	0.3-0.4	YES	Completed.	
3	132+00	132+00	4	VTrans	0.1	YES	Completed.	
4	133+00	135+50	4	VTrans	0.2-0.7	YES	Completed.	
5	140+00	140+00	4	VTrans	0.6	YES	Completed.	
6	142+50	143+50	4	VTrans	0.5-1.2	YES	Completed.	
7	144+50	148+00	4	VTrans	0.1-0.6	YES	Completed.	
8	188+75	190+00	4	VTrans	0.1-0.9	YES	Completed.	
9	192+75	192+75	4	VTrans	0.5	YES	Completed.	
10	193+75	193+75	4	VTrans	0.3	YES	Completed.	
11	197+00	207+00	4	VTrans	0.1-1.2	YES	Completed.	
12	208+00	208+00	4	VTrans	0.6	YES	Completed.	
13	229+75	229+75	4	VTrans	0.1	YES	Completed.	
14	230+50	230+50	4	VTrans	0.2	YES	Completed.	
15	322+75	324+50	4	VTrans	0.3-1.4	YES	Completed.	
16	326+50	326+50	4	VTrans	0.5	YES	Completed.	
17	331+00	332+00	4	VTrans	0.3-0.6	YES	Completed.	
18	333+75	333+75	4	VTrans	0.2	YES	Completed.	
19	338+50	339+50	4	VTrans	0.2-0.4	YES	Completed.	
20	340+50	340+50	4	VTrans	0.4	YES	Completed.	
21	344+00	346+00	4	VTrans	0.2-1.9	YES	Completed.	
22	346+75	346+75	4	VTrans	0.1	YES	Completed.	
23	348+50	348+50	4	VTrans	0.5	YES	Completed.	
23A	349+25	351+25	5	Stream Crossing	0.6-2.2	YES	Completed.	Cut out pipe section and re-installed to proper depth. Work completed by Michels.
24	352+00	352+00	4	Agriculture	0.6	YES	Completed.	
25	353+50	354+00	4	Agriculture	0.1-0.8	YES	Completed.	
26	355+00	355+00	4	Agriculture	0.1	YES	Completed.	
27	366+75	366+75	4	Agriculture	0.9	YES	Completed.	
28	367+25	367+25	4	Agriculture	0.8	YES	Completed.	
29	369+25	369+25	4	Agriculture	0.7	No	None.	Probed, measured 4.0 feet or greater.
30	370+75	370+75	5	Stream Crossing	1.3	No	None.	No stream or ditch. Just wet. No fix needed.
31	375+50	379+75	3	Typical	0.1-0.4	No	None.	Probed, measured 3.0 feet or greater.
32	381+75	384+50	3	VTrans	0-0.7	YES	None.	Verified with VTrans 3 feet of cover is acceptable is this area.
32A	386+50	387+50	3	Typical	0.2-0.6	YES		Mats were in the way. Probed to verify. Need to fix still.
33	401+00	404+00	3			No	None.	Probed, measured 3.0 feet or greater.
34	405+25	408+50	3			No	None.	Probed, measured 3.0 feet or greater.
35	409+50	410+50	3			No	None.	Probed, measured 3.0 feet or greater.
36	414+25	415+00	3			No	None.	Probed, measured 3.0 feet or greater.
37	415+50	418+50	3	Typical	0.1-0.3	No	None.	Probed, measured 3.0 feet or greater.
38	418+75	420+00	4	Typical	0.3-1.7	YES	Completed.	Cut out pipe section and re-installed to proper depth. Work completed by Michels.
39	423+25	423+25	3	Typical	0.2	YES	Completed.	
40	425+50	426+75				No	None.	Probed, measured 3.0 feet or greater.
41	430+00	430+00	3	Typical	1.2	No	None.	Probed, measured 3.0 feet or greater.
42	433+00	435+00	4	VELCO	0.5-0.7	YES	Completed.	Probe to verify. VELCO Easement
43	435+75	435+75	4	VELCO	0.4	Yes	Completed.	Probe to verify. VELCO Easement
44	437+75	437+75	3	Typical	0.2	No	None.	Probed, measured 3.0 feet or greater.
45	440+25	440+75	5	Stream Crossing	0.8-1.0	Yes	Completed.	Cut out pipe section and re-installed to proper depth. Work completed by Michels.
46	443+75	443+75	3	Typical		No	None.	Probed, measured 3.0 feet or greater.
47	445+25	445+25	3	Typical	0.2	Yes	Completed.	
48	447+75	447+75	3	Typical	0.1	No	None.	Probed, measured 3.0 feet or greater.
49	453+50	455+00	3	Typical		No	None.	Probed, measured 3.0 feet or greater.
50	456+25	456+25	4	VELCO		No	None.	Probed, measured 4.0 feet or greater.
51	457+50	465+50	4	Agriculture	0.1-0.4	Yes	Completed.	Waiver from VTrans for the cut area.
52	465+75	478+50	Varies	VTrans/VTrans Cut	0.1-13.0	No	None.	Waiver from VTrans.
52A	474+00	474+75	3	Typical	0.3-0.8	Yes	Completed.	
53	478+50	481+00	4	VTrans		No	None.	Probed, measured 4.0 feet or greater.
53A	480+80	480+80	3	Typical	0.1	No	None.	Probed, measured 3.0 feet or greater.
54	482+50	488+00	3	Typical		No	None.	Probed, measured 3.0 feet or greater.
55	488+50	489+50	4	VTrans	0.5-0.9	Yes	Completed.	
56	492+60	492+60	4	VTrans	0.6	Yes	Completed.	
57	493+50	496+00	4 to 10	VTrans	0.1-6.0	No	None.	Waiver from VTrans
57A	494+00	495+75	4	VTrans	0.1-0.3	Yes	Completed.	
58	499+00	500+50	4	VTrans		No	None.	Probed, measured 4.0 feet.
59	515+25	516+25	4 to 9	VTrans Cut	0.1 to 5	No	None.	Waiver from VTrans.
60	516+75	520+50	4, 4 to 8	VTrans Cut	0.1 to 4.0	No	None.	Waiver from VTrans.
60A	518+50	519+00	4	VTrans	0.2-0.5	Yes	Completed.	
61	524+50	524+50	4	VTrans	0.1	Yes	Completed.	
62	529+00	532+00	4 to 9	VTrans Cut	0.2-4.0	No		Probed, measured 4.0 feet or greater.
63	532+00	534+50	4 to 8	VTrans	0.2-4.0	No		Probed, measured 4.0 feet or greater.
64	535+00	535+00	4	VTrans Cut	0.4	No		Probed, measured 4.0 feet or greater.
65	538+50	540+50	4 to 13	VTrans Cut	0.1-9.0	No		Probed, measured 4.0 feet or greater.
65A	539+00	540+25	4	VTrans	0.1	Yes	Completed.	
66	538+25	538+25	4	VTrans	0.4	Yes	Completed.	
67	544+00	546+00	4 to 18	FEH	0.2-13.0	No	None.	Meets permit criteria based on as-built profile per Josh Sky.
68	547+25	548+25	4	VTrans	0.4-2.1	Yes	Completed.	Cut out pipe section and re-installed to proper depth. Work completed by Michels.
69	552+00	552+00	4	Agriculture	0.5	Yes	Completed.	Pipe cut and lowered during the installation of the 12" x 6" tee for the Williston Gate Station. Work completed by Michels.
70	553+50	553+50	4	Agriculture	0.6	Yes	Completed.	Pipe cut and lowered during the installation of the 12" x 6" tee for the Williston Gate Station. Work completed by Michels.

77 Total number of areas
6 Areas remediated by cutting out the pipe and reinstalling.
24 Areas proved to have sufficient cover by probing the pipe.
5 Areas obtained a VTrans waiver to leave pipe as installed.
41 Areas remediated by regrading.
1 Area remaining to be remediated.

TAB 5

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ■ PA ☐

(Check appropriate box to indicate corrective or preventive action)

Initiator: K. Oxholm

Corrective Action # 2015-006

or

Date: 11/18/2015

Preventive Action #

	Date Due	By/Assigned to	Completed Initials & Date
Investigation	12/9/2015	Christopher LeForce	CAL 12/11/2015
Implementation	12/11/2015	Christopher LeForce	CAL 12/11/2015
Audit			
CAR/PAR closed			

Description of Issue

In areas where pipe was installed by the 2014 Contractor (Over & Under) on ANGP, trench breakers were not installed as designed in numerous locations. A table attached, titled "ANGP Trench Breaker As-built 2014 (Segment 1)", shows the general design locations by station number and the corresponding as-built location if installed. There were both sand trench breakers and bentonite trench breakers on this list. Also there were some trench breakers installed where there was not a designed location.

Work Processes need to be modified or ceased during investigation?: Yes ___ No x
If so, specify:

Approved by:

Date: 12/11/15

Investigation Finding

The list titled "ANGP Trench Breaker As-built 2014 (Segment 1)" was reviewed and the locations plotted on a set of design drawings. After talking to field personnel (inspectors), it was determined that some of the locations where trench breakers were designed on paper were omitted because the field conditions warranted them not to be installed. On the other hand there were locations where there was no designed trench breaker, but field conditions warranted one to be installed. There was no documentation of this process.

Vermont Gas

Page 2 of 2

Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

VGS will investigate the areas where a designed trench breaker was not installed. If field conditions show that one is not needed, then it will be documented as to the reason why not. If one is needed, then one will be scheduled to be installed.

While this investigation takes place, VGS Operations will patrol the transmission corridor on a monthly basis, not to exceed 45 days, or after any significant rain event to ensure no erosion occurs due to the lack of a trench breaker. If VGS Operations finds erosion occurring, it will be remediated to ensure the safety of the pipeline.

Action Taken / Verification

Any future re-evaluation and follow-up required? Yes ___ No ___
If so, specify:

As required by code, the transmission corridor is continually patrolled multiple times each year by VGS Operations and one of the items that is looked for is erosion areas or potential erosion areas. Anything that is deemed a threat to the pipe will be remediated by VGS Operations.

Verified by: ______________________ Date: ______________

Was action taken effective? ☐ Yes ☐ No If no, new CA/PA number: ________

____

Comments: ______________________________________

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

▨	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
NONE	N/A	129+15	SAND	
NONE	N/A	132+62	SAND	
NONE	N/A	144+15	SAND	
NONE	N/A	147+22	SAND	
NONE	N/A	150+10	SAND	
187+75	BENTONITE	NONE	N/A	
188+50	BENTONITE	188+78	BENTONITE	
NONE	N/A	189+14	SAND	
NONE	N/A	190+10	SAND	
190+55	BENTONITE	190+53	BENTONITE	
193+15	BENTONITE	193+56	BENTONITE	
194+55	SAND	NONE	N/A	
195+80	SAND	NONE	N/A	
197+00	SAND	NONE	N/A	
202+17	SAND	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
202+95	SAND	NONE	N/A	
211+90	SAND	NONE	N/A	
NONE	N/A	238+79	SAND	
328+10	SAND	327+77	SAND	
328+92	SAND	328+64	SAND	
330+65	SAND	331+22	SAND	
331+40	SAND	331+66	SAND	
343+62	SAND	NONE	N/A	
344+35	SAND	344+50	SAND	
345+08	SAND	345+02	SAND	
347+42	SAND	NONE	N/A	
348+00	SAND	347+80	SAND	
348+60	SAND	NONE	SAND	
348+80	BENTONITE	348+45	BENTONITE	
349+25	BENTONITE	349+52	BENTONITE	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
350+72	BENTONITE	350+72	BENTONITE	
351+06	BENTONITE	351+06	BENTONITE	
367+30	BENTONITE	367+40	BENTONITE	
369+12	BENTONITE	368+72	BENTONITE	
369+47	SAND	NONE	N/A	
370+45	BENTONITE	NONE	N/A	
371+10	BENTONITE	NONE	N/A	
374+22	SAND	NONE	N/A	
375+05	SAND	NONE	N/A	
380+45	SAND	NONE	N/A	
381+40	SAND	NONE	N/A	
380+75	BENTONITE	380+80	BENTONITE	
382+10	BENTONITE	NONE	N/A	
382+60	BENTONITE	NONE	N/A	
384+00	BENTONITE	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

▨	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
384+60	BENTONITE	NONE	N/A	
385+00	BENTONITE	386+12	BENTONITE	
401+49	SAND	NONE	N/A	
403+00	SAND	NONE	N/A	
404+93	SAND	NONE	N/A	
406+42	SAND	NONE	N/A	
407+96	SAND	NONE	N/A	
409+48	SAND	NONE	N/A	
411+00	SAND	NONE	N/A	
429+35	BENTONITE	429+30	BENTONITE	
429+05	BENTONITE	429+43	BENTONITE	
429+50	SAND	NONE	N/A	
430+30	SAND	NONE	N/A	
433+50	SAND	433+53	SAND	
435+00	SAND	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
436+90	BENTONITE	436+70	BENTONITE	
NONE	N/A	437+00	BENTONITE	
437+20	BENTONITE	437+19	BENTONITE	
440+50	BENTONITE	440+22	BENTONITE	
440+70	BENTONITE	441+10	BENTONITE	
448+40	BENTONITE	447+75	BENTONITE	
449+30	BENTONITE	449+09	BENTONITE	
459+50	BENTONITE	NONE	N/A	
460+15	BENTONITE	460+09	BENTONITE	
466+05	BENTONITE	466+00	BENTONITE	
466+55	BENTONITE	466+50	BENTONITE	
468+70	BENTONITE	468+62	BENTONITE	
469+30	BENTONITE	469+35	BENTONITE	
506+45	BENTONITE	NONE	N/A	
507+30	BENTONITE	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
510+25	BENTONITE	509+90	BENTONITE	
511+80	BENTONITE	NONE	N/A	
514+70	BENTONITE	514+89	BENTONITE	
515+50	BENTONITE	515+45	BENTONITE	
540+35	BENTONITE	540+43	BENTONITE	
540+65	BENTONITE	537+60 (STA EQN.)	BENTONITE	
546+30	BENTONITE	546+09	BENTONITE	
547+35	BENTONITE	547+62	BENTONITE	
548+00	BENTONITE	NONE	N/A	
NONE	N/A	549+68	Unk.*	need to confirm with survey TRBKR type
551+00	BENTONITE	NONE	N/A	
552+60	BENTONITE	553+30	Unk.*	need to confirm with survey TRBKR type

TAB 6

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/28/2015

Subject: Welding Line Up Clamp Usage Clarification

Directive Number: 2015-004

The Butt Weld procedures used on this project (WPS-VGS-B-2 2014-2; WPS-VGS-X-65-2 2014-2) indicate that the use of an external line up clamp is allowed, but not required. This directive serves as a notification that the use of an external line up clamp is required on all main line girth welds on this project except when it is not feasible due to situations where the contour of a fitting does not allow use. In such cases the weld will be fitted up in a manner that does not place undue stress on the weldment. This is also stated in the Technical Specification Section 137000 – Welding in Part 3, Subsection 3.3(B).

If another situation arises where use of a clamp is not feasible, then it must be reviewed and approved by the Construction Inspection Team and VGS Operations.

The clamp shall not be removed until a minimum of 50% of the root bead has been placed, according to the instructions in the WPS and Section 137000 – Welding.

This Project Directive replaces 2015-002.

Issued by (print): Christopher LeForce

Signature: 8/28/2015

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

TAB 7

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/29/2015

Subject: Pipe surface preparation for shrink sleeves weld coating

Directive Number: 2015 – 010

Pipe surface preparation for Shrink Sleeves will be sandblasting using the SSPC-SP10 or NACE 2- Near-White Blast Cleaning Specificiation.

Method of surface preparation shall continue to be recorded for each weld.

Issued by (print): Christopher LeForce

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ☒ PA ☐

(Check appropriate box to indicate corrective or preventive action)

Initiator: K. Oxholm

Corrective Action # 2015-003

or

Date: 9/11/15

Preventive Action #

	Date Due	By/Assigned to	Completed Initials & Date
Investigation		Eric Curtis	
Implementation		Eric Curtis	
Audit			
CAR/PAR closed			

Description of Issue

Pritec patches were discovered to not be adhering appropriately to the Pritec pipe.

Work Processes need to be modified or ceased during investigation?: Yes x No ___
If so, specify:

Patches were one of two acceptable repair methods. Patch use was discontinued during investigation. Canusa sleeves were the only remaining acceptable method during this time.

Approved by:

Date: 12/4/15

Investigation Finding

Discussion with Liberty Coatings representative Wally Armstrong determined that the patch kits used during 2014 were CRP-65 kits. Prior to the 2015 construction season the CRP-65 kits were discontinued by the manufacturer. The replacement for the discontinued kit is the CRP-Ultra kit. The kits used in 2015 were CRP-Ultra kits. The adherence problem appears to affect the CRP-Ultra kits.

A variety of kits were used at the coating mill and several patches that were installed at the mill were tested and found to be adhering properly. There were patches that did not appear to be adhering properly upon receipt of the pipe at the laydown yard. Those that were not adhering were repaired in the laydown yard.

Vermont Gas

Page 2 of 2

Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

Recommend switching to use of the Canusa sleeve as the sole method of repair in this situation. Additional methods of repair may be reviewed and approved in the future.

Action Taken / Verification

The use of CRP-Ultra kits was discontinued in favor of using Canusa sleeves until such time as an alternative repair method is approved.

Direct assessment to be conducted in 2016 will address concerns about any potential holidays. In addition, VGS will be commissioning the cathodic protection (CP) system at the gas-up of the pipeline. This will provide additional protections should any coating holidays exist on the pipeline.

Any future re-evaluation and follow-up required? Yes x___ No ___
If so, specify:

The planned direct assessment will be used to verify whether any coating holidays exist.

Verified by: ______________________ Date: ______________

Was action taken effective? ☐ Yes ☐ No If no, new CA/PA number: ________

____

Comments: ______________________________________

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/14/2015

Subject: Sacrificial Weld Coating on HDD Installations

Directive Number: 2015 – 009

For added abrasion resistance on horizontal direction drill (HDD) installations, Canusa's Wrapid Shield™ XL shall be installed over the Powercrete® R-95 coated weld. Please follow all manufacturer's instructions regarding the installation of both coatings and ensure the coatings are installed by qualified contractor personnel. All installations shall be observed by an inspector from the VGS Construction Inspection Team. Also ensure that at least one adhesion test is completed on the Powercrete® R-95 coating before the Wrapid Shield™ XL is installed.

At least one weld coating shall be visually inspected and jeeped after the pullback operation.

Attached for added reference is a memo explaining the use of additional abrasion resistance coating, along with the installation guide and product data sheet for the Wrapid Shield™ XL.

Issued by (print): Christopher LeForce

Signature: 9/14/2015

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

MEMORANDUM

TO: Addison Rutland Natural Gas Project (ARNGP) File

FROM: Christopher LeForce

DATE: September 4, 2015

RE: Use of sacrificial coating over primary weld coatings on horizontal directional drilling (HDD) installations

Vermont Gas Systems, Inc. (VGS) is proposing to use a sacrificial coating over the primary weld coating on (HDD) installations. VGS is using Powercrete® R-95 liquid epoxy for the primary corrosion protection at the welds. The R-95 is a single coat, 100% solids, high build epoxy novolac that coats pipelines. As an abrasion resistant overlay (ARO) it is compatible with fusion bond epoxy (FBE) and CTE mainline coatings. The purpose of the sacrificial coating is to add additional protection to the weld coating during pullback of the pipe during the HDD process.

In HDD installations, a typical corrosion coating, like FBE, cannot be used because of the potential for the coating to be damaged down to bare metal. For that reason either an ARO coating is used over the FBE or a harder, more durable coating is used. The line pipe is coated with a two-layer system, a FBE coating under an ARO coating, which is the sacrificial coating. In a similar manner, VGS is proposing to add a sacrificial coating over the R-95 coating to provide additional protection.

VGS is proposing to use Wrapid Shield™ XL manufactured by Canusa-CPS, a Shawcor Company. Wrapid Shield™ XL is a fiberglass cloth, pre-impregnated with a resin that can be activated by salt or freshwater to coat and protect any diameter of pipe within minutes. The product is formulated to resist shear, impact and abrasion on pipe coating systems above and below ground such as fittings and joints on all mill-coated pipe and as an outer wrap over heat-shrinkable sleeves for added mechanical protection.

The purpose of the pipeline coating is to provide a barrier between the steel pipe and the elements that can cause it to corrode or rust. The coating is the primary corrosion control method of protection the pipe. If there is a coating break or holiday, then the pipe is protected by the secondary measure of cathodic protection (CP).

The question that has been brought up is does applying this type of coating cause cathodic shielding. Shielding is caused by an external material that prevents the cathodic protection (CP) current from getting to the steel pipe. Technically, properly applied coating fits into the definition of cathodic shielding because it does not allow any connection with a foreign material. In order for CP to work you need a full circuit for the current to flow from the pipe to the soil and back. Other foreign materials can cause shielding which include plastic sheets with no adhesion, tree roots, rocks, soil, improper backfill/compaction, casings, and any other high resistance materials.

As supported by a letter from Steve Anderson (NACE CIP2 # 25805) of Shawcor, dated August 12, 2015, a properly applied coating will not cause cathodic shielding. In this case when both coatings are applied correctly and appropriately tested to ensure no holidays, this will not cause a cathodic shielding condition. The sacrificial coating of the Wrapid Shield™ XL will help protect the primary coating of the R-95 from damage during the HDD pullback.

The primary coating of R95 will be applied per manufacturer's procedures, inspected by the construction inspection team, and properly checked for any coating holidays before the wrap is applied to ensure the integrity of the coating. After the installation of the pipe is complete, at least one coated weld will be inspected per the VGS inspection criteria.

In conclusion, the Wrapid Shield™ XL will help ensure the primary coating is protected and can function as designed in protecting the steel pipe. If the sacrificial coating is not used, there is a higher potential of having coating holidays in the primary coating and it would not be able to function properly. In this case the secondary corrosion control method of CP would be used to protect the pipe. In 49 CFR Part §192.461 External corrosion control: Protective coating, it states "if coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation." Using the Wrapid Shield™ XL is the best method of minimizing the damage to the primary coating during installation.

August 12, 2015

To:
Mr. Wally Armstrong
Liberty Sales and Distribution
2880 Bergey Rd. Ste. F
Hatfield, PA. 19440

RE:
WrapidShield-XL Compatibility with Powercrete R95 and Nap-Gard FBE's / ARO's, and Cathodic Shielding Concerns on VGS's Addison County Expansion Project.

Dear Mr. Armstrong,

Canusa's WrapidShield-XL product is fully compatible with all 2 part liquid epoxies, all Fusion Bonded Epoxies, and all ARO epoxies (powder or liquid). The XL product consists of a woven glass and a moisture cured Polyurethane. Polyurethanes and epoxies are chemically compatible, and the 2 will adhere to one another given that proper surface preparation is completed (surface abrasion of the FBE/2PLE/ARO).

As far as the Cathodic Shielding concerns, all coatings have the potential to shield if not installed properly. All coatings have electrically resistive properties. Proper application training and following the manufacturers recommended installation procedure will assure that coatings will not shield.

Please let me know if I can be of further assistance.

Sincerely,

Steve Anderson

Steve Anderson
Technical Sales Representative

SHAWCOR

NACE CIP2 # 25805
steve.anderson@shawcor.com
M. 832-314-7110

SHAWCOR
Canusa-CPS
3838 N. Sam Houston Pkwy. East
Ste. 300
Houston, TX. 77032
o +1 800 441 0862
Shawcor.com

CANUSA-CPS
A SHAWCOR COMPANY

Wrapid Shield XL

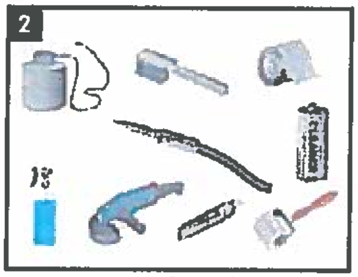
Fiberglass Mechanical Protection for Field Joints on Directionally Drilled Pipelines

Product Description

Wrapid Shield XL is supplied within the kit and is contained in a heat-sealed foil pouch.

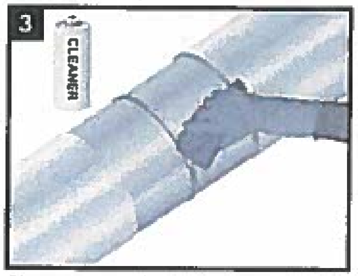
Installer Kit
An Installer Kit is supplied separately and includes Compression Film and Nitrile gloves.

Equipment List



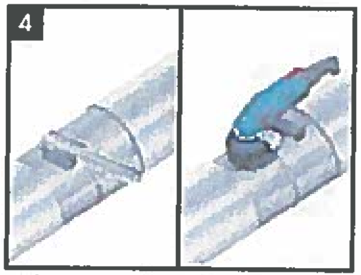
Appropriate tools for surface abrasion and preparation (wire brush/power wire brush or grit blaster, abrasive paper (40-80 grit), Knife, lint free rags, approved solvent and water spray bottle. Standard safety equipment: gloves, safety glasses, hard hat, etc.

Surface Preparation

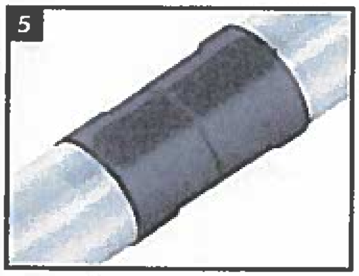


Clean exposed steel and adjacent pipe coating with an approved solvent (Acetone, MEK, Alcohol >96%) to remove the presence of oil, grease, and other contaminants if present. Ensure that the pipe is dry prior to mechanical cleaning.

Surface Preparation

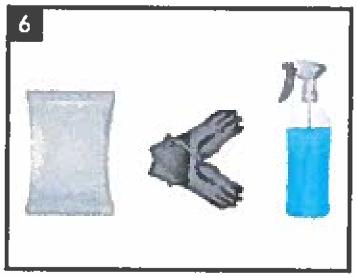


Surface preparation shall be as required for the specific corrosion coating used in conjunction with Wrapid Shield XL.

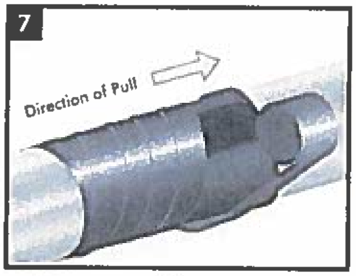


For heat-shrinkable sleeve corrosion coatings use the Canusa product specific installation guide.

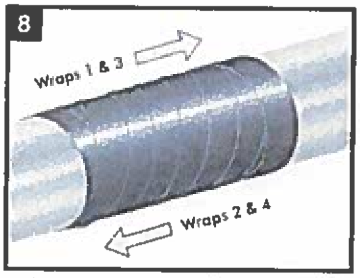
Outer Wrap Application Wrapid Shield XL



Water is needed to activate Wrapid Shield XL. Open the foil pouch, remove the roll. Once opened, the product cannot be repackaged. Wrapid Shield XL is activated using a water sprayer to mist and wet each layer as it is wrapped.



Starting at the trailing end of the field joint, begin the application at a distance of 50mm (2") past the inner corrosion coating and extend the wrap 150 mm (6") beyond the corrosion coating on the leading edge. Apply the first wrap circumferentially around the pipe at a 90° angle. Then begin spiral wrapping with a 50% overlap following the wrapping guideline that is printed on the roll. Apply pressure during application by pulling firmly on the roll as it is applied. Squeeze and mold firmly in the direction of the wrap until tight.



End with a circumferential wrap applied at 90° to the pipe. For high shear or impact requirements, additional layers may be required. To create thinned edges for directional drilling, reduce the overlap in the last 100mm - 150mm of the edges to 10-20% rather than 50%.

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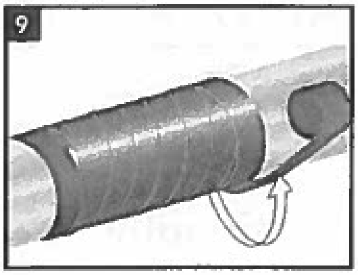
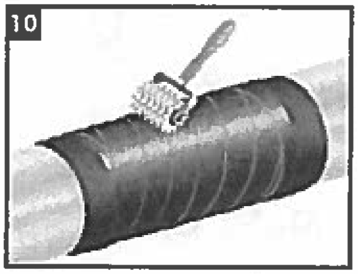


Apply compression film in the same direction as the previous layers with a 50% overlap. Start min. 50mm (2") beyond the outer edge of the Wrapid Shield XL, pulling firmly during application.

NOTE: Compression film should be applied before excess foaming is observed from the Wrapid Shield XL. A second installer should begin this step and follow the Wrapid Shield XL installer(s) as they progress with the wrapping of the pipe. The resin should be compressed and the film perforated as quickly as possible.

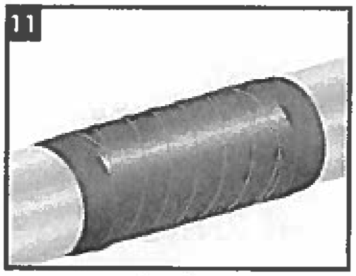
10



Perforate the compression film using a wire brush (or other perforating device) by tapping firmly on the tape with the metal bristles. Perforation allows the CO^2 gas generated by the curing process to escape. Compression film may be removed after material hardens and either discarded or left in place.

Prior to Pulling

11



Allow the Wrapid Shield XL to reach a Shore D Hardness of 70 prior to pulling. Wrapid Shield XL is fully cured at a Shore D Hardness of 83 @ 72°F.

Note: If holiday inspection is required it must be done after installation of the corrosion coating product is installed because the holiday detector with jeep on residual moisture in the Wrapid Shield XL installed product.

Storage & Safety Guidelines

To ensure maximum performance, store Canusa products in a dry, ventilated area. Keep products sealed in original cartons and avoid exposure to direct sunlight, rain, snow, dust or other adverse environmental elements. Avoid prolonged storage at temperatures above 35°C (95°F) or below -20°C (-4°F). Product installation should be done in accordance with local health and safety regulations.

These installation instructions are intended as a guide for standard products. Consult your Canusa representative for specific projects or unique applications.

Canusa-CPS
A division of ShawCor Ltd.

Head Office
25 Bethridge Rd.
Toronto, ON M9W 1M7 Canada
Tel: +1 416 743 7111
Fax: +1 416 743 5927

Canada
Suite 3200, 450 - 1st Street S.W.
Calgary, AB T2P 5H1 Canada
Tel: +1 403 218 8207
Fax: +1 403 264 3649

Americas
2408 Timberloch Place, Building C-8
The Woodlands, TX 77380 USA
Tel: +1 281 367 8866
Fax: +1 281 367 4304

Europe, Middle East,
Africa & Russia
Unit 3, Sterling Park,
Gatwick Road, Crawley, West Sussex
RH10 9QT United Kingdom
Tel: +44 1293 541254
Fax: +44 1293 541777

Asia-Pacific
101 Thomson Road,
#11-03 United Square
307591 Singapore
Tel: +65 6749 8918
Fax: +65 6749 8919

Canusa-CPS is registered to ISO 9001:2008

Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the installation guide when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this installation guide is to be used as a guide and is subject to change without notice. This installation guide supersedes all previous installation guides on this product. E&OE

Part No. 99060-228
IG_Wrapid Shield XL_rev010

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A.Y. MCDONALD MFG. COMPANY is the leading manufacturer of Plug and Ball style Gas Meter Shutoff Valves utilized in both residential and commercial applications up to 175 PSIG. A.Y. McDonald offers a variety of Integral Valve and Standard Configuration Meter Bars including single and multiple residential By-Pass Meter Bars and the newly developed Industrial By-Pass Bar. A full line of straight and off-set Meter Swivels, Meter Nuts, and Meter Plugs are also available in black malleable iron or a galvanized finish. 3 Part Unions in ¾" thru 2" diameters are also manufactured in a BMI finish.

BÖHMER
BALL VALVES

BÖHMER is a worldwide leader in the manufacturing of forged, fully welded, trunnion mounted style ball valves for a variety of high pressure field applications. Nearly 60 years of German engineering and design have resulted in a state of the art production facility and one of the highest quality, flange/welded end valves available on the market. Böhmer Valves are available in diameter sizes ranging from 2" thru 56" with ANSI Class 150 to 1500 nominal pressure ratings, and made in accordance with API 6D standards.

CANUSA-CPS
A ShawCor Company

CANUSA-CPS is the global leader in field applied corrosion protection systems. CANUSA Heat-Shrinkable Sleeves include Wraparound and Tubular Sleeve Systems and Tapes. CANUSA also offers HBE-95 Liquid Epoxy Coating for all your field joint coating needs. CANUSA products are also specified for a variety of specialty applications including Directional Drillings, Casings, Bridge Crossings, Water/Wastewater fittings, and elbows. CANUSA also recently developed Wrapid Shield™ PE, a high impact resistant rockshield to protect your corrosion coatings.

CCI PIPELINE SYSTEMS

CCI PIPELINE SYSTEMS specializes in providing a complete line of Casing related products for the Gas, Oil, Water and Wastewater Industries offering Wrap-It Link Seals, High-Density Polyethylene, Carbon or Stainless Steel Casing Spacers, and Neoprene Rubber End Seals for Casing Pipe and Wall Penetration applications.

CHASE
Pipeline Products
Tapecoat® Royston®

CHASE CORPORATION is a leading manufacturer of field applied coatings and tapes for the natural gas, oil, water and wastewater industries. Chase's pipeline coatings division sells the highest quality and well respected brand name products including the Tapecoat ® and Royston ® suite of corrosion protection products. Their extensive product lines include a variety of Cold and Hot Applied Tapes, Sealants, Protective Outerwraps, Liquid Epoxies, Mastics, Petrolatum Wax Tapes and Casing Fill products and services.

CITADEL
TECHNOLOGIES

CITADEL TECHNOLOGIES is the leading developer and only manufacturer of the Diamond Wrap suite of products on the market. The Diamond Wrap HP, Diamond Wrap and Black Diamond systems consist of a 100% Solid Epoxy coupled with a Bi-Directional Carbon Fiber Wrap. Our Carbon Fiber Composite Repair Systems are extremely low profile and unmatched in structural integrity used to completely restore corroded/eroded piping systems to their original MAOP without service interruption.

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PRINCIPAL MANUFACTURERS

Denso

DENSO is an internationally recognized leader in corrosion prevention and sealing systems for new and rehabilitation applications. DENSO developed the original Petrolatum Wax Tape and they have completed successful applications for over 75 years. DENSO's suite of corrosion products include: Petrolatum Wax Tapes for above/below grade applications, fast curing Protal Liquid Epoxies for standard and LOW TEMP applications, Bitumen and Butyl Tape systems, and Sealing/Molding products including their Profiling Mastic for irregular shaped valves and flanged connections.

ERICO

ERICO is the worldwide CP connections leader. ERICO was the first to develop the exothermic welded electrical connections that will never loosen, corrode or increase in resistance. The remotely detonated, CADWELD® PLUS system is the latest advancement in welded connections providing your crews with simple and quick installations from outside the ditch.

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glas mesh co.

GLAS MESH CO. manufacturers and supplies a complete line of Fiberglass Reinforced Plastic (FRP) Corrosion/Abrasion control products for a variety of pipeline applications such as Bridge/Aerial Crossings, Compressor/Pumping Stations, and Meter Set/Station piping applications. Glas Mesh products include the FRP Shields, Spacers, Saddles, Flatties, Casing Insulators, Coated U-Bolts and EPI Seam-Sealer.

LB&A INC.

LB&A manufacturers a variety of Non-Conductive Pipe Rollers, Pipe Hangers, and related support hardware for pipeline Bridge Crossing applications. LB&A's Hangers and related support hardware are available in a variety of corrosion prevention finishes including stainless steel and a proprietary BLUECOAT system. LB&A products have been proven to provide long-term durability, weatherability and performance.

LIBERTY COATING COMPANY

A Liberty Group Company

LIBERTY COATING COMPANY, LLC is the Northeast leader in the application of anti-corrosion coatings for the gas, oil, electric, water and wastewater industries. In addition to our PRITEC® coating system, Liberty applies ID/OD Specialty Paint and Lining Systems and provides Pipe-Type Cable Flaring and Coatings. Liberty Coating is located on 35 acres with Rail and Truck access. Pipe Handling, Cutting, Storage, and Logistical Freight Services are also available.

LIBERTY SALES & DISTRIBUTION

Directional Drilling Coatings

LIBERTY SALES & DISTRIBUTION, LLC offers products from the pipeline industries leading manufacturers of HDD coating systems. These include the liquid epoxy coatings Powercrete J, Powercrete R-95, Denso ARO, Warrior 100, as well as the Canusa DDX heat shrink sleeve system. Liberty Sales readily stocks these coating systems, ensuring quick response and timely delivery.

PRINCIPAL MANUFACTURERS

LIBERTY SALES & DISTRIBUTION

Pipeline Markers

LIBERTY SALES & DISTRIBUTION, LLC can provide you with all your marking needs for both underground and above ground infrastructure. The Liberty Dome Post, Test Station, Vent Casing Post, and Flat Marker Post are all made from impact resistant, UV stable plastics and resins that will provide long term marking protection. They are available in standard lengths and colors.

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LIBERTY SALES & DISTRIBUTION, LLC serves the pipeline industry by distributing a wide selection of pipeline pigging products and accessories. Our pipeline pigging products are available in most sizes for cleaning, swabbing and batching solutions for your pipeline. Whatever the job requires, Liberty Sales can provide the proper pig, pig launcher or pig tracker, each customized to the customers specifications.

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Liberty HD Rockshield®

LIBERTY HD ROCKSHIELD® provides high impact and abrasion resistance to protect all of your underground pipeline infrastructure needs. Made from a random looped, lead free, PVC material, this high-density rockshield will save you money by eliminating the need for select back fill, and provide long term abrasion resistance for the life of the pipeline. We will custom cut most orders to help reduce waste on your project. Liberty Sales and Distribution also provides a variety of lighter weight rockshields to meet all your underground pipeline protection needs.

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MONTI

MONTI TOOLS INC. produces high quality surface preparation tools that provide consistent profile depth for field joints and countless other applications. The Monti Bristle Blaster Kit is available in both electric and pneumatic models with a wide selection of attachments. They are widely used in both shop and field applications and can provide SSPC-SP10 surface cleanliness and anchor profile up to 4.7 mils depending upon the substrate.

SPY PIPELINE INSPECTION COMPANY, LTD

PIPELINE INSPECTION COMPANY produces a host of pipe inspection products including the well known SPY Holiday Detector. Each of the SPY Portable Holiday Detectors offer an indefinite adjustable voltage settings range including the Model 780 (1kV-5kV), Model 785 (1kV-15 kV) and the Model 790 (5 kV-35 kV). The positive ground light and audible alarm features are designed with safety in mind and the rugged ergonomic design and easy installation batteries makes for the most efficient and reliable Jeep on the market.

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PRINCIPAL MANUFACTURERS

TECO AMERICAS

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Explosion Proof & Low Voltage Lighting Specialists
& Industry's Most Complete Line of Deadman Style Remote Controls

WESTERN TECHNOLOGY INC. is the premier manufacturer and supplier of Explosion Proof and Low Voltage Lighting products, serving a variety of industries. The NEW UL Approved, CLASS I DIV I BRICK Light offers brilliant white LED lighting with safety and "kick it tough" durability. The BRICK Light provides superior lighting with minimal heat generation even after hours of operation. Western Technology also provides a complete line of Explosion Proof Products for a variety of applications in hazardous locations.

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WOODARD & CURRAN has successfully served the energy market for over 20 years providing a broad scope of regulatory, environmental, and construction support services with clients specializing in the generation, transmission, distribution, and the storage of energy. Woodard & Curran's experience includes electricity, natural gas, petroleum, nuclear energy, heat/power, and the renewable energy sectors. Typical services include: design engineering, linear project routing and permitting, site evaluations, feasibility studies, regulatory compliance, wetland use and resource permitting, mapping and GIS services.

CONTACT INFORMATION

Corporate Office:

Liberty Sales and Distribution, LLC
2880 Bergey Road, Suite F
Hatfield, PA 19440
Phone: (877) 373-0118
Fax: (888) 850-3787

www.libertysales.net
www.libertyhd.net
www.libertymarkers.net

Tracey Rocchino
Office Manager
Email: trocchino@libertysales.net

Tracy Nixon
Inside Sales Representative
Email: tnixon@libertysales.net

Jenna Rorer
Inside Sales Representative
Email: jrorer@libertysales.net

Regional Offices:

New England Territory
Wally Armstrong
Cell: (978) 815-8336
Email: warmstrong@libertysales.net

Mid Atlantic Territory
George Rocchino
Cell: (267) 767-9423
Email: grocchino@libertysales.net

Southern Territory
Lou Taylor
Cell: (267) 664-8177
Email: ltaylor@libertysales.net

Northern Territory
Shane Quackenbush
Cell: (518) 441-5532
Email: squackenbush@libertysales.net

Outside Sales Consultants:

Mid Atlantic Territory
Chuck Lang IV
Cell: (215) 350-9990
Email: clang4@libertysales.net

New England Territory
John Maher
Cell: (207) 650-5740
Email: jmaher@libertysales.net

CANUSA-CPS
A ShawCor Company

Wrapid Shield™ XL/XL-FC

Fiberglass Mechanical Protection for Field Joints on Directionally Drilled Pipelines

Wrapid Shield™ XL/XL-FC is a fiberglass cloth, preimpregnated with a resin that can be activated by salt or freshwater to coat and protect any diameter of pipe within minutes. The product is formulated to resist shear, impact and abrasion on pipe coating systems above and below ground such as fittings and joints on all mill-coated pipe and as an outer wrap over heat-shrinkable sleeves for added mechanical protection.

Superior Mechanical Protection

- Provides unparalleled protection against impact, indentation, abrasion, punctures and tears that may result from directional drilling, rough handling, native backfills or severe in-service conditions.
- Designed to protect the underlying field joint coating from the effect of forces associated with directional drilling.

Chemical Resistance

- Resistant to corrosive salt water, soil acids, alkalies and salts, common chemicals, chemical vapors, and exposure to outdoor weathering and sunlight.

Long Term Corrosion Protection

- In combination with a heat-shrinkable sleeve the composition of the products is such that they provide an effective barrier to water and oxygen which provides effective corrosion protection and soil stress resistance.

Different Cure Speeds Available

- Wrapid Shield™ XL is available in 2 configurations depending on project or environmental conditions.
- Wrapid Shield™ XL is the standard version and has an application time of 20 minutes at 23°C.
- Wrapid Shield™ XL-FC is a Fast Cure version and has an application time of 5 minutes at 23°C.

Applications

- Oil & Gas
- Onshore Pipelines
- Offshore Pipelines
- Girth-Weld Joints
- Directional Drilling

Wrapid Shield™ XL/XL-FC

Fiberglass Mechanical Protection for Field Joints on Directionally Drilled Pipelines

The product information shown here is intended as a guide for standard products.

Consult your Canusa representative for specific projects or unique applications.

Typical Wrapid Shield™ XL Properties*	Test Method	Typical Values
Cure Time at 23°C**		20 min.
Lap Shear Strength	ASTM D3163	12 Mpa
Density	ASTM D792	1.15 g/cm³
Glass Transition Temperature (DSC)	ASTM D3418	Tg = 175 - 189°C
Tensile Strength	ASTM D638	248 MPa
Hardness	Shore D	80
Dielectric strength	ASTM D149	16 kV/mm
Flexural Strength	ASTM D790	405 MPa
Compressive Strength	ASTM D695	165 MPa
Impact Resistance	ASTM G14/G62 (MOD)	167 J

Typical Wrapid Shield™ XL-FC Properties*	Test Method	Typical Values
Cure Time at 23°C**		5 min.
Density	ASTM D792	1.14 g/cm³
Tensile Strength	ASTM D638	206 MPa
Hardness	Shore D	> 70
Flexural Strength	ASTM D790	372 MPa
Impact Resistance	ASTM G14/G62 (MOD)	167 J

*With an 8 layer system

**Cure times will vary depending on substrate temperature. Please contact your local Canusa office for help in determining which configuration would work best for your project's conditions.

Since 1967, Canusa-CPS has been a leading developer and manufacturer of specialty pipeline coatings for the sealing and corrosion protection of pipeline joints and other substrates. Canusa-CPS high performance products are manufactured to the highest quality standards and are available in a number of configurations to accommodate many specific project applications.

Canusa-CPS
A division of ShawCor Ltd.

Head Office
25 Bethridge Rd.
Toronto, ON M9W 1M7 Canada
Tel: +1 416 743 7111
Fax: +1 416 743 5927

Canada
Suite 3200, 450 - 1st Street S.W.
Calgary, AB T2P 5H1 Canada
Tel: +1 403 218 8207
Fax: +1 403 264 3649

Americas
2408 Timberloch Place, Building C-8
The Woodlands, TX 77380 USA
Tel: +1 281 367 8866
Fax: +1 281 367 4304

Europe, Middle East, Africa & Russia
Unit 3, Sterling Park,
Gatwick Road, Crawley, West Sussex
RH10 9QT United Kingdom
Tel: +44 1293 541254
Fax: +44 1293 541777

Asia-Pacific
101 Thomson Road,
#11-03 United Square
307591 Singapore
Tel: +65 6749 8918
Fax: +65 6749 8919

Canusa-CPS is registered to ISO 9001:2008

Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the product data sheet when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this data sheet is to be used as a guide and is subject to change without notice. This data sheet supersedes all previous data sheets on this product. E&OE

PDS_Wrapid Shield™ XL/XL-FC_rev010

CANUSA-CPS
A ShawCor Company

Pipeline corrosion Protection

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/30/2015

Subject: Adhesion Testing – Field Coating

Directive Number: 2015 - 011

An adhesion test shall be performed on an average of 2% of epoxy coated welds from April 1st through September 30th and 5% of epoxy coated welds from October 1st through March 31st, as well as on a minimum of one coated weld in the string for each HDD installation.

The instructions for completing these tests, "**QA/QC Adhesion Test for Field Applied Coatings (Revision 0),**" is attached to this directive.

Any questions on adhesion should be directed to Christopher LeForce or Eric Curtis.

This directive supercedes directive 2015- 008.

Issued by (print): Christopher LeForce

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

TAB 8

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ☒ PA ☐
(Check appropriate box to indicate corrective or preventive action)

Initiator: K. Oxholm

Corrective Action # 2015-002
or
Preventive Action #

Date: 9/1/15

	Date Due	By/Assigned to	Completed Initials & Date
Investigation		Kristy Oxholm	KHO 12/17/2015
Implementation		Chris LeForce	CAL 12/18/2015
Audit			
CAR/PAR closed			

Description of Issue

Concern was expressed about the use of sand berms/pillows instead of sand bags for pipe support since it was not specifically called out in the technical specifications as an approved method of support and padding.

Work Processes need to be modified or ceased during investigation?: Yes x No ___
If so, specify:

Use of sand berms/pillows was ceased during the investigation.

Approved by: Date: 12/18/2015

Investigation Finding

During investigation, Michels agreed to cease use of the berms/pillows in favor of sand bags.

Regardless of the support material/type, the pipe supports in the length of the trench are only temporary support (to achieve separation of the pipe from rocks or hard bottom in the trench bottom) until the padding/backfill material is placed around and under the area between the supports.

The sand berms/pillows react to the weighted pipe in a similar manner as the padding/backfilled soil that is subsequently installed between these supports, thereby achieving a consistent, continuous, and uniform surface for the pipeline.

The dirt berm/pillow supports are created/installed by the padding/sifting hoes, are much wider than sandbags supports (larger load bearing area), and are free of deleterious materials, rocks, etc. This method is an accepted practice in the pipeline industry.

Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

Recommend the discontinuance of the use of sand berms/pillows, unless it is added to the technical specifications as an approved method of support and padding of the pipe.

Action Taken / Verification

Sand berms/pillows were not approved as an alternative to sand bags for further use. Based on information (attached) that the use of sand berms/pillows is a common industry practice the berms/pillows that are already in place will be left in use.

Any future re-evaluation and follow-up required? Yes ___ No x___
If so, specify:

Verified by: ______________________ Date: ______________

Was action taken effective? ☐ Yes ☐ No If no, new CA/PA number: ________

____

Comments: ______________________________________

From: Shawn Pomerleau <spomerle@michels.us>
Sent: Thursday, December 17, 2015 5:10 PM
To: Kristy Oxholm
Subject: RE: Sand/Earth Berms

Kristy – The sand berm method of temporary pipe support (prior to adding padding material) is a common practice within the pipeline industry. Generally these are installed with the use of a padding bucket which screens/filters the material. As these sand berms are built using native backfill material the pipe is able to settle consistently. I have never heard of, or seen, this method cause adverse conditions to the pipeline. Let me know if you need anything else. I will be glad to help. Thank you.

Shawn Pomerleau | Project Manager

Michels Pipeline Construction
A Division of **MICHELS Corporation**
office: 724.249.2065 | cell: 920.737.4701
spomerle@michels.us | www.michels.us
2155 Park Avenue, Suite 105
Washington, PA 15301

From: Kristy Oxholm [mailto:KOxholm@vermontgas.com]
Sent: Thursday, December 17, 2015 5:00 PM
To: Shawn Pomerleau <spomerle@michels.us>
Subject: Sand/Earth Berms

Good Afternoon,

Have you seen the sand/earth berm (pillow) method of temporary pipe support when installing pipe (prior to backfilling) prior to the VGS installations?

If so, have you ever seen them cause any Conditions Adverse to Quality?

Is this a common practice in the pipeline industry?

Thanks,
Kristy

Building Interstate Natural Gas Transmission Pipelines: A Primer

INGAA FOUNDATION REPORT 2013.01

January 2013

The INGAA Foundation, Inc.

The INGAA Foundation Inc.
20 F Street NW Suite 450
Washington, DC 20001

INGAA Foundation Ad-Hoc Construction Committee

Steering Committee/Working Group:

INGAA Foundation	Rich Hoffmann
Alliance Pipeline	Harold Kraft
Bi-Con Services	Denny Patterson
CenterPoint Energy	Erik Dilts
El Paso	Daniel Martin
El Paso	Mike Morgan
Integrated Pipeline Services	Tom Alexander
Integrated Pipeline Services	John Allcorn
Mears	John Fluharty
TransCanada	Mark Domke
Williams	Mario DiCocco

Significant Contributions:

CenterPoint Energy	Debbie Ristig
Energy Transfer	Eric Amundsen
Energy Transfer	Kirk Peterman
Energy Transfer	Dan Pribble
INGAA Foundation	Kevin Voelkel
Kinder Morgan	Dwayne Burton
Sheehan Pipeline	David Sheehan
Spectra Energy	Joseph Ramsey
Spectra Energy	Andy Drake
Sunland	Craig Meier
Process Performance Improvement Consultants, LLC	John Zurcher
TransCanada	Tracy Schultz

Process Performance Improvement Consultants, LLC	Mark Hereth, Technical Lead and Facilitation

Cover photo courtesy of Alliance Pipeline.

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Appendix C - Guidelines for the Parallel Construction of Pipelines

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[1] See foreword for a description of the process used to determine space requirements.

Foreword

This primer was written to explain how interstate natural gas pipelines are constructed, from the planning stages to completion. The primer is designed to help the reader understand what is done during each step of construction, how it is done, the types of equipment used, and the types of special practices employed in commonly found construction situations.

It also describes practices and methods used to protect workers, ensure safe operation of equipment, respect landowner property, protect the environment and ensure safe installation of the pipeline and appurtenances.

This report is meant to be used by all those interested in pipelines and their construction, including federal agencies, landowners, the public, state and local governments, emergency responders and new employees of pipeline and construction companies.

This primer, which was reviewed by INGAA Foundation member companies, updates previous works produced by the INGAA Foundation.

In particular, the steering committee working group determined nominal technical space requirements discussed in Appendix A. This group also designed the drawings in Appendix B. Project specific circumstances will have a bearing on the workspace proposed by individual pipeline project applicants. When determining nominal workspace requirements, the pipeline company must consider the space needed for the safest construction possible, including personnel safety, staging of pipe and pipeline appurtenances, efficient movement of materials and equipment, as well as diligent management of environmental impacts.

Concrete coating may be used under streams and in wetlands. Weighting is applied to manage buoyancy in special circumstances, such as river and wetland crossings.

Valves and appurtenances are coated with either FBE or coal tar.

The March 2009 QA/QC Workshop mentioned above also identified an opportunity to improve coating practices on the portion of the pipe where girth welds have been made. A group of INGAA Foundation members worked together in 2010 and 2011 to develop guidance for coating applicators and coating inspectors. The group produced a report entitled, Training Guidance for Construction Workers and Inspectors for Welding and Coating, which is available on the INGAA Foundation Web Site. A separate working group of INGAA Foundation members evaluated challenges with applying coatings during construction. The group developed a report entitled, Best Practices in Field Applied Coatings, also available on the INGAA Foundation Web Site.

3.9 Lowering the Pipe into the Trench

Prior to lowering the pipeline, the trench is cleaned of debris and foreign material, and dewatered as necessary. Trench dewatering entails pumping accumulated groundwater or rainwater from the trench to stable upland areas. The work is performed in accordance with applicable local, state and federal permitting requirements, as well as the operator's procedures. In rocky areas, the bottom of the trench is padded with sand, gravel, screened soils, sandbags or support pillows to protect the pipe coating. Topsoil is not used as padding material.

As described above, an inspection of the coating via jeeping is performed to ensure the integrity prior to lowering. Any coating anomalies detected are repaired.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/1/2015

Subject: Construction in Sand Area

Directive Number: 2015 - 005

In 3.5(B) – Bedding and Backfilling of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications: pipe supports shall be installed in all locations prior to backfilling, unless otherwise directed by the Construction Management Team.

This document serves to direct the construction without pipe supports in the sand area from station 240+26 to station 279+75, as the uniform sand in the trench meets requirements for select backfill.

Issued by (print): John Stamatov

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/31/2015

Subject: Backfill Compaction in Typical Cross-Country Areas

Directive Number: 2015 – 006

In 3.5(D)(1) – Bedding and Backfilling of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications, it states that the pipe trench in typical cross-country areas shall be thoroughly compacted by mechanical means to avoid any future trench settlement. In these cross-country areas, the trench can be compacted by mechanical means using an excavator bucket.

Compaction shall occur when there is at least 12" of sand padding and 12" of general backfill above the pipe and at a maximum of 24" lifts thereafter. Final compaction at grade can be completed using either an excavator bucket or the tracks of a piece of excavating equipment.

The use of an excavator for mechanical means of compaction in cross-country areas is typical in transmission line construction.

Issued by (print): Kristy Oxholm (for Christopher LeForce)

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/31/2015

Subject: General Backfill Materials

Directive Number: 2015 – 007

In 2.1(B) – Materials of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications, it states native materials containing no stones or clods larger than 3" in the longest dimension are acceptable for general backfill. This directive will serve as notice that native materials containing no stones or clods larger than 6" in the longest dimension are acceptable for general backfill.

The VGS Operations and Maintenance Manual in the Trenching and Backfilling Procedure allows for this change to the specification and now the two documents will be consistent.

Issued by (print): Kristy Oxholm (for Christopher LeForce)

Signature: KMOxholm

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

TAB 9

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ☒ PA ☐
(Check appropriate box to indicate corrective or preventive action)

Initiator: Christopher LeForce

Corrective Action # 2015-008

or

Date: 7/1/2015

Preventive Action # ____

	Date Due	By/Assigned to	Completed Initials & Date
Investigation	6/18/2015	Christopher LeForce	CAL 12/11/2015
Implementation	9/1/2015	Christopher LeForce	CAL 12/11/2015
Audit			
CAR/PAR closed			

Description of Issue

The horizontal direction drilling (HDD) installation of the 12" transmission line, as part of Phase I of ANGP, under route 2A and the railroad in Essex did not meet the current acceptance criteria, at that time, for installation. The pipe was installed by ECI.

Work Processes need to be modified or ceased during investigation?: Yes ___ No x
If so, specify:

Approved by: ____

Date: 12/11/15

Investigation Finding

When the pipe was first pulled out of the bore hole and inspected, there was coating damage both on a weld and to the pipe. The welds were coated with Powercrete R-95 liquid epoxy and there was damage down to metal on the weld inspected. The coating damage on the pipe went through the abrasion resistant overlay (ARO) and through the fusion bonded epoxy (FBE) to bare metal. Additional pipe was pulled through the hole for inspection, which is allowed by the VGS Operations and Maintenance Manual. An additional 15 feet of pipe was inspected and an additional weld. No coating damage was found on the pipe but there was one small area of coating damage found on the weld, which was down to bare metal.

Vermont Gas

Page 2 of 2

Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

With only one small area having coating damage and the fact that pulling more pipe through the hole could cause more damage because it had been idle for multiple days, VGS decided to look for another method of inspection. It was decided that an above ground indirect corrosion survey would be completed on the pipe.

Action Taken / Verification

See attached

Any future re-evaluation and follow-up required? Yes x__ No ___
If so, specify:

EN's recommendation is to perform a Close-Interval Survey (CIS) within six months of commissioning the system and verify if the pipeline is meeting NACE criteria for cathodic protection. This will be completed in the spring of 2016.

Verified by: ______________________ Date: ______________

Was action taken effective? ☐ Yes ☐ No If no, new CA/PA number: ________

Comments: ____

Attachment to CAR 2015-008
Action Taken / Verification

VGS hired EN Engineering to conduct the indirect inspection of the pipe. EN Engineering provides "comprehensive and dependable engineering, consulting, and automation services to pipeline companies, utilities, and industrial customers." EN Engineering reviewed and revised VGS' Direct Assessment procedure and was hired in 2015 to conduct a direct assessment on multiple sections of pipe in VGS' transmission system. Their credentials are attached.

EN performed a close-interval survey (CIS), a alternating current voltage gradient (ACVG) survey, and a direct current voltage gradient (DCVG) survey on the section of pipe installed by HDD. The ACVG survey found one minor coating defect on the upstream side of the pipe, but the DCVG survey found no indications. EN concluded that its appears "that this segment of pipe could be adequately cathodically protected as long as coating damage does not exist anywhere else along the pipe that would raise the necessary cathodic protection levels" and that "based on the testing, it appears this section of pipe is acceptable." They do indicate that the survey is most effective at depths of less than 20 feet. Although a majority of this section of pipe is greater than 20 feet deep, there is an approximately a 100-foot portion of pipe that was pulled through the entire hole on the lead end at a depth of 20 feet or less. The survey did not find any coating defects on this portion of pipe. A copy of report is attached.

In addition, VGS will be commissioning the cathodic protection (CP) system at the gas-up of the pipeline. This will provide additional protection should any other coating holidays exist on the pipeline.

ENEngineering

Date: 8/19/15

To: Chris LeForce
Vermont Gas Systems
Engineering Manager
CLeForce@vermontgas.com

From: Kristi Sparbanie
T: (630)353-4024
F: (630)353-7777
ksparbanie@engineering.com

Subject: Project # F56637.00: Route 2A/Rail Crossing HDD Coating Investigation Findings

Vermont Gas Systems retained the services of EN Engineering (ENE) to conduct a coating integrity analysis along the Route 2A/Rail Crossing HDD Bore. The testing and analysis was performed to identify any possible coating faults along the 760 foot length of 12" pipe. The pipeline station is approximately 108+00 to 116+00. This is one HDD segment and is part of an approximately 41 mile "Addison Rutland Natural Gas" project. The HDD is located in Essex, Vermont.

The testing was performed and completed on July 16, 2015 by ENE. The testing that was performed included the following:

- Close-Interval Survey (CIS Native) – This survey was performed to acquire the native potential values of the survey section.
- Close-Interval Survey (CIS DC Applied) – This survey was performed by installing a temporary rectifier and ground bed to determine how much current would be needed to protect this section of pipe. Once the temporary system was installed an "On" and "Instant Off" survey was performed.
- Alternating Current Voltage Gradient (ACVG) – This survey was performed to locate any coating holidays along the pipe.
- Direct Current Voltage Gradient (DCVG) – This survey was performed to locate any coating holidays along the pipe. If a coating holiday is located, side-drain readings are taken to calculate the %IR reading to determine the severity of the coating holiday.

All testing that was performed is found to be the most reliable when pipe depths are less than 20 feet deep. For the majority of the 760 foot section of pipe that was tested, the depth of cover was greater than 20 feet with a maximum depth of 55 feet.

Test Results
A native CIS survey of the pipe was performed.

- The survey did not show any moderate or severe anodic or cathodic peaks.
- Most of the native pipe-to-soil potentials ranged from -400mV to -500mV.

An "On" and "Instant Off" CIS survey was performed when a temporary interrupted current source of 10mA was applied to the 760 foot section of pipe to simulate a cathodic protection system.

- The data collected does not indicate the potential for any moderate corrosion activity (Moderate dips: "On" readings more negative than -850mV and "Instant Off" readings more positive than -850mV).
- The data does not indicate the potential for any severe corrosion activity (Severe dips: "On" and "Instant Off" readings more positive than -850mV).
- The data indicated two (2) minor dips in the survey at neat station 3+50 and 5+75.
- The pipeline exhibited rapid polarization from the applied CP current.
- VGS indicated the original design parameters for this pipeline was a 1mA/ft^2 density value and a 95% or better design coating. Based on the design, ENE calculated a current density value of 126mA would need to be applied to represent the origin design parameters.

The ACVG survey performed found one minor coating defect at station 5+95, two feet from the east side of Colchester Rd.

- One (1) minor coating defect was discovered along the 760 foot section of pipe. The coating defect was 42 dBμV.

The DCVG survey performed did not indicate any coating faults.

Analysis

Analysis of the CIS survey data, ACVG, and DCVG indicate that only one (1) minor coating defect was identified along the entire 760 foot HDD bore and there were no moderate or severe anodic or cathodic peaks in the survey data.

The values used for the proposed cathodic protection system were 1 mA/ft2 and a 95% effective coating design basis. Based on this, it would appear that this segment of pipe could be adequately cathodically protected as long as coating damage does not exist anywhere else along the pipe that would raise the necessary cathodic protection levels.

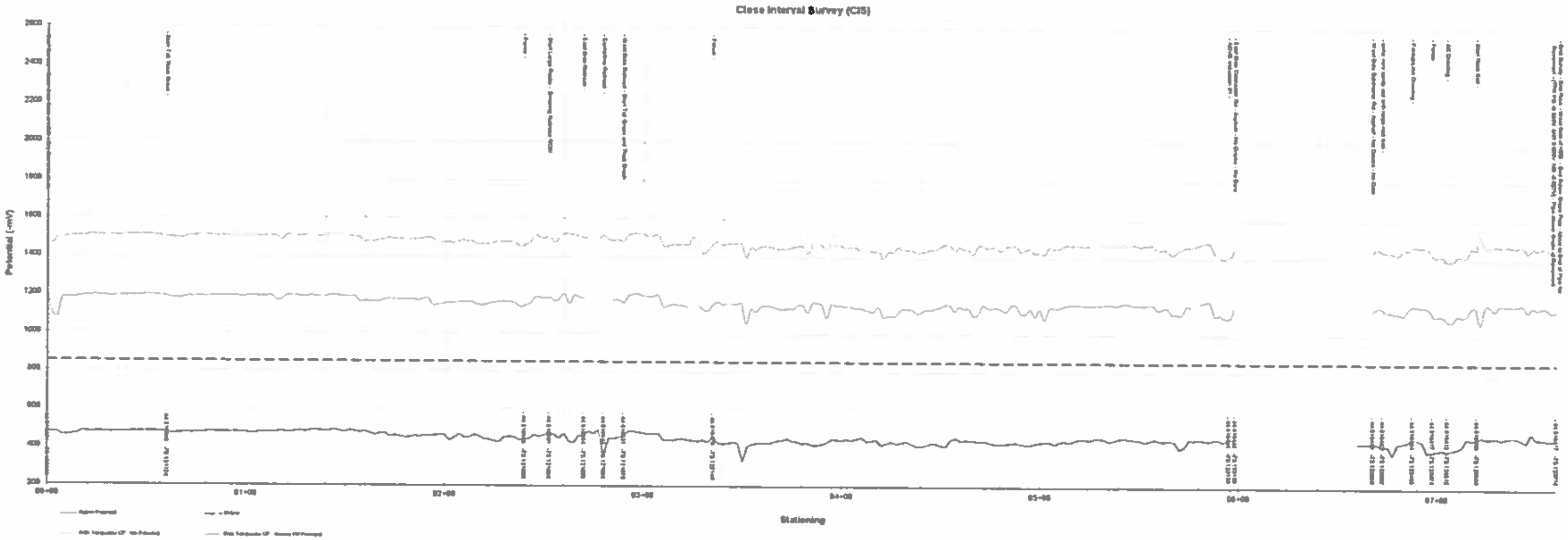
Based on the testing, it appears this section of pipe is acceptable. However, the pipe depth was greater than 20 feet deep and at that depth the surveys performed are not as reliable. It is possible that additional indications exist on this section of pipe, but because of the depth they are not being picked up with the limitations of the equipment. In addition, the surveys performed do not determine if physical damage or wall loss is present in the pipeline steel wall.

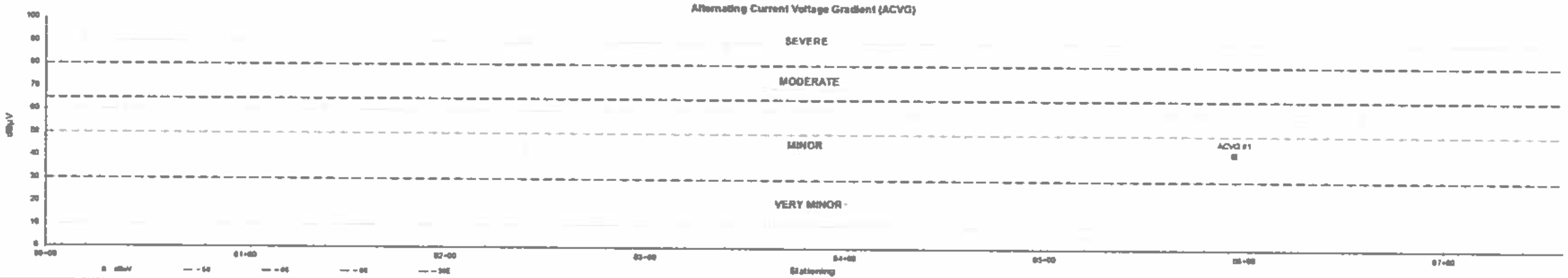
Recommendations

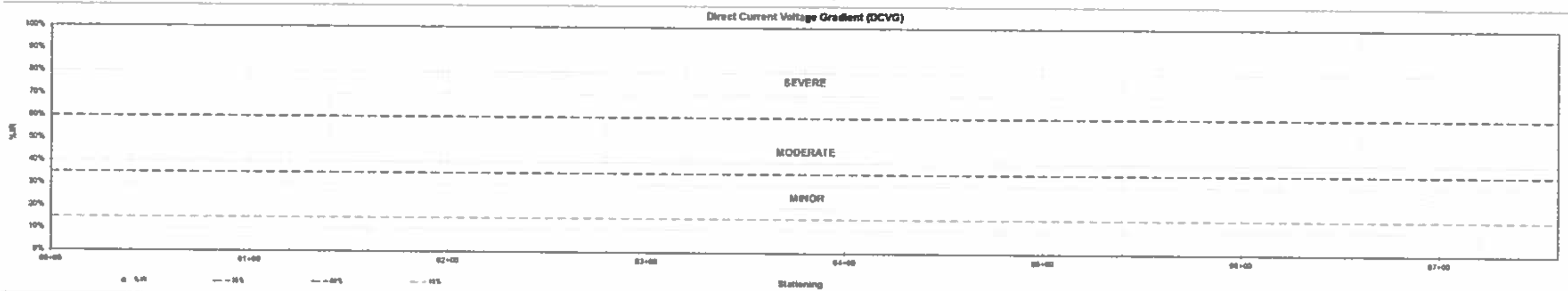
Perform a Close-Interval Survey (CIS) within six months of commissioning the system and verify if the pipeline is meeting NACE criteria for cathodic protection.

Vermont Gas Systems - HDD Assessment

0+00 to 7+60







ENEngineering.

2 November 2015

Vermont Gas Systems, Inc.
85 Swift Street
South Burlington, Vermont 05043

Attention: Kate (Rich) Marcotte
Operations Engineer
kmarcotte@vermontgas.com
802.951.0388 (office)
802.922.3254 (mobile)

Reference: References/Resumes for VGS HDD coating survey

Dear Kate:

I am providing the following information based on your October 14, 2015 request as e-mailed to Alfredo (Fred) Ulanday, Sr. Project Manager (ENE).

To date for Vermont Gas, EN Engineering has only completed the corrosion engineering assessment of two (2) HDD locations on the 41 mile "Addision Rutland Natural Gas" project.

EN Engineering is currently providing a large Midwest natural gas transmission company with HDD corrosion engineering assessments over the past two (2) years. This is being performed on over 40 HDD locations on two (2) active pipeline construction projects. HDD corrosion engineering assessment is the result of an earlier HDD installation where the pipeline was believed damaged during the installation. The process of assessment is now part of contract specifications and consists of the following:

- Perform the following testing at all HDD locations:
    - Close-Interval Survey (Native Readings) – Used to identify any anodic or cathodic peaks
    - Close-Interval Survey ("On" and "Instant Off" survey when current is temporary applied to the pipeline) – Used to identify any anodic or cathodic peaks and if the HDD pipeline segment can be protected with the current design parameters
    - Current Demand Testing – Used to determine if the HDD pipeline segment can protected with the current design parameters
    - ACVG Survey – Used to determine if any coating holidays exist
    - DCVG Survey – Only performing DCVG if the pipeline was too deep and the ACVG equipment could not be used
- The HDD testing is more accurate when the pipe is less than 20 feet deep. The survey can still be performed at depths greater than 20 feet deep, but some of the equipment and/or testing methods might not be as reliable.
- The HDD testing ENE performs does not determine if physical damage or wall loss is present.
- The HDD testing can determine if the pipeline segment can be protected with the proposed design parameters.
- The HDD testing is best performed when the pipeline ends are exposed and not connected to the remainder of the pipeline. The ends should have temporary test leads installed and no drill equipment should remain on the pipe.

A criterion for the confirmation of HDD acceptability from a corrosion engineering perspective is used to clearly define the acceptability of an HDD installation and includes the following:

- Testing results may not be in excess of the following:
    - Any single coating indication greater than 80 dBµ V.
    - More than four (4) coating indications greater than 65 dBµ V but less than or equal to 80 dBµ V per 160-ft of individual HDD installation.
    - Cathodic protection current demand in excess of 2 ma/ft^2 for an assumed 98% effective coating (2% bare); with Close interval survey (CIS)
    - Any single location that cannot be polarized (pipe-to-soil instant off measurement) equal to or more negative than -0.950 Vdc using a protective cathodic protection current as established above.

EN Engineering employees working on this project have included: Adam Gervasio, Ryan McCarthy, Corey Mitchell, Dominic Ciarlette and Kristi Sparbanie.

EN Engineering has been performing this type of testing on various projects over the last thirteen (13) or more years – most significantly with the following companies:

- Valero, Illinois– 60-foot depth HDD installation associated with liquids line from terminal to dock facility

- Enbridge Energy: Line 14 – New Pipeline construction from Construction from Illinois/Wisconsin border to Griffith, Indiana. Corrosion engineering field inspection of all HDD or bore type crossings on Line 14 construction[1]

- Nicor Gas: Multi-year Contract (2001 to 2010) – Various HDD or bore type crossings inspected as part of corrosion control engineering and cathodic assessment projects.

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[1] Line 14 is routed from Superior, Wisconsin to Griffith, Indiana. Corrosion engineering inspection was only performed on the Illinois/Indiana section of the pipeline construction project. No post construction issues were found on this section of pipe; however, many post and significant construction issues, related to corrosion control and cathodic protection, were found on the section of pipeline from Superior, Wisconsin to the Illinois/Wisconsin border.

I wish to thank-you for the opportunity to provide you with this information. Please let Fred or I know if you have any other questions or additional need for information. I can be reached at 630.353.4039.

Sincerely,

David A. Schramm
Vice President
Corrosion Control Engineering
630 353 4039 (Office)
630 353 7777 (Fax)
630 303 1213 (Mobile)
dschramm@enengineering.com

Attachment: Resumes

- A. Gervasio, R. McCarthy, C. Mitchell, D. Ciarlette, K. Sparbanie, D. Schramm

Management-of-Change and Approval Record (MOCAR)

Date	Version	Description	Name
11/02/2015	0.1	FINAL	Ulanday
10/31/2015	0.1	DRAFT	Schramm

Dominic Ciarlette

Design Engineer - Integrity

Key Relevance
MAOP Verification
External/Internal Corrosion Direct Assessment
Corrosion Control Field Assessments

Job Title:
Design Engineer
Integrity

Years with EN Engineering: 1

Total Years of Experience: 1

Primary Office Location:
Warrenville, IL

Education:

- BS, Chemical Engineering, University of Illinois at Chicago

Overview: Mr. Ciarlette is a graduate of University of Illinois at Chicago. Since joining EN Engineering, he has served as a team member for MAOP verification projects, as well as working on other integrity based projects and tasks.

Relevant Projects:

Genesis - MAOP Verification

Alabama Participated in MAOP verification including quality assurance activities to confirm accuracy and completeness. Reviewed and assessed pipeline engineering documents used to validate the pipeline MAOP. Assembled spreadsheets to track pipeline features and examined pipeline specifications and tests to determine safe operating conditions.

Pacific Gas and Electric - MAOP Verification

California Participated in MAOP verification including quality assurance activities to confirm accuracy and completeness. Reviewed and assessed pipeline engineering documents used to validate the pipeline MAOP. Assembled spreadsheets to track pipeline features and examined pipeline specifications and tests to determine safe operating conditions.

DTE - ECDA/ICDA Surveys

Michigan Performed Close Interval Survey (CIS), Alternating Current Voltage Gradient (ACVG), Current Attenuation, Elevation and Depth of Cover Surveys.

MidAmerica Energy - Direct Assessment Surveys

Iowa Performed Close Interval Survey (CIS), Alternating Current Voltage Gradient (ACVG), Current Attenuation, Elevation and Depth of Cover Surveys.

Enbridge – Elevation Surveys

Illinois Performed Elevation and Depth of Cover Surveys for crude oil transmission line.

NIPSCO - MAOP Verification

Indiana Participated in MAOP verification including quality assurance activities to confirm accuracy and completeness. Reviewed and assessed pipeline engineering documents used to validate the pipeline MAOP. Assembled spreadsheets to track pipeline features and examined pipeline specifications and tests to determine safe operating conditions.

Adam Gervasio

Design Engineer - Corrosion

Key Relevance
Corrosion Control Field Assessments
Cathodic Protection Trouble Shooting
Atmospheric Corrosion Inspection
Corrosion Control Field Assessments

Job Title:
Design Engineer
Corrosion

Years with EN Engineering: 2

Total Years of Experience: 3

Primary Office Location:
Warrenville, IL, USA

Education:

- B.S., Civil Engineering, University of Illinois, Chicago, IL.

Professional Certifications:

- Professional Engineer Intern
- OSHA 30 Hour Construction Course
- Cathodic Protection Test (CP1), NACE

Overview: Adam Gervasio has two years experience of project experience in cathodic protection, corrosion control survey. Prior to joining EN Engineering, he worked for Weeks Marine doing heavy marine construction and environmental remediation in addition to interning at TY Lin and Cook County Highway department. He is a Cathodic Protection Tester and has passed the FE Exam.

Relevant Projects:

Cook County Highway Department
Assisted in reviewing permits on behalf of the Transportation and Planning division. Processed and prepared new permit requests on behalf of Permits division. Aided in the development of proposals for RTA/CMAP grants. Evaluated possible solutions for specific problem intersections/traffic related issues. Location: IL

T.Y. Lin International
Worked in a team, met various project deadlines, where I assisted in civil design and drafting work on the proposed Cermak Green Line elevated CTA (rail) station from 30% to bid-set submittals. Including: Removal Plan, Maintenance of Traffic, Proposed Work, Track Design, Grading Plan, Pavement Markings, Existing Conditions, and documentation control. Location: IL.

Weeks Marine
Collected, processed and analyzed hydrographic and beach survey data using electronic data collection instruments (DGPS, digital echo sounder, RTK etc.) and custom software packages. Analyzed daily collected dredge data for projects managers and superintendents to optimize operations efficiency at individual job sites. Responsible for constructing dig patterns using custom software to maximize dig productivity. Led a survey crew in gradation for beach nourishment and disposal areas. Responsible for troubleshooting, functionality and accuracy of all land and water survey equipment. Assisted in the mobilization and demobilization of all projects assigned to. Location: NY, NC, FL, LA

MidAmerican Energy - Cathodic Interval Survey
Operator in a closed interval survey for a 100 mile pipeline along with gathering soil resistivity data along the length of the pipeline. Location: IA

NIPSCO
Performed field inspections in order to determine if pipelines were bare steel along with final analysis and report writing. Testing included PCM attenuation Locations: IN

Zoetis INC.
Performed a leak detection survey in addition to report writing and analysis. Locations: IL

Alliant Energy
Performed cathodic protection testing of the protective coating on all completed horizontal directional drilled (HDD) locations. Field procedures included the following testing to be performed: Alternating Current Voltage Gradient Survey (ACVG), Close-Interval Survey (CIS), and Electrical Conductance Testing at all completed HDD locations. Locations: WI, IA

Relevant Projects (Cont'd)

National Fuel Gas – AC Mitigation Design
Gathered soil resistivity and assessed existing power line systems in the field for proposed 96 mile pipeline. Locations: PA, NY

Key Relevance
Corrosion Control Field Assessments
Cathodic Protection Trouble Shooting
Internal Corrosion

Job Title:
Corrosion Technician
Corrosion

Years with EN Engineering: 2

Total Years of Experience: 2

Primary Office Location:
Warrenville, IL, USA

Education:

- Harper College
- Illinois State University

Professional Certifications:

- Cathodic Protection Tester (CP1), NACE
- NCCER – Pipeline Core 2013

Overview: Mr. McCarthy has over two (2) years of experience in the corrosion industry, focusing primarily on coating, external corrosion and integrity. I became a Cathodic Protection Tester in February 2014.

Relevant Projects:

EN Engineering – Corrosion Technician
Survey and analysis of cathodic protection annual and troubleshooting surveys including CIS, DCVG, ACVG and ICDA. Thermite welding of valve connections. Confined space supervisor and maximum allowed operating pressure (MAOP). Location: IL

Exxon Mobile
Annual cathodic protection survey. Observe and performed pipe to soil readings in gas storage tank in refinery. Troubleshooting shorted wiring to gas tanks. Locations: IL

Nicor - Aux Sable AC Mitigation Design
Field assessed and modeled a proposed 30 mile pipeline in a highly congested ROW corridor. Provided mitigation design and construction support for multiple phases of installation. Location: IL

Genesis
Completed maximum operation pressure forms for Genesis Martinville-Gwinville Junction and Freestate pipeline. Locations: MS

Integrity Solutions - AC Assessment and Design
Provided AC assessment procedures and field guidelines for third party contractors. Evaluated the collected data and modeled 485 miles of a proposed pipeline. Provided AC mitigation design for various locations along the ROW. Locations: WY, MT

Illinois American Water
Confined Space Supervisor. Thermite welding connections at valves. Location: IL

Enbridge – Spearhead line 55
Annual Cathodic protection survey. Pipe to soil readings at test stations, bonds, foreign crossings and valves. Measurements and inspection of rectifiers. Mainline valve inspections. Location: OK, KS, MO, IL

MidAmerican Energy (MEC)
Cathodic protection survey including: AVCG and CIS of Illinois – Iowa gas transmission pipelines. Locations: IL, IA

DTE Energy
Cathodic Protection survey including: ACVG, CIS, IDCA and stationing of Frankfort, Powers-Gladstone, Powers – Iron River, Mackinaw, and Petoskey gas transmissions pipelines. Location: MI

Alliant
HDD survey including: ACVG, DCVG, and CIS of Oakdale and Clarinda gas transmission pipelines. Cathodic protection survey including: CIS of Story County gas transmission pipeline. Location: IA, WI

NIPSCO
Pipe to soil readings at test stations, bonds, foreign crossings, and valves. Measurements and inspection of NIPSCO rectifiers. Soil resistivity of NIPSCO gas transmission pipeline. Bare steel inspection of NIPSCO gas distribution pipeline. Location: IN

Explorer
AC Mitigation survey: Soil resistivity for Explorer gas transmission pipeline. Location: IL

Corey Mitchell

Sr. Design Engineer - Corrosion

Key Relevance
Cathodic Protection Design
Corrosion Control Field Assessments
Cathodic Protection Trouble Shooting
AC Mitigation Design and Analysis
Atmospheric Corrosion Inspection
Internal Corrosion

Job Title:
Sr. Design Engineer
Corrosion

Years with EN Engineering: 3

Total Years of Experience: 3

Primary Office Location:
Warrenville, IL, USA

Education:

- B.S., Civil Engineering, Southern Illinois University, Carbondale, IL

Professional Certifications:

- Cathodic Protection Test (CP1), NACE
- Cathodic Protection Technician (CP2), NACE

Overview: Mr. Mitchell is an engineer with three (3) years of project experience in cathodic protection, corrosion control survey and inspection. Work on a vast array of different and unique projects provides Mr. Mitchell with an excellent background in pipeline corrosion control and integrity field services within the: oil, gas, and water transmission and distribution arena. Mr. Mitchell is proficient in the entire external corrosion direct assessment (ECDA) and internal corrosion direct assessment (ICDA) process including the performance of:

- Close-interval survey (CIS),
- Direct current voltage gradient (DCVG),
- Alternating current voltage gradient (ACVG),
- Current attenuation (PCM), and
- Pipeline profile surveys.
- ICDA Dig Assessment
- ECDA Dig Assessment

Relevant Projects:

Pacific Gas and Electric (PG&E)
MAOP Verification: Reviewed and evaluated historical pipeline engineering documents to determine the current pipeline MAOP as determined by PHMSA requirement 49 CFR Part 192 – Subparts J & L. Assembled spreadsheets to track pipeline characteristics and examined pipeline specifications and tests to determine operating safety of existing pipeline. Performed Quality Control of team of 7 engineers to ensure an accurate and uniform deliverable. Location: CA

Enbridge
Foreign Operations: Performed a review of foreign operations for Enbridge's proposed pipeline and contacted each foreign operator to schedule and compile encroachment agreements between companies. CP Construction: Contributed as part of a team in the design of a cathodic protection system of a new 600 mile pipeline. Collected field data at key locations along proposed route required for CP design and coordinated any/all foreign operations that took place along ROW. Responsible for providing construction oversight for 150+ miles during installation of cathodic protection test stations, ground-beds, and rectifiers. Affectively communicated with a multitude of construction crews throughout the installation process to ensure a quality product be delivered to the client. Annual / Exceptions Report: Organized and reviewed data collected during annual surveys along several Enbridge pipelines throughout the Midwest. Compiled and prepared annual reports for both D.O.T. and Enbridge field personnel detailing any non-compliance issues found during the survey. Locations: IL, MO, KS, OK

Relevant Projects: (Cont'd)

Blue Racer
Impressed Current Cathodic Protection Design: Collected soil resistivity along ROW and designed a cathodic protection system for twenty-eight (28) miles of parallel 10" and 8" pipelines located within the state of Ohio. Provided a review of existing CP test stations with recommendations, Impressed Current Protection Design, CP typicals for construction, BOM for CP design, and a CP design report to the client. Galvanic Cathodic Protection Design: Collected soil resistivity along ROW and designed a cathodic protection system for 2.77 miles of 12" pipe located within the state of Ohio. Provided an AC threat assessment, Galvanic Cathodic Protection Design, CP typicals for construction, BOM for CP design, and a CP design report to the client. Location: OH

DTE
ECDA / ICDA Survey: Performed Close Interval Survey (CIS), Alternating Current Voltage Gradient (ACVG), Current Attenuation, Elevation and Depth of Cover Surveys as well as collected soil resistivity data. Prepared indirect examination, direct examination, and post-assessment reports. Locations: MI

MidAmerican Energy (MEC)
CIS Survey: Performed Close Interval Survey (CIS) along 100+ miles of pipeline throughout the state of Iowa. Lead and trained a crew to perform the necessary duties to collect the necessary data to complete the project affectively. Collected soil resistivity readings at half mile intervals along all surveyed pipelines. Lead data and equipment management throughout the project to ensure a quality product would be delivered to the client. Locations: IA

CF Industries
Responsible for providing construction oversight for of cathodic protection facilities: such as anodes, test stations, insulating flanges, and Dairyland devices. Performed data collection and baseline readings at new cathodic protection test stations. Affectively communicated with a multitude of construction crews throughout the installation process to ensure a quality product be delivered to the client. Locations: IA

Alliant
Performed cathodic protection testing of the protective coating on all completed horizontal directional drilled (HDD) locations. Field procedures included the following testing to be performed: Alternating Current Voltage Gradient Survey (ACVG), Close-Interval Survey (CIS), and Electrical Conductance Testing at all completed HDD locations. Locations: WI

Enbridge Tank Farm
Contributed as part of a team in the design of a cathodic protection system for a 1000 feet of new 30" pipe and the cabling to oil storage tank bottom. Assisted with the following throughout the project: Validate the design adequacy of the distributed anode system to the protect the pipeline and tank bottom, design proper isolation of the pipeline from other entities, prepare construction level drawings for the anodes, cabling, coupons, reference cells, and bond boxes for the project, and provide construction level oversight to ensure the design is followed during the installation. Locations: IL

Relevant Projects: (Cont'd)

NIPSCO AC Design
Performed an evaluation of AC levels on a 6" and 4" pipeline collocated with overhead high voltage AC distribution and transmission towers: Data review and field data collection, AC threat assessment, and AC mitigation modeling and design. Locations: IL

WE Energies
ECDA Survey: Performed Close Interval Survey (CIS), Alternating Current Voltage Gradient (ACVG), Direct Current Voltage Gradient (DCVG), and Current Attenuation Surveys as well as collected soil resistivity data. Prepared indirect examination, direct examination, and post-assessment reports. Locations: WI

Vermont Gas
ECDA / ICDA Survey along High Consequential Areas (HCA): Performed Close Interval Survey (CIS), Alternating Current Voltage Gradient (ACVG), Current Attenuation, Elevation and Depth of Cover Surveys as well as collected soil resistivity data. Performed data analysis and recommended dig locations. Performed direct examinations for all ICDA and ECDA digs along the HCA's. Prepared indirect examination, direct examination, and post-assessment reports. Performed cathodic protection testing of the protective coating on all completed horizontal directional drilled (HDD) locations. Field procedures included the following testing to be performed: Alternating Current Voltage Gradient Survey (ACVG), Close-Interval Survey (CIS), and Electrical Conductance Testing at all completed HDD locations Locations: VT

David A. Schramm

Vice-President and Senior Project Manager – Corrosion Engineering

Key Relevance
SME - Cathodic Protection Design
SME – HVDC and Pipeline Conflicts (Stray Current)
SME - Corrosion Control Field Assessments
SME - Cathodic Protection Trouble Shooting
SME - AC Mitigation Design and Analysis
SME -Atmospheric Corrosion Inspection
SME -Internal Corrosion
SME – Wall Loss Assessment (Corrosion)
SME – Coating Selection and Condition Assessment
Operator Qualification Program Management and Assessment
Corrosion Education and Training

Job Title:
Vice-President/Senior Project Manager – Corrosion Engineering

Years with EN Engineering:
13+

Total Years of Experience:
35

Primary Office Location:
Warrenville, IL, USA

Education:

B.S., Forestry: Resource Management, Iowa State University, Ames, Iowa

B.S., Integrated Pest Management (Entomology, Pathology and Dendrology), Iowa State University, Ames, Iowa

Overview: Mr. Schramm has over thirty-five (35) years of extensive experience in the direct and practical application of corrosion control methods, cathodic protection assessment and design, and system integrity management and field services.

Direct experience with external, internal, and atmospheric corrosion control on natural gas and liquid transmission and distribution pipeline systems, under-ground natural gas storage, under-ground storage tanks, above-grade storage tanks, power plant structures, condenser/chiller/heat exchange equipment, production and injection/withdrawal wells, lead sheath cable, underground electric cable, water transmission systems, and fresh-water marine structures

Responsible for the technical performance, quality, and operation service offerings that provide:

- Corrosion engineering analysis and design
- Cathodic protection monitoring and assessment
- Process control and measurement
- Correlation of internal "smart" tool to indirection inspection survey data
- Cathodic protection design, installation and maintenance
- AC safety and AC corrosion assessment, modeling, and mitigative design
- Computerized close interval potential survey
- Direct current and alternating current voltage gradient survey
- Stray DC interference and telluric current monitoring, measurement, and mitigation
- Coating selection and inspection
- Material selection, specification and procurement
- Technical specification and procedure
- OQ qualification and training
- Corrosion related field failure, wall loss assessment, and remaining strength evaluation
- Indirect and direct inspection program support
- Field installation oversight and inspection
- Project management and commission services
- Operational support including:
    - Leak detection
    - Purge operations
    - Watch and protect and rights-of-way inspection
    - Locating
    - High Consequence Assessment and Class Survey

Professional Certifications:

- NACE Institute No. 3178 Certified Cathodic Protection Specialist
- NACE Institute No. 3178 Certified Corrosion Technologist

Professional Organizations & Affiliations:

NACE International Institute (NII)

- Board of Directors – (2012-2016)
- Chairman, Certification Committee (2012-2016)
- Audit Committee (Board) 2015-2016)

NACE International (NACE)

- Professional Activities Director (PDAC) (Board) (2011 to 2014)
- Audit Committee (Board) (2011 to 2014)
- Professional Activities (PDAC) Chair (2011 to 2014)
- Professional Activities (PDAC) Vice-Chair (2008 to 2011)
- Certification Committee Chair (2003 to 2006)
- Certification Committee Vice-Chair (2000 to 2002)
- T-10A-11: Gas Distribution Industry Corrosion Problems Chair (1997 to 2001)
- T-10A-11: Gas Distribution Industry Corrosion Problems Vice-Chair (1995 to 1997)
- SME Department of Defense (DoD) Panel on Training and Certification
- CP Interference Course Development Task Group: Cathodic Protection Interference (2006)
- Cathodic Protection Sub-Committee: Cathodic Protection Technologist (2004)
- Cathodic Protection Training and Certification Program Task Group: Cathodic Protection Level 1 (2000) and Cathodic Protection Level 2 (2000)
- Chicago Section Membership Chairman (1986-1987)

Corporate program support:

- ENE Health, Safety, and Environmental Committee – member
- OSHA Safety Training Programs
    - Development and documentation of program safety documents.
    - Initial creation and training of Level 0 OSHA training presentations (PowerPoint)
- Vision Accounting and Project Documentation:
    - Part of management team charged with the development of project management and project set-up (2014/2015) Vision EWMS project.
    - Developed IN proposal documentation and procedures under Opportunity section of Vision
    - Automation of reports and training of Vision to departmental Project Mangers
    - EMWS Super User
- Operator Qualification and Safety Records
    - Administrator for ISNETWORLD software and NCCER program audit and oversight.
    - Initial development and submittal of safety programs for RAV review
    - Initial support for Client response and safety program update.
    - Set-up and established support for Veriforce OQ programs.
- ISO 9001: 2000 Certification
    - Part of team tasked with the initial development and completion of ISO 9001 policy and procedures within EN Engineering; leading to, ISO9001: 2000 certification for the corporate office.

Relevant Projects:

Tallgrass Development

Provide subject matter expertise (SME) related to conflict between proposed HVDC system and large diameter, high pressure natural gas pipeline in the State of Illinois.

Whiting Petroleum Corporation

Provide professional subject matter expertise (SME) of a test installation of nine (9) deep anode cathodic protection systems installed to provide protection to directionally drilled production wellhead systems in the State of North Dakota. Data review and professional opinion of deep anode design, cement log, and cathodic protection profile (CPP) tool run data. Project deliverables included a professional opinion report and a technical presentation on results.

Professional Organizations & Affiliations:

- Cathodic Protection Task Group: Cathodic Protection Training Program (1999 – 2000)
- Chicago Section – Special Events Chairman (1985-1986)
- Chicago Section – Membership
- Chicago Regional Committee on Underground Corrosion (CRCUC) Chair and Vice-Chair
- Michigan Electrolysis Committee Chair and Vice-Chair

National Center for Construction Education and Research (NCCER)

- Certified Master Trainer (2010)
- Certified Administrator (2010)
- Certified Craft Trainer/Evaluator: Core Curricula, Gas Pipeline Operations, Liquid Pipeline Control Center Operations, Liquid Pipeline Field Operations, Pipeline Core, Pipeline Corrosion Control, Pipeline Electrical and Instrumentation (E&I), Pipeline Maintenance, Pipeline Mechanical, Specialty Craft

Veriforce

- Authorized Evaluator

Midwest Energy Association (MEA)

- Administrator

The Society for Protective Coatings (SSPC)

- Member

Industry Participation:

- API 1161 – Task Group on Operator Qualification, Pipeline Segment – Resolution of Appreciation for contributions to the Task Group
- OSHA 510 Certified "Occupational Safety & Health Standards for the Construction Industry"
- Quality Awareness Training (Nicor Gas- 1993)
- Basic Corrosion Course (NACE-1983)

Tallgrass Development

SME project direction related to excavation analysis of coating and pipeline wall assessment and conductance, evaluation, and assessment if in-situ pipeline coating assessment to TMO102-2002 Standards. Direct analysis of data obtained from field and laboratory testing, written report and recommendations.

Valero Energy Corporation

SME project direction for AC Threat Assessment on 150-mile pipeline as an "active" high level management approach to evaluate both present "threat area" and future AC "threat" risk. Project included the gathering of AC voltages on the pipeline and soil resistivity at intervals not exceeding 1000-ft. AC Threat calculation, research and inclusion of historic data obtained from other sources (DFOS), generation of plots and graphs, scenario or sensitivity analysis, report, observations and recommendations.

Southern Star Gas Central

SME project support for 20-inch diameter natural gas pipeline damaged by 12kV AC power line arc near Joplin, Missouri including: assessment of condition, documentation of event, wall loss discovery, assessment and written report, and Client support with regulatory oversight and questions

Exxon Mobil Refinery

SME technical project support assessment of condition (cathodic protection systems), annual survey, remediation, and recommendation.

United States Gypsum

Develop, perform training, assessment and evaluation for operator qualification of Client employee resources, assess natural gas pipeline system and plant facilities, and develop initial pipeline normal operation system drawing format.

United States Gypsum

SME level support for isolation flange failure in Washington, PA including: assessment of condition, purge out of product, oversight of repairs, purge in of product, and restoration of service.

Industry Participation:

- TWIC (Transportation Workers Identification Credential)
- Clockspring Trainer/Installer Certified (2002)
- Administration Training: Assessor Training (Nicor Gas-1994)
- Goodall Rectifier School: Goodall Electric, Inc. (1982 –
- Managing Cultural Diversity (Coleman Management Consultants (1994)
- Control, West Virginia, University (1985)
- Corrosion Prevention by Cathodic Protection (NACE– 1983)
- Effective Business Communication (IWCC – 1990)
- Appalachian Underground Course: Advanced Corrosion

Expert Witness Testimony:

- South Dakota Public Utility Commission - Testimony
    - Keystone Pipeline, October 2007- Corrosion and Protective Coating Sections and Related Code
    - Keystone XL, September 2009 – Corrosion and Protective Coating Sections and Related Code
    - Keystone XL, March-July-September, 2015 – Corrosion Protective Coating Sections and Related Code
- State of Iowa Utilities Board
    - 2002, Testimony related to AC Interference, assessment, and mitigation as it relates to: proposed pipeline construction beneath overhead AC transmission systems, Iowa.
- Illinois Commerce Commission
    - 2015, Expert Witness Testimony related to impact of proposed HVDC system on large diameter, high pressure natural gas pipeline system in Illinois

Corrosion Control Operations

Managed and directed the Corrosion Control Service Group for Nicor Technologies and Nicor Gas providing corrosion control consulting services to distribution and transmission pipelines, municipal and utility organizations, and commercial and industrial customers. Responsible for the performance of all operating corrosion control programs (internal, external and atmospheric) on the Nicor Gas pipeline system including specification, performance and day-to-day operation. As a member of the Nicor Gas welding and joining, system integrity, and code committee operating task groups provided technical expertise in pipeline integrity, research and testing, corrosion control and cathodic protection issues. Having responsibility for the due diligence corrosion control and cathodic protection evaluations on acquisition projects in Argentina and Tennessee. Developed risk, quality, and integrity management programs related to corrosion control and cathodic protection operations. Location: IL

Corrosion Control Services

Directed and coordinated the Nicor Gas corrosion control programs for distribution, transmission, and storage facilities. Directly supervision responsibility for the completion of annual corrosion control and corrosion control activities which include: annual reading programs, close interval survey, stray current interference, and impressed current rectifier system replacement.

Research Services

Managed and directed the research lab for Nicor Gas and was responsible for day-to-day operation, quality performance, testing, recommendation and approval, including the performance and analysis ASTM and ANSI test standards and methods. Directly responsible for the purge routine process for all large-diameter high- pressure pipelines. Conducted, analyzed and developed corrosion control action and recommendation for all wall loss and field failure events. Locations: IL

Lakehead Pipeline Company

Directed the completion of all annual cathodic protection reading programs, close interval survey, stray current interference, impressed current rectifier system replacement, and field failure investigations for the Lakehead Pipe Line Company over a six (6) year period on facilities that include pipeline, compression, substation, and storage facilities. Locations: ND, MN, WI, IL, MI, NY.

Technical Presentations:

- Whiting Petroleum Corporation September 2015 presentation on Cathodic Protection of Wellhead Structures
- NACE International – Rocky Mountain Section Meeting, September 2015 presentation on AC Interference and Mitigation.
- Columbia Gas, Virginia – Technical presentation on AC Interference and Mitigation and CIS/ACVG/DCVG Data Interpretation, September, 2015
- Baltimore Gas and Electric (BGE), September, 2015 – Technical Presentation on
- Baltimore-Washington Corrosion Committee (BWCC) – Technical Presentation on AC Interference and Mitigation- May, 2015
- PG&E – February, 2015 Technical Presentation on AC Interference and Mitigation
- NACE International, January-2015 Northern Plains Corrosion Control Short Course, Omaha, Nebraska – Speaker and presentation on AC interference and Mitigation and case examples
- USG – January, 2015 – Technical Presentation on Plant Audit Inspections
- NACE San Antonio Section Meeting, May-2014 – Speaker and presentation on AC interference and mitigation and case examples
- NACE International, January-2014 Plains Short Course (Omaha), Nebraska – Speaker and presentation on AC interference and Mitigation and case example
- NACE Wisconsin Short Course, September, 2013 – Cathodic Protection Design and Practical
- NACE Wisconsin Short Course, September, 2013 – Casings: Design and Regulations
- NACE International, August – 2013 Central Area Conference, Little Rock – Speaker and presentation on AC interference and Mitigation and case example.

Portal Pipeline Company

Supervised and completed the annual cathodic protection reading program for the Portal Pipe Line Company including pipeline, gathering and wellhead systems. Location: ND

Alyeska Pipeline Service Company

In-state direction, supervision and related to the process of conducting, analyzing and performing telluric based close interval surveys for the Trans-Alaska Pipeline System (TAPS) over a four (4) year period. Direct responsible for the performance, provision, data quality, data analysis and report recommendations. Location: AK

Desert Generation and Transmission Company

Supervised, conducted and performed the design and testing services for the Deseret Generation and Transmission Company. Planned and performed a wide variety of duties involving the evaluation, design, and installation of cathodic protection systems to inhibit corrosion on pipelines, tanks, and similar underground and submerged structures including electrical continuity and protection of concrete steel cylinder pipe. Locations: UT

Mobil Oil

Conducted and analyzed all underground facilities for the potential application of cathodic protection for the Mobil-Joliet Refinery. Operational and performance responsibilities related to installation of new and existing cathodic protection systems: design, redesign, and installation of impressed current systems for tank bottoms. Location: IL

Montana Power

Conducted, analyzed and performed close interval and leak detection surveys on large diameter - high pressure – natural gas transmission pipelines owned and operated by Montana Power near Helena, Montana. Location: MT

Northern Natural Gas

Conducted, analyzed and performed close interval surveys on large diameter - high pressure – natural gas transmission pipelines owned and operated by Northern Natural Gas (NNG) in the Upper Peninsula of Michigan. Location: MI

Mountain Bell Telephone

Supervised, conducted, analyzed and performed the corrosion control and cathodic protection analysis of the Mountain Bell Telephone lead sheath cable running between Evanston and Cheyenne. Locations: WY

Technical Presentations:

- Northern Natural Gas (NNG) Spring Corrosion Round Table – 2013: AC Interference and Mitigation Training (Minneapolis, Des Moines, El Paso)
- Northern Natural Gas (NNG) Spring Corrosion Round Table – 2013: CIS/ECDA Defect and Interpretation
- AGA/SPE, March 2012 – Identification and Prevention of Corrosion in Gas Storage Gathering Facilities
- NACE Wisconsin Section – Annual Short Course – 2013: Speaker and presentation on Cathodic Protection Design and Practical's and Casings: Design and Regulations
- NACE Wisconsin Section – 2012: Speaker and presentation on AC interference and Mitigation and a case example related to a 12-inch and 20-inch pipeline system.
- 51st. Annual Underground Corrosion Short Course: Speaker and presentation on AC issues on Pipelines presented under the System Integrity section, Purdue University, 2012
- 51st. Annual Underground Corrosion Short Course: Pipeline Casing Presentation, 2012
- 51st. Annual Underground Corrosion Short Course: Station Assessment Procedures, 2012
- EPRI/Southwest Research: June 2010, Copper Grounding Presentation
- China International Oil and Gas Pipeline Conference, Langfang, Hebel, China, November-2009: Safety and Operability Assessment Report and HAZOP Study Report (PetroChina),
- China International Oil and Gas Pipeline Conference, Langfang, Hebel, China, November-2009: ECDA Implementation Case Study – Pipeline Integrity and Corrosion Control Technology
- NACE International, March, 1991 – The Development and Conversion to an "On-line" Corrosion Control Records System on a Mainframe Computer, Corrosion 91, Paper Number 346, NACE International.

Coffeen Power Plant
Supervised, conducted, analyzed, designed and installed cathodic protection systems for the Coffeen Power Plant Facilities operated by the Central Illinois Light Company (CILCO). Location: IL

LaGrange Hospital
Designed, analyzed and supervised the installation of galvanic anode systems designed to protect the interior water box of condenser/chiller units operated by the LaGrange Hospital. Location: IL

Union 76
Supervised, conducted and analyzed the cathodic protection systems installed on over 250 underground gasoline and waste oil storage tanks systems owned and operated by Union 76. Locations: IL, KY, IN

O'Hare Airport
Designed and supervised the installation of galvanic anode protection systems for aviation fuel pipelines related to jet-way expansions. Responsible for the cathodic protection assessment, design, and mitigation on jet-way expansions of the G & H terminals as well as field supervision on the United Airlines terminal 1 construction project. Locations: IL

City of Viburnum
Designed and supervised the installation of down-hole impressed current systems for the City of Viburnum including the protection of water well casing, column and bowls. Location: MO

Kristi Sparbanie

Sr. Project Engineer, Corrosion

Key Relevance
Cathodic Protection Design
Corrosion Control Field Assessments
Cathodic Protection Trouble Shooting
AC Mitigation Design and Analysis
Atmiospheric Corrosion Inspection
Internal Corrosion

Job Title:
Sr. Project Engineer
Corrosion

Years with EN Engineering: 12

Total Years of Experience: 12

Primary Office Location:
Warrenville, IL, USA

Education:

B.S., Mechanical Engineering, Northern Illinois University, DeKalb, IL.

Professional Certifications:

- Cathodic Protection Tester (CP1), NACE
- Cathodic Protection Technician (CP2), NACE
- National Center for Construction Education and Research (NCCER)
- Fundamentals of Engineering Exam (FE), State of Illinois

Overview: Ms. Sparbanie is an engineer with experience in cathodic protection, corrosion control surveys, design, and maintenance of natural gas and water distribution and transmission mains. She has experience in performing close-interval (CIS) and DCVG surveys, cathodic protection annual surveys, stray current interference, analyzing and reporting data, performing External Corrosion Direct Assessments (ECDA), and cathodic protection design of pipelines and stations; such as, galvanic or impressed current systems, calculating anode design life, procurement of materials, and installing CP facilities for monitoring.

Additional designs have been performed for distribution and transmission pipelines and stations which include utilization of sizing programs for regulators, designing heaters and odorizers for customer operating stations, cost estimation and analysis, preparation of bid documents, analysis of public improvement project designs for conflict with gas piping, conflict resolution and reduction, new product testing to determine applicability for field application and standard criteria with reliability testing, cost analysis, and development of customer specifications.

Relevant Projects:

Pacific gas and Electric (PG&E)

Reviewed and assessed historical pipeline engineering documents used to validate the pipeline MAOP as determined by PHMSA requirement 49 CFR Part 192 – Subparts J & L. Assembled spreadsheets to track pipeline characteristics and examined pipeline specifications and tests to determine safe pipeline operations. Verified spreadsheets as part of the quality control team to ensure accuracy and completeness of the final product being delivered. Location: IL

DuPage Water

Performed testing and analysis of structure-to-electrolyte readings, AC readings, bond readings, isolation flanges, pipeline continuity, panhandle eastern (casing) testing, close-interval surveys (CIS), DCVG and ACVG Surveys, and static and dynamic stray current interference which included system wide testing. Analyzed cathodic protection pipeline systems and back-up generation stations, prepared construction drawings for galvanic and impressed current designs and monitoring facilities, and procurement of materials. Location: IL

Kern River

Performed an interference assessment and design on a 30" and 36" pipeline in Wyoming. Reviewed historical data and assessed data to provide a stray current mitigation design that involved installing DC coupon test stations and two galvanic anode systems. Location: IL

Illinois American Water

Performed testing, analysis, and design for steel, PCCP, and ductile iron pipelines which included baseline and annual surveys, AC study, test stations and CP monitoring facilities, air release locations, stray current interference, zinc grounding mats, and CP design. Field testing included structure-to-electrolyte readings, AC potentials, isolation and continuity testing, stray current interference testing, recording data from line current test stations to determine the calibration factor, and installing temporary data loggers to monitor the AC and DC readings over time. Location: IL

United States Gypsum

Performed an External Corrosion Direct Assessment (ECDA) on various pipeline segments which included pre-assessment and indirect inspection phases. Field work performed consisted of close-interval surveys (CIS), DCVG surveys, interference testing, isolation testing, and depth of cover surveys. Locations: TN and AL

Northwestern Suburban Municipal Joint Action Water Agency (NSMJAWA)
Annual testing of different line segments to determine structure-to-electrolyte readings, AC readings, and isolation at each test station. Performed close-interval surveys (CIS), stray current interference testing, and analyzed and provided recommendations based on the data obtained. Location: IL

Louisville Gas and Electric (LG&E)
Designed a cathodic protection system for an 8.1 mile 20" diameter pipeline in Kentucky which included two stations and a section of pipeline installed in rock. Utilized design calculations to determine rectifier size, anode type and amount, and cable lengths and sizes. Monitoring facilities including foreign pipeline test stations, AC coupon test stations, anode test stations for galvanic anodes protecting piping inside stations, isolation test stations, and permanent gradient control mats for AC safety. Assisted in the AC assessment and AC design for the HVAC. Location: IL

Alliant Energy
Designed a cathodic protection system for a 13.31 mile 20" diameter pipeline in Iowa which included an Interconnect and a Gas Yard Station and a 12.76 mile 12" diameter pipeline in Iowa which included an Interconnect and a Regulator Station. Utilized design calculations to determine rectifier size, anode type and amount, and cable lengths and sizes. Location: IL

DTE Energy
Assisted in training and performing the close-interval (CIS) and DCVG surveys for the External Corrosion Direct Assessment (ECDA) on several sections of main. Location: MI

Nicor Gas
Designed cathodic protection systems on distribution and transmission work orders and performed close-interval (CIS) and DCVG surveys on Nicor Gas pipelines. Designed stations which included odorant and storage tanks, meter sets, sizing regulators, procurement of material, and estimation of cost. Analyzed and determine extents of main to be replaced for public improvements involving the replacement of cast iron, steel, or P.E. main. Location: IL

Enbridge Pipeline
Performed annual potential reads on various line segments, performed close-interval survey (CIS), and designed impressed current systems for several locations in Minnesota. Locations: IL, WI, and MI

Valero
Performed close-interval surveys (CIS), stray current interference testing, and analyzed and provided recommendations based on the data obtained. Location: IL

Vectren

Modified Gas and Liquid IMP procedures and forms. Assisted in the study and design of an AC system. Location: IL

Citgo Refinery
Designed 2,275' of 8" main to run along New Avenue and 135th Street for the new hydrogen plant for CITGO. Analysis was performed to determine the minimum radius of curvature and the operational stresses on the 8" main crossing the railroad at an approximate depth of 20'. In addition, a new meter station was proposed that included a 6" meter set and 4" Mooney regulators. Location: IL

Adkin's Energy
Designed a station for the new plant for Adkin's Energy that included a 500,000 Btu/hr heater, a meter set with a 4" turbine meter, and a dual regulator run with 3" Mooney regulators and 6" ball valves. In addition, an 8" fuel line was run for about 1,140' up to the Adkin's energy building where another dual regulator run was designed to cut the pressure down. Location: IL

TAB 10

Vermont Gas

2015 ANGP Project Directive Log

Number	Date	Subject	Issued By	Disposition*
2015-001	8/24/15	Reporting Potential Vandalism	John Stamatov	
2015-002	8/24/15	Welding Line Up Clamp Usage Clarification	Chris LeForce	Superseded by 2015-004
2015-003	8/24/15	CP Test Stations for the first 11 miles	Chris LeForce	
2015-004	8/28/15	Welding Line Up Clamp Usage Clarification	Chris LeForce	Replaces 2015-002
2015-005	9/1/15	Construction in Sand Area	John Stamatov	
2015-006	8/31/15	Backfill Compaction	Kristy Oxholm on behalf of Chris LeForce	
2015-007	8/31/15	General Backfill Materials	Kristy Oxholm on behalf of Chris LeForce	
2015-008	8/31/15	Adhesion Testing – Field Coating	Kristy Oxholm on behalf of Chris LeForce	Superseded by 2015-011
2015-009	9/14/15	HDD Sacrificial Weld Coating	Chris LeForce	
2015-010	9/30/15	Pipe Surface Preparation for Shrink Sleeve Weld Coating	Chris LeForce	
2015-011	9/30/15	Adhesion Testing – Field Coating	Chris LeForce	Replaces 2015-008

*Dispositions: Expired, Superseded, Cancelled

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/24/2015

Subject: Reporting Potential Vandalism

Directive Number: 2015 - 001

Upon discovery of any damage to pipeline components, construction equipment or anything else associated with this project which appears to be a result of vandalism (or the cause of such damage is unknown and not attributable to normal wear and tear, damage inflicted during routine construction activities, etc.), the Construction Management Team shall be notified as soon as possible.

The notification should be first to the on-site inspector and through the chain of command to the Chief Inspector and Construction Manager. The Construction Manager will in turn notify the Project Manager.

This early reporting will allow for prompt notification of law enforcement authorities, if deemed appropriate. This reporting will also allow for realization of trends (i.e., scratched pipe in multiple different locations) which may influence the Construction Management Team's decisions in determining a course of action to follow.

Issued by (print): John Stamatov

Signature: ______________________

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/24/2015

Subject: Cathodic Protection (CP) Test Stations for the first 11 miles

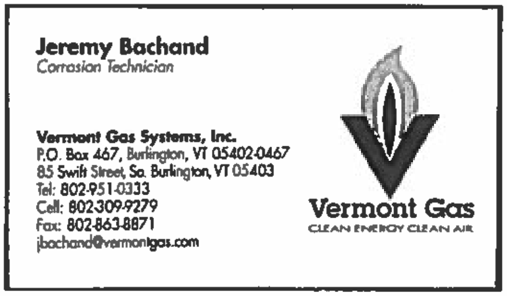
Directive Number: 2015 – 003 (Revision 0)

Please use the attached documents when installing the CP Test Stations on the first 11 miles of ARNGP Phase I. The documents included are:

- Proposed CP Test Station Locations
- Corrosion Control – Cathodic Protection (2015 VGS Operations and Maintenance Manual)
- Two Wire Test Station Detail*
- Four Wire IR Drop Test Station Detail

* The detail included does not indicate the color of the wires for the two wire test station. Use white wire as stated in the Corrosion Control – Cathodic Protection Procedure in the 2015 VGS Operations and Maintenance Manual.

Also please notify the VGS Corrosion Technician, Jeremy Bachand, when any installation is scheduled. He will either inspect the test station during installation or afterwards if he is unavailable at the time of installation.



Jeremy Bachand
Corrosion Technician

Vermont Gas Systems, Inc.
P.O. Box 467, Burlington, VT 05402-0467
85 Swift Street, So. Burlington, VT 05403
Tel: 802-951-0333
Cell: 802-309-9279
Fax: 802-863-8871
jbachand@vermontgas.com

Vermont Gas
CLEAN ENERGY CLEAN AIR

Issued by (print): Christopher LeForce

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas Addison Rutland Natural Gas Project (ARNGP) – Phase I

Proposed CP Test Station Locations (First 11 Miles) August 14, 2015

Test Station #	Approx. Station	Approx. Mile Post	Distance Between Boxes	Station Type	Location Description	Town	Land Parcel	
							LL #	Landowner
0	0+00	0.00	0.00	Two Wire	Colchester Launcher	Colchester	1.03	Cade
1	26+00	0.49	0.49	Four Wire IR Drop	Mill Pond Road Crossing	Colchester	2.02	Town of Colchester
2	67+00	1.26	0.77	Two Wire	Access Road "C"	Colchester	3	State of Vermont
3	109+00	2.06	0.80	Two Wire	Rt 2A Crossing	Essex	5	State of Vermont
4	158+00	2.99	0.93	Two Wire	VELCO 289 Crossing	Essex	6	State of Vermont
5	214+00	4.05	1.06	Two Wire	Rt. 15 Crossing	Essex	9	State of Vermont
6	240+50	4.55	0.50	Two Wire	Essex Way Crossing	Essex	9	State of Vermont
7	302+00	5.71	1.16	Four Wire IR Drop	I-89 "Jughandle"	Essex	9	State of Vermont
8	356+00	6.74	1.03	Two Wire	Winooski River HDD Begin	Essex	14	Steiner
9	374+00	7.08	0.34	Two Wire	RR Crossing	Williston	21	CSWD
10	399+50	7.57	0.49	Two Wire	Redmond Road	Williston	23	CSWD
11	443+50	8.40	0.83	Two Wire	Redmond Road	Williston	30	CSWD
12	481+00	9.10	0.70	Two Wire	Mountain View Rd Crossing	Williston	36	Town of Williston
13	518+50	9.82	0.72	Two Wire	West of Catamount CC, Bike Path	Williston	38	State of Vermont
14	551+00	10.43	0.61	Four Wire IR Drop	Williston Station	Williston	41	Town of Williston

Referring Sections:
192.453 – Requirements for Corrosion Control – General
192.455 – External corrosion control: Buried or submerged pipelines installed after July 31, 1971
192.457 – External corrosion control: Buried or submerged pipelines installed before July 31, 1971
192.463 – External corrosion control: Cathodic Protection
192.467 – External corrosion control: Electrical isolation
192.469 – External corrosion control: Test stations
192.471 – External corrosion control: Test leads
192.473 – External corrosion control: Interference currents
49 CFR 192 - Appendix D

See also following procedure:
Inspection

Corrosion Control procedures, including those for the design, installation, operation and maintenance of cathodic protection systems, must be carried out by, or under the direction of, a person qualified by experience and training in pipeline corrosion control methods.

Cathodic Protection Design Procedure:

All new steel transmission, distribution and service installations will be reviewed by the Corrosion Technician, and/or the Manager of Engineering, for inclusion of the proper cathodic protection devices, anodes, insulators, test stations, etc. Changes or modifications to new or existing systems shall not be permitted unless the Manager of Engineering approves such changes.

All new steel pipe installations will have a cathodic protection system designed to protect the pipeline in its entirety within one year of installation. If any deficiencies should be discovered, they will be reviewed by the Corrosion Technician and corrective measures will be recommended.

When practical, the following corrosion control data should be recorded on the initial survey of a new steel pipeline installation:

1. Location of All Test Stations
2. Pipe Coating Resistance - when practical
3. Protective Current Applied to New Pipe - when practical
4. Pipe to Soil Potentials of New Pipe

Electrical isolation shall be designed and maintained with the use of insulating devices such as insulating unions, flanges, insulating joints, fiberglass shields, casing seals and link seals. Typical locations where insulating devices should be installed include:

1. Metallic structures, such as bridges, pipe support stanchions, pilings, and reinforced concrete structures.
2. Casings and sleeves
3. River weights and pipe anchors
4. Gate stations
5. Service risers
6. Information gathering systems such as SCADA devices

Coated steel carrier pipe must be electrically isolated from metallic casings with the use of insulating devices such as casing seals and link seals. Care shall be used when inserting the coated carrier into the casing to reduce the possibility of damaging the coating and creating electrical shorts. Electrical isolation shall be confirmed at all installations.

Electrical insulators are not to be installed in an area where a combustible atmosphere is anticipated (such as in a vault), unless precautions are taken to prevent arcing.

In areas where fault currents or unusual risk of lightning may be anticipated, such as in close proximity to electrical transmission tower footings, the pipeline must be provided with protection from such currents as recommended by the Corrosion Technician and Manager of Engineering. These protective measures must also be taken at insulating devices, such as those at gate stations.

The protection from these fault currents shall typically be provided with the installation of a grounding cell (such as a Kirk Cell) or an isolator/surge protector. These devices act as an insulator (or isolator) at low DC voltages but conduct AC and high DC fault currents to ground to prevent potentially hazardous voltages from being developed on the pipeline.

<u>The following wire types will be used unless otherwise specified:</u>

Galvanic Anodes shall be supplied with a Minimum #12 AWG solid copper wire with 600 Volt T.W. Type Insulation.

Test Wire: This will be #8-12 AWG solid copper wire with 600 Volt T.W. Type Insulation.

Test Stations

Previous installation may not have followed the current wire color conventions.

The number and location of test points throughout a cathodic protection system shall be such that they provide sufficient data to determine the adequacy of cathodic protection. These test points are to be determined by, or under the direction of, a person qualified by experience and training in pipeline corrosion control methods. Test stations should allow sufficient access to the pipeline for all necessary tests including pipe-to-soil potentials, current flows and interference test.

VGS will install and maintain CP test stations to ensure all pipelines are adequately protected.

Spacing of test stations along the pipeline system will vary widely depending upon the type of soil, moisture, quality of pipe coating, size of pipe, type of cathodic protection system, level of cathodic protection, etc. With so many variables involved, the distance between test stations must be based on the judgment of a person qualified by experience and training in pipeline corrosion control methods for the specific installation and conditions.

As a rule of thumb VGS test stations should be located, on average, every one mile along the transmission system. Test stations will generally be located at road crossings so that they are accessible and can be maintained. Items that may prohibit test stations from the one mile average may include large farm fields, swamps, rivers and streams.

Test Station Location Requirements:

When designing new installations, test station leads must always be installed at the following locations:

a. Pipe Casings
b. Insulating Joints
c. Galvanic Anode Installations
d. Rectifier/impressed Current Anode Installations
e. As directed after review by the Corrosion Technician

Casing Test Stations:

Any installation where steel carrier pipe is inserted into a steel casing requires a test station with leads from both the carrier pipe and casing. Casing test leads will be blue

#8-12 AWG wires and pipe test leads will be black #8–12 AWG wires.

Specific locations and use of stations shall be specified by the Corrosion Technician.

Two-Wire Test Station:

Two-wire test stations will contain 2 white #8-12 AWG wires.

The Corrosion Technician shall specify locations and use of stations.

Four-Wire Test Stations:

Four-wire test stations are generally used to test the pipe on either side of an insulated coupling or other insulator. Black #8–10 AWG wires will be used on one side of the insulator; white #8–10 AWG wires will be used on the other.

The Corrosion Technician shall specify locations and use of stations.

Current Measuring Test Stations (IR Drop):

The Corrosion technician shall specify locations and use of

stations. Special Test Stations:

On occasion, specific situations may dictate the use of special test stations not outlined in the procedure. The arrangement and location will be specified by the Corrosion Technician for each special installation.

Test lead wires are required for various corrosion control testing and monitoring operations after pipe installation. Test wires must be securely attached to the pipe or structure and must be installed in the configuration recommended.

Connection to steel pipe or structures:

Connection of test wires to pipe or structures must be of such a nature as to maintain mechanical strength and electrical continuity.

The only acceptable method is the thermite connection.

Thermite Connection (Cadweld) - The thermite connection for STEEL should use ONLY

15 gram F-33 alloy charges. For #8-12 AWG wire, use cartridge 15P. The powder is copper oxide and aluminum.

Thermite Welding of Wires:

USE CAUTION WHEN MAKING THERMITE CONNECTIONS NOT TO BREATHE ANY FUMES GENERATED DURING THE PROCESS.

Manufacturer's instructions should be consulted. The wire shall encircle the pipe at least once and then be knotted at the top pipe surface to provide a strain relief for the connection. The end of the wire to be attached shall be prepared as follows:

a. For #10 AWG solid anode wire, approximately 3" of the end shall be stripped and the conductor doubled over to provide a 1 ½" connection end.

b. For #8 AWG or #6 AWG copper test wire, approximately 1 ½" of the end shall be stripped and twisted tight and inserted into a copper sleeve supplied with the kit. Compress the sleeve so that it remains firmly on the wire. The thermite welder mold shall have a metal disk and a weld charge placed in the chamber. The mold shall be seated on the cleaned pipe surface, and the wire shall be inserted into the mold slot to its full depth. While the mold is held firmly in place, the charge is ignited and then allowed to cool approximately 15 seconds so the molten metal may solidify. After removal of the mold, the connection shall be tested for strength by striking it sharply with a hammer. After cooling, all thermite connections shall be coated with primer and wax tape or other approved coating methods.

Recoating of Pipe and Wire at Thermite Connection:

For steel pipe, after the thermite weld has cooled sufficiently, prime and tape the weld and adjacent area to provide a coating of similar integrity and strength of mill-applied coating.

Minimizing Stress Concentration:

The test wires shall be securely tied around the pipe so that the connection point will not be affected by any undue stress on the wires and to minimize possible stress concentration on the pipe. Sufficient slack shall be allowed in the installation of all test wires.

Mechanical Connections:

In areas involving leak repairs where residual gas is present, a mechanical clamp may be substituted for a thermite connection. This clamp will be designed specifically for the installation of a sacrificial anode.

Mechanical Splicing Connections:

Mechanical connectors shall be utilized to make wire-to- wire connections either in-line or branch. In-line connections shall be made with a water proof wire connector, while branch connections shall be made with a split-bolt connector. Split-bolt connectors allow branch connections from a header cable without cutting of the header cable itself, requiring only removal of insulation.

Impressed Current Systems:

Impressed current systems shall be utilized to protect large underground structures or distribution systems where stray currents on adjacent foreign structures would not be a serious problem. Ground bed design and rectifier selection are the responsibility of the VGS Corrosion Technician or corrosion consultant. Owners of adjacent underground metallic structures shall be notified before such systems are energized.

Galvanic Systems:

Design and layout of galvanic anode systems shall be the responsibility of the Corrosion Technician or corrosion consultants. Such systems are preferred for smaller sections of pipeline and in areas where stray currents generated by an impressed current system may cause serious damage to other underground metallic structures and where soil conditions permit with respect to resistivity of soil.

Installation of Anodes includes but is not limited to extra depth excavation, cadwelding, connecting, coating and wrapping, wetting, conduit, drip box, and terminal box. Do not connect anodes directly to the pipe under any circumstances, unless approved by the Corrosion Technician.

Efforts shall be made to install anodes parallel to the pipeline at least two (2) feet from the center of the pipeline, and at a distance of ten (10) foot centers when possible.

Anodes will be buried to an elevation of at least one (1) foot from the bottom of the pipeline to the top of the Anode.

Each anode wire lead will be connected to a collector cable (A.W.G. #8-10AWG solid copper with thin type insulation) which shall be installed parallel to the pipeline and over the anodes. Connection to the cable to be made with split bolt copper connectors for #8-12AWG. Connectors shall be wrapped.

Two #8-12AWG main leads shall be attached to the pipeline by the cadweld method. The wires will be two (2) feet apart on the pipeline. The two main leads and collector cable will be terminated together in either a test box or a post mounted terminal box.

When possible, wet the anodes before backfilling. Particular care must be taken in backfilling to ensure the wires are not severed, or damaged.

Insulated Fittings and Couplings

If the corrosion process is to be stopped, it is necessary to break the electrical path or continuity between the gas pipe and all metals cathodic to it. This is done by installing an insulation fitting between the metals. Insulating couplings, tees, flanges, and other insulating fittings are used to break the electrical path. The insulation fitting and the pipe adjacent to it must be well coated to eliminate exposure and a reverse coupling effect.

A. Coated steel pipe shall be insulated from the following structures:

   1. Unprotected pipe
   2. Bare steel pipe
   3. Cast and ductile iron pipe
   4. Copper pipe
   5. District regulator vaults
   6. Casings
   7. House piping
   8. All other pipelines or structures

B. The insulating end of insulating fitting shall go on the side towards the unprotected pipe.
C. A reasonable effort should be made to test insulating fittings after installation.
D. When non-insulting compression fittings are used, the pipe ends shall be thoroughly cleaned to bare metal to insure metallic contact with the fittings.
E. Steel main inserted into a casing shall have "insulators" installed.

Approved insulated fittings and couplings shall be used to electrically isolate new piping from old piping. Where new coated steel piping will be connected to either old bare steel or cast iron piping, an insulated fitting or coupling must be used. The Corrosion Technician shall have the responsibility of determining the need for an insulated fitting or coupling in all other applications. Insulated fittings and couplings shall be installed by closely following the manufacturer's directions.

Wire and Cable:

Wire and cable shall be suitable for the particular applications. Galvanic systems may utilize standard #8-12AWG wire with THW grade insulation for all underground and above-grade wiring. Impressed current systems may utilize #8-12 AWG wire with THW grade insulation for test wires. 8AWG may be utilized for the negative rectifier cable. However, cable attached to the positive rectifier terminal and used for direct burial in a ground bed shall be cathodic protection cable with High Molecular Weight Polyethylene (HMWPE) insulation. Actual cable size shall be determined by the Corrosion Technician for each installation.

Where underground wiring is to be direct-buried, the surrounding backfill shall be hand-shoveled, rock-free material. Minimum cover for underground wiring in a trench shall be 18". All wiring shall be inspected for damage to the insulation. Galvanic systems may have insulation repaired by taping with electrical tape. Impressed current systems shall not use any cable which, in the opinion of the Corrosion Technician, has excessive insulation damage. Where impressed current cable is deemed to be repairable, only resin type splice kits or cable sleeves that can be heat-shrunk shall be used to repair the defect.

Connections and Splices:

Thermite Weld Connections:

Thermite weld connections shall be the preferred method of attaching cable or wire to underground steel pipes or structures. Refer to specific instructions regarding thermite welding procedures above. The thermite weld is a fusion weld of the conductor to the surface, using a special alloy with a minimum heat effect on the structure.

Mechanical Connections:

In areas involving leak repairs where residual gas is present, a mechanical clamp may be substituted for a thermite weld connection. This clamp will be designed specifically for the installation of a sacrificial anode.

Splice Coating - Impressed Current Systems:

Connections in impressed current ground beds are susceptible to consumption if they are not insulated from the underground electrolyte, so specially manufactured splice kits are used on these connections. Two types of kits are available:

1. Resin Splice Kits. A pre-formed mold is snapped over the connection, and an

epoxy resin is mixed and poured into the mold and allowed to harden and encapsulate the connection.

2. Fold-Over Splice Kits. A symmetrical sheet of elastomeric compound with a depression on each side. The connection is primed and depressed into the encapsulating gel on one side, while the other half is folded over to seal the connection.

Splice Coating - Galvanic Systems:

All splices shall be coated by one of two methods:

1. Immersed in mastic and allowed to dry.
2. Immersed in primer and allowed to dry; wrapped in electrical or cold-applied tape to cover.

Temporary installations:

Temporary installations are defined as those installations not to be in service for greater than five years beyond installation, need not be cathodically protected if corrosion on that pipeline during that five year period will not be detrimental to public safety.

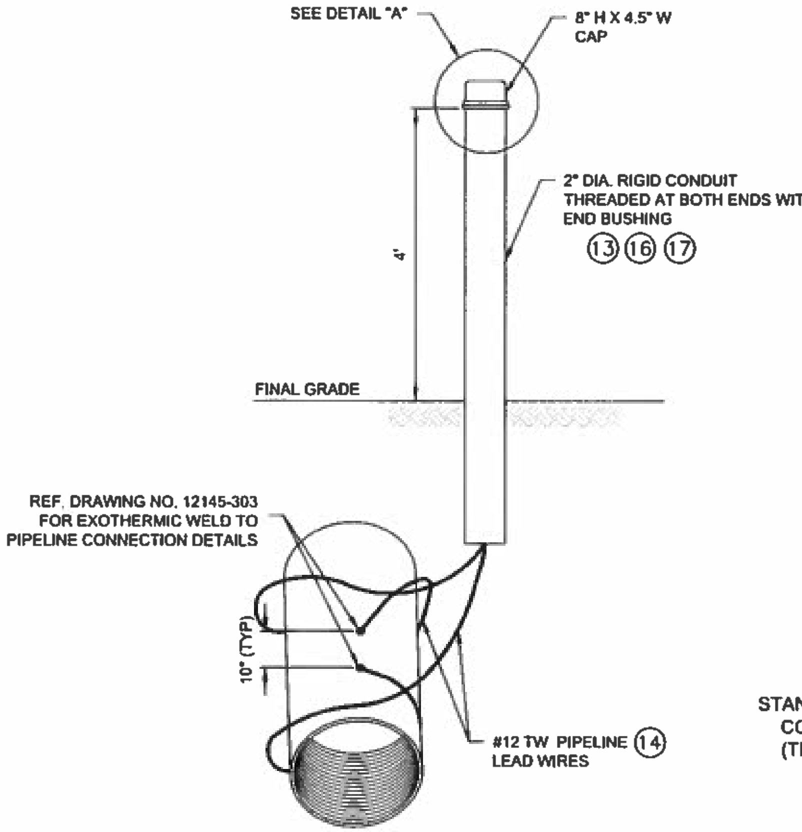
Cathodic Protection Criteria

The criteria for cathodic protection and determination of measurements used by VGS are as described in 49 CFR 192 - Appendix D.

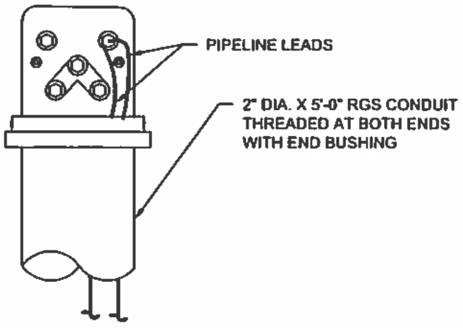
REV	DESCRIPTION	DATE	APPROVED
A	ISSUED FOR CONSTRUCTION - ECO 2014-025	6/27/14	JM

NOTES:

1. REMOVE PIPELINE COATING AND CLEAN TO BARE METAL.
2. LOOP & HITCH WIRE AROUND PIPE WITHOUT DAMAGING PIPE COATING, BEFORE THERMITE WELDING.
3. USE 15 GRAM CHARGE FOR EACH EXOTHERMIC WELD AND FOLLOW PROCEDURE RECOMMENDED BY THERMITE WELD MANUFACTURER.
4. USE THERMOWELD ADAPTER SLEEVE P/N 38-0200-00 OR EQUAL FOR EXOTHERMIC WELD CONNECTIONS OF #12 TW LEADS TO PIPELINE.



TEST STATION



DETAIL A
STANDARD TEST STATION
CONNECTION DETAIL
(TESTOX MODEL 715)

CLIENT
GHA

SITE
VERMONT GAS SYSTEMS, INC.
ADDISON NATURAL GAS PROJECT
CATHODIC PROTECTION
SYSTEM DESIGN

PROJECT NO. 12-E-145-CP

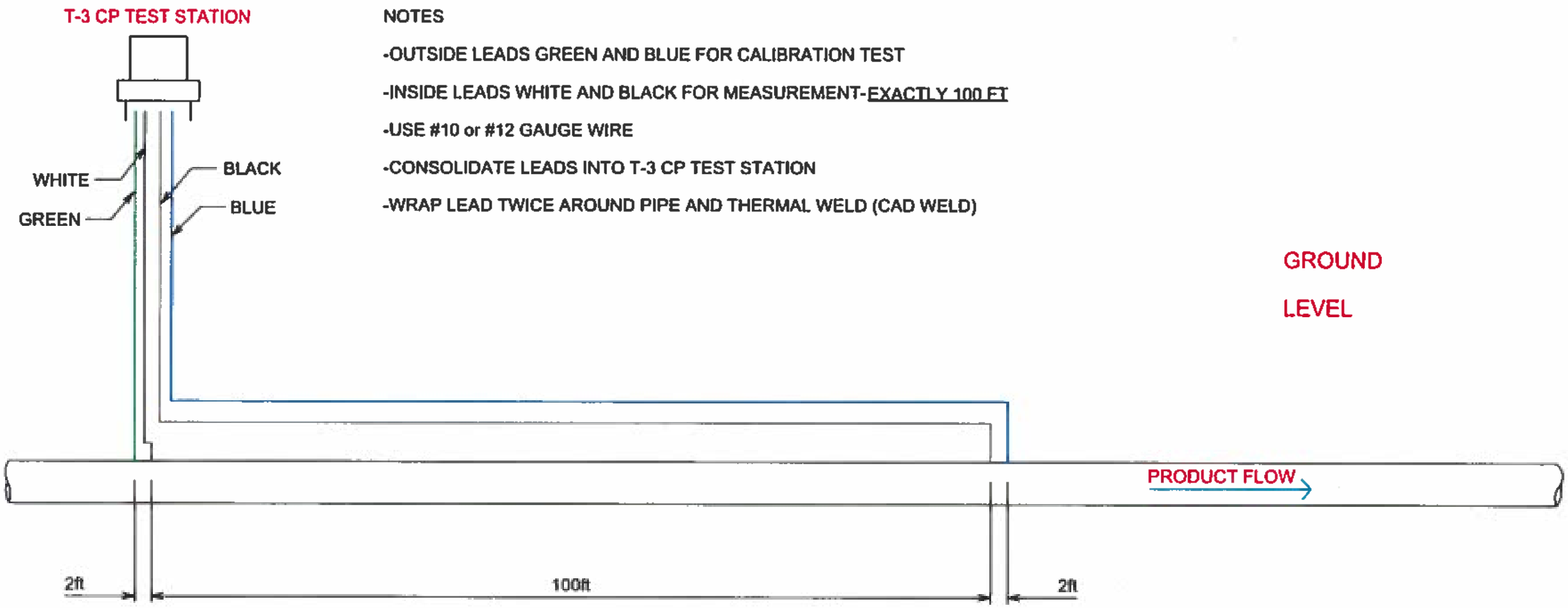
ARK
ENGINEERING & TECHNICAL SERVICES, INC.
ARK ENGINEERING & TECH. SERVICES, INC.
639 GRANITE STREET
SUITE 200
BRAINTREE, MA
02184 U.S.A.

DRAWN BY	DATE	SIZE
JRW	6/18/13	B
APPROVED BY	DATE	SCALE
JM	9/30/13	NTS

TITLE
TEST STATION INSTALLATION

DWG. NO. 12145-302
REV A
CAD FILE NAME 12145-302-1-RA
SHEET 1 OF 1

4-WIRE IR DROP TEST STATION



NOTES

-OUTSIDE LEADS GREEN AND BLUE FOR CALIBRATION TEST

-INSIDE LEADS WHITE AND BLACK FOR MEASUREMENT-EXACTLY 100 FT

-USE #10 or #12 GAUGE WIRE

-CONSOLIDATE LEADS INTO T-3 CP TEST STATION

-WRAP LEAD TWICE AROUND PIPE AND THERMAL WELD (CAD WELD)

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/28/2015

Subject: Welding Line Up Clamp Usage Clarification

Directive Number: 2015-004

The Butt Weld procedures used on this project (WPS-VGS-B-2 2014-2; WPS-VGS-X-65-2 2014-2) indicate that the use of an external line up clamp is allowed, but not required. This directive serves as a notification that the use of an external line up clamp is required on all main line girth welds on this project except when it is not feasible due to situations where the contour of a fitting does not allow use. In such cases the weld will be fitted up in a manner that does not place undue stress on the weldment. This is also stated in the Technical Specification Section 137000 – Welding in Part 3, Subsection 3.3(B).

If another situation arises where use of a clamp is not feasible, then it must be reviewed and approved by the Construction Inspection Team and VGS Operations.

The clamp shall not be removed until a minimum of 50% of the root bead has been placed, according to the instructions in the WPS and Section 137000 – Welding.

This Project Directive replaces 2015-002.

Issued by (print): Christopher LeForce

Signature: 8/28/2015

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/1/2015

Subject: Construction in Sand Area

Directive Number: 2015 - 005

In 3.5(B) – Bedding and Backfilling of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications: pipe supports shall be installed in all locations prior to backfilling, unless otherwise directed by the Construction Management Team.

This document serves to direct the construction without pipe supports in the sand area from station 240+26 to station 279+75, as the uniform sand in the trench meets requirements for select backfill.

Issued by (print): John Stamatov

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/31/2015

Subject: Backfill Compaction in Typical Cross-Country Areas

Directive Number: 2015 – 006

In 3.5(D)(1) – Bedding and Backfilling of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications, it states that the pipe trench in typical cross-country areas shall be thoroughly compacted by mechanical means to avoid any future trench settlement. In these cross-country areas, the trench can be compacted by mechanical means using an excavator bucket.

Compaction shall occur when there is at least 12" of sand padding and 12" of general backfill above the pipe and at a maximum of 24" lifts thereafter. Final compaction at grade can be completed using either an excavator bucket or the tracks of a piece of excavating equipment.

The use of an excavator for mechanical means of compaction in cross-country areas is typical in transmission line construction.

Issued by (print): Kristy Oxholm (for Christopher LeForce)

Signature: K Oxholm

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 8/31/2015

Subject: General Backfill Materials

Directive Number: 2015 – 007

In 2.1(B) – Materials of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications, it states native materials containing no stones or clods larger than 3" in the longest dimension are acceptable for general backfill. This directive will serve as notice that native materials containing no stones or clods larger than 6" in the longest dimension are acceptable for general backfill.

The VGS Operations and Maintenance Manual in the Trenching and Backfilling Procedure allows for this change to the specification and now the two documents will be consistent.

Issued by (print): Kristy Oxholm (for Christopher LeForce)

Signature: KHOxholm

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/14/2015

Subject: Sacrificial Weld Coating on HDD Installations

Directive Number: 2015 – 009

For added abrasion resistance on horizontal direction drill (HDD) installations, Canusa's Wrapid Shield™ XL shall be installed over the Powercrete® R-95 coated weld. Please follow all manufacturer's instructions regarding the installation of both coatings and ensure the coatings are installed by qualified contractor personnel. All installations shall be observed by an inspector from the VGS Construction Inspection Team. Also ensure that at least one adhesion test is completed on the Powercrete® R-95 coating before the Wrapid Shield™ XL is installed.

At least one weld coating shall be visually inspected and jeeped after the pullback operation.

Attached for added reference is a memo explaining the use of additional abrasion resistance coating, along with the installation guide and product data sheet for the Wrapid Shield™ XL.

Issued by (print): Christopher LeForce

Signature: 9/14/2015

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

MEMORANDUM

TO: Addison Rutland Natural Gas Project (ARNGP) File

FROM: Christopher LeForce

DATE: September 4, 2015

RE: Use of sacrificial coating over primary weld coatings on horizontal directional drilling (HDD) installations

Vermont Gas Systems, Inc. (VGS) is proposing to use a sacrificial coating over the primary weld coating on (HDD) installations. VGS is using Powercrete® R-95 liquid epoxy for the primary corrosion protection at the welds. The R-95 is a single coat, 100% solids, high build epoxy novolac that coats pipelines. As an abrasion resistant overlay (ARO) it is compatible with fusion bond epoxy (FBE) and CTE mainline coatings. The purpose of the sacrificial coating is to add additional protection to the weld coating during pullback of the pipe during the HDD process.

In HDD installations, a typical corrosion coating, like FBE, cannot be used because of the potential for the coating to be damaged down to bare metal. For that reason either an ARO coating is used over the FBE or a harder, more durable coating is used. The line pipe is coated with a two-layer system, a FBE coating under an ARO coating, which is the sacrificial coating. In a similar manner, VGS is proposing to add a sacrificial coating over the R-95 coating to provide additional protection.

VGS is proposing to use Wrapid Shield™ XL manufactured by Canusa-CPS, a Shawcor Company. Wrapid Shield™ XL is a fiberglass cloth, pre-impregnated with a resin that can be activated by salt or freshwater to coat and protect any diameter of pipe within minutes. The product is formulated to resist shear, impact and abrasion on pipe coating systems above and below ground such as fittings and joints on all mill-coated pipe and as an outer wrap over heat-shrinkable sleeves for added mechanical protection.

The purpose of the pipeline coating is to provide a barrier between the steel pipe and the elements that can cause it to corrode or rust. The coating is the primary corrosion control method of protection the pipe. If there is a coating break or holiday, then the pipe is protected by the secondary measure of cathodic protection (CP).

The question that has been brought up is does applying this type of coating cause cathodic shielding. Shielding is caused by an external material that prevents the cathodic protection (CP) current from getting to the steel pipe. Technically, properly applied coating fits into the definition of cathodic shielding because it does not allow any connection with a foreign material. In order for CP to work you need a full circuit for the current to flow from the pipe to the soil and back. Other foreign materials can cause shielding which include plastic sheets with no adhesion, tree roots, rocks, soil, improper backfill/compaction, casings, and any other high resistance materials.

As supported by a letter from Steve Anderson (NACE CIP2 # 25805) of Shawcor, dated August 12, 2015, a properly applied coating will not cause cathodic shielding. In this case when both coatings are applied correctly and appropriately tested to ensure no holidays, this will not cause a cathodic shielding condition. The sacrificial coating of the Wrapid Shield™ XL will help protect the primary coating of the R-95 from damage during the HDD pullback.

The primary coating of R95 will be applied per manufacturer's procedures, inspected by the construction inspection team, and properly checked for any coating holidays before the wrap is applied to ensure the integrity of the coating. After the installation of the pipe is complete, at least one coated weld will be inspected per the VGS inspection criteria.

In conclusion, the Wrapid Shield™ XL will help ensure the primary coating is protected and can function as designed in protecting the steel pipe. If the sacrificial coating is not used, there is a higher potential of having coating holidays in the primary coating and it would not be able to function properly. In this case the secondary corrosion control method of CP would be used to protect the pipe. In 49 CFR Part §192.461 External corrosion control: Protective coating, it states "if coated pipe is installed by boring, driving, or other similar method, precautions must be taken to minimize damage to the coating during installation." Using the Wrapid Shield™ XL is the best method of minimizing the damage to the primary coating during installation.

CANUSA-CPS
A SHAWCOR COMPANY

Wrapid Shield XL

Fiberglass Mechanical Protection for Field Joints on Directionally Drilled Pipelines

Product Description

Wrapid Shield XL is supplied within the kit and is contained in a heat-sealed foil pouch.

Installer Kit
An Installer Kit is supplied separately and includes Compression Film and Nitrile gloves.

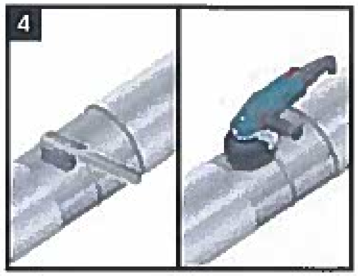
Equipment List

Appropriate tools for surface abrasion and preparation (wire brush/power wire brush or grit blaster, abrasive paper (40-80 grit), Knife, lint free rags, approved solvent and water spray bottle. Standard safety equipment: gloves, safety glasses, hard hat, etc.

Surface Preparation

Clean exposed steel and adjacent pipe coating with an approved solvent (Acetone, MEK, Alcohol >96%) to remove the presence of oil, grease, and other contaminants if present. Ensure that the pipe is dry prior to mechanical cleaning.

Surface Preparation

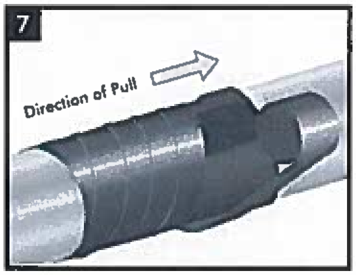


Surface preparation shall be as required for the specific corrosion coating used in conjunction with Wrapid Shield XL.

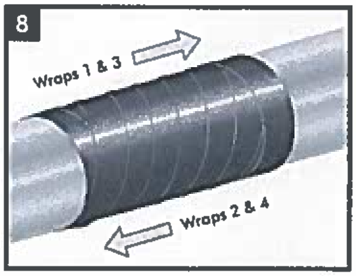
For heat-shrinkable sleeve corrosion coatings use the Canusa product specific installation guide.

Outer Wrap
Application Wrapid Shield XL

Water is needed to activate Wrapid Shield XL. Open the foil pouch, remove the roll. Once opened, the product cannot be repackaged. Wrapid Shield XL is activated using a water sprayer to mist and wet each layer as it is wrapped.

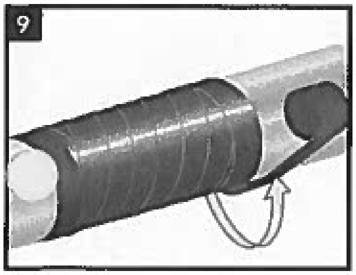


Starting at the trailing end of the field joint, begin the application at a distance of 50mm (2") past the inner corrosion coating and extend the wrap 150 mm (6") beyond the corrosion coating on the leading edge. Apply the first wrap circumferentially around the pipe at a 90° angle then begin spiral wrapping with a 50% overlap following the wrapping guideline that is printed on the roll. Apply pressure during application by pulling firmly on the roll as it is applied. Squeeze and mold firmly in the direction of the wrap until tight.



End with a circumferential wrap applied at 90° to the pipe. For high shear or impact requirements, additional layers may be required. To create thinned edges for directional drilling, reduce the overlap in the last 100mm - 150mm of the edges to 10-20% rather than 50%.

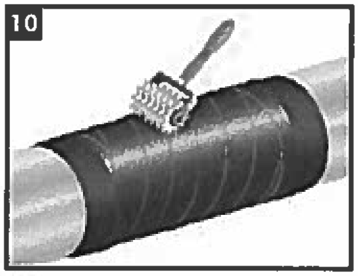
9



Apply compression film in the same direction as the previous layers with a 50% overlap. Start min. 50mm (2") beyond the outer edge of the Wrapid Shield XL, pulling firmly during application.

NOTE: Compression film should be applied before excess foaming is observed from the Wrapid Shield XL. A second installer should begin this step and follow the Wrapid Shield XL installer(s) as they progress with the wrapping of the pipe. The resin should be compressed and the film perforated as quickly as possible.

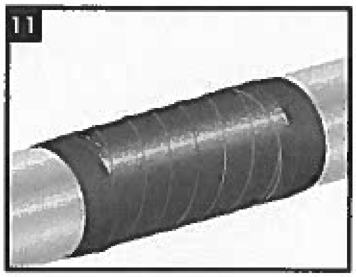
10



Perforate the compression film using a wire brush (or other perforating device) by tapping firmly on the tape with the metal bristles. Perforation allows the CO^2 gas generated by the curing process to escape. Compression film may be removed after material hardens and either discarded or left in place.

Prior to Pulling

11



Allow the Wrapid Shield XL to reach a Shore D Hardness of 70 prior to pulling. Wrapid Shield XL is fully cured at a Shore D Hardness of 83 @ 72°F.

Note: If holiday inspection is required it must be done after installation of the corrosion coating product is installed because the holiday detector with jeep on residual moisture in the Wrapid Shield XL installed product.

Storage & Safety Guidelines

To ensure maximum performance, store Canusa products in a dry, ventilated area. Keep products sealed in original cartons and avoid exposure to direct sunlight, rain, snow, dust or other adverse environmental elements. Avoid prolonged storage at temperatures above 35°C (95°F) or below -20°C (-4°F). Product installation should be done in accordance with local health and safety regulations.

These installation instructions are intended as a guide for standard products. Consult your Canusa representative for specific projects or unique applications.

Canusa-CPS
A division of ShawCor Ltd.

Head Office
25 Bethridge Rd.
Toronto, ON M9W 1M7 Canada
Tel: +1 416 743 7111
Fax: +1 416 743 5927

Canada
Suite 3200, 450 - 1st Street S.W.
Calgary, AB T2P 5H1 Canada
Tel: +1 403 218 8207
Fax: +1 403 264 3649

Americas
2408 Timberloch Place, Building C-8
The Woodlands, TX 77380 USA
Tel: +1 281 367 8866
Fax: +1 281 367 4304

Europe, Middle East,
Africa & Russia
Unit 3, Sterling Park,
Gatwick Road, Crawley, West Sussex
RH10 9QT United Kingdom
Tel: +44 1293 541254
Fax: +44 1293 541777

Asia-Pacific
101 Thomson Road,
#11-03 United Square
307591 Singapore
Tel: +65 6749 8918
Fax: +65 6749 8919

Canusa-CPS is registered to ISO 9001:2008

Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the installation guide when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this installation guide is to be used as a guide and is subject to change without notice. This installation guide supersedes all previous installation guides on this product. E&OE

Part No. 99060-228
IG_Wrapid Shield XL_rev010

LIBERTY SALES & DISTRIBUTION
2880 Bergey Road, Suite F • Hatfield, PA 19440 • Ph: 877-373-0118 • Fx: 888-850-3787

PRINCIPAL MANUFACTURERS

A.Y. MCDONALD MFG. COMPANY is the leading manufacturer of Plug and Ball style Gas Meter Shutoff Valves utilized in both residential and commercial applications up to 175 PSIG. A.Y. McDonald offers a variety of Integral Valve and Standard Configuration Meter Bars including single and multiple residential By-Pass Meter Bars and the newly developed Industrial By-Pass Bar. A full line of straight and off-set Meter Swivels, Meter Nuts, and Meter Plugs are also available in black malleable iron or a galvanized finish. 3 Part Unions in ¾” thru 2” diameters are also manufactured in a BMI finish.

BÖHMER is a worldwide leader in the manufacturing of forged, fully welded, trunnion mounted style ball valves for a variety of high pressure field applications. Nearly 60 years of German engineering and design have resulted in a state of the art production facility and one of the highest quality, flange/welded end valves available on the market. Böhmer Valves are available in diameter sizes ranging from 2” thru 56” with ANSI Class 150 to 1500 nominal pressure ratings, and made in accordance with API 6D standards.

CANUSA-CPS is the global leader in field applied corrosion protection systems. CANUSA Heat-Shrinkable Sleeves include Wraparound and Tubular Sleeve Systems and Tapes. CANUSA also offers HBE-95 Liquid Epoxy Coating for all your field joint coating needs. CANUSA products are also specified for a variety of specialty applications including Directional Drillings, Casings, Bridge Crossings, Water/Wastewater fittings, and elbows. CANUSA also recently developed Wrapid Shield™ PE, a high impact resistant rockshield to protect your corrosion coatings.

CCI PIPELINE SYSTEMS specializes in providing a complete line of Casing related products for the Gas, Oil, Water and Wastewater Industries offering Wrap-It Link Seals, High-Density Polyethylene, Carbon or Stainless Steel Casing Spacers, and Neoprene Rubber End Seals for Casing Pipe and Wall Penetration applications.

CHASE CORPORATION is a leading manufacturer of field applied coatings and tapes for the natural gas, oil, water and wastewater industries. Chase’s pipeline coatings division sells the highest quality and well respected brand name products including the Tapecoat ® and Royston ® suite of corrosion protection products. Their extensive product lines include a variety of Cold and Hot Applied Tapes, Sealants, Protective Outerwraps, Liquid Epoxies, Mastics, Petrolatum Wax Tapes and Casing Fill products and services.

CITADEL TECHNOLOGIES is the leading developer and only manufacturer of the Diamond Wrap suite of products on the market. The Diamond Wrap HP, Diamond Wrap and Black Diamond systems consist of a 100% Solid Epoxy coupled with a Bi-Directional Carbon Fiber Wrap. Our Carbon Fiber Composite Repair Systems are extremely low profile and unmatched in structural integrity used to completely restore corroded/eroded piping systems to their original MAOP without service interruption.

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PRINCIPAL MANUFACTURERS

DENSO is an internationally recognized leader in corrosion prevention and sealing systems for new and rehabilitation applications. DENSO developed the original Petrolatum Wax Tape and they have completed successful applications for over 75 years. DENSO's suite of corrosion products include: Petrolatum Wax Tapes for above/below grade applications, fast curing Protal Liquid Epoxies for standard and LOW TEMP applications, Bitumen and Butyl Tape systems, and Sealing/Molding products including their Profiling Mastic for irregular shaped valves and flanged connections.

ERICO is the worldwide CP connections leader. ERICO was the first to develop the exothermic welded electrical connections that will never loosen, corrode or increase in resistance. The remotely detonated, CADWELD® PLUS system is the latest advancement in welded connections providing your crews with simple and quick installations from outside the ditch.

GLAS MESH CO. manufacturers and supplies a complete line of Fiberglass Reinforced Plastic (FRP) Corrosion/Abrasion control oducts for a variety of pipeline applications such as Bridge/Aerial Crossings, Compressor/Pumping Stations, and Meter Set/Station piping applications. Glas Mesh products include the FRP Shields, Spacers, Saddles, Flatties, Casing Insulators, Coated U-Bolts and EPI Seam-Sealer.

LB&A manufacturers a variety of Non-Conductive Pipe Rollers, Pipe Hangers, and related support hardware for pipeline Bridge Crossing applications. LB&A's Hangers and related support hardware are available in a variety of corrosion prevention finishes including stainless steel and a proprietary BLUECOAT system. LB&A products have been proven to provide long-term durability, weatherability and performance.

LIBERTY COATING COMPANY

A Liberty Group Company

LIBERTY COATING COMPANY, LLC is the Northeast leader in the application of anti-corrosion coatings for the gas, oil, electric, water and wastewater industries. In addition to our PRITEC® coating system, Liberty applies ID/OD Specialty Paint and Lining Systems and provides Pipe-Type Cable Flaring and Coatings. Liberty Coating is located on 35 acres with Rail and Truck access. Pipe Handling, Cutting, Storage, and Logistical Freight Services are also available.

LIBERTY SALES & DISTRIBUTION

Directional Drilling Coatings

LIBERTY SALES & DISTRIBUTION, LLC offers products from the pipeline industries leading manufacturers of HDD coating systems. These include the liquid epoxy coatings Powercrete J, Powercrete R-95, Denso ARO, Warrior 100, as well as the Canusa DDX heat shrink sleeve system. Liberty Sales readily stocks these coating systems, ensuring quick response and timely delivery.

PRINCIPAL MANUFACTURERS

LIBERTY SALES & DISTRIBUTION

Pipeline Markers

LIBERTY SALES & DISTRIBUTION, LLC can provide you with all your marking needs for both underground and above ground infrastructure. The Liberty Dome Post, Test Station, Vent Casing Post, and Flat Marker Post are all made from impact resistant, UV stable plastics and resins that will provide long term marking protection. They are available in standard lengths and colors.

LIBERTY SALES & DISTRIBUTION

Pipeline Pigging Products

LIBERTY SALES & DISTRIBUTION, LLC serves the pipeline industry by distributing a wide selection of pipeline pigging products and accessories. Our pipeline pigging products are available in most sizes for cleaning, swabbing and batching solutions for your pipeline. Whatever the job requires, Liberty Sales can provide the proper pig, pig launcher or pig tracker, each customized to the customers specifications.

LIBERTY SALES & DISTRIBUTION

Liberty HD Rockshield®

LIBERTY HD ROCKSHIELD® provides high impact and abrasion resistance to protect all of your underground pipeline infrastructure needs. Made from a random looped, lead free, PVC material, this high-density rockshield will save you money by eliminating the need for select back fill, and provide long term abrasion resistance for the life of the pipeline. We will custom cut most orders to help reduce waste on your project. Liberty Sales and Distribution also provides a variety of lighter weight rockshields to meet all your underground pipeline protection needs.

LIBERTY SALES & DISTRIBUTION

Tracer Wire & Cathodic Protection

LIBERTY SALES & DISTRIBUTION, LLC supplies a variety of solid/stranded copper Tracer Wire and CP Wire for your damage prevention and corrosion protection needs. Our HMWPE Tracer Wire is insulated with a rugged, moisture resistant High Molecular Weight Polyethylene (HMWPE) ideal for direct burial applications in the Gas, Fiber Optic, Water and Wastewater Industries. Our CP wire is available in #2 - #8 sizes along with a variety of color options. Custom markings and packaging is available upon request.

MONTI
Tools Incorporated

MONTI TOOLS INC. produces high quality surface preparation tools that provide consistent profile depth for field joints and countless other applications. The Monti Bristle Blaster Kit is available in both electric and pneumatic models with a wide selection of attachments. They are widely used in both shop and field applications and can provide SSPC-SP10 surface cleanliness and anchor profile up to 4.7 mils depending upon the substrate.

SPY® PIPELINE INSPECTION COMPANY, LTD

PIPELINE INSPECTION COMPANY produces a host of pipe inspection products including the well known SPY Holiday Detector. Each of the SPY Portable Holiday Detectors offer an indefinite adjustable voltage settings range including the Model 780 (1kV-5kV), Model 785 (1kV-15 kV) and the Model 790 (5 kV-35 kV). The positive ground light and audible alarm features are designed with safety in mind and the rugged ergonomic design and easy installation batteries makes for the most efficient and reliable Jeep on the market.

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PRINCIPAL MANUFACTURERS

TECO AMERICAS

TECO AMERICAS - The FireBag® Thermal-activated Gas Shut-off Device automatically turns off the gas supply in the event of a fire, preventing explosions and the spreading of fire. In the unfortunate event of a fire, when the external ambient temperature of The Firebag® reaches 203-212°F (95-100°C) the metal alloy that keeps the plug & cartridge together melts. Then the spring pressure pushes the plug against the gas opening closing it completely. No fire or heat detectors are required to automatically intercept gas flow. Meets AGA/CGI ANSI Z21.15, DIN 3586 and UIE EN 1775 standards for indoor gas installations.

Western Technology

Explosion Proof & Low-Voltage Lighting Specialists
& Industry's Most Complete Line of Deadman Style Remote Controls™

WESTERN TECHNOLOGY INC. is the premier manufacturer and supplier of Explosion Proof and Low Voltage Lighting products, serving a variety of industries. The NEW UL Approved, CLASS I DIV I BRICK Light offers brilliant white LED lighting with safety and "kick it tough" durability. The BRICK Light provides superior lighting with minimal heat generation even after hours of operation. Western Technology also provides a complete line of Explosion Proof Products for a variety of applications in hazardous locations.

WOODARD &CURRAN

WOODARD & CURRAN has successfully served the energy market for over 20 years providing a broad scope of regulatory, environmental, and construction support services with clients specializing in the generation, transmission, distribution, and the storage of [illegible]gy. Woodard & Curran's experience includes electricity, natural gas, petroleum, nuclear energy, heat/power, and the renewable energy sectors. Typical services include: design engineering, linear project routing and permitting, site evaluations, feasibility studies, regulatory compliance, wetland use and resource permitting, mapping and GIS services.

CONTACT INFORMATION

Corporate Office:

Liberty Sales and Distribution, LLC
2880 Bergey Road, Suite F
Hatfield, PA 19440
Phone: (877) 373-0118
Fax: (888) 850-3787

www.libertysales.net
www.libertyhd.net
www.libertymarkers.net

Tracey Rocchino
Office Manager
Email: trocchino@libertysales.net

Tracy Nixon
Inside Sales Representative
Email: tnixon@libertysales.net

[illegible]a Rorer
Inside Sales Representative
Email: jrorer@libertysales.net

Regional Offices:

New England Territory
Wally Armstrong
Cell: (978) 815-8336
Email: warmstrong@libertysales.net

Mid Atlantic Territory
George Rocchino
Cell: (267) 767-9423
Email: grocchino@libertysales.net

Southern Territory
Lou Taylor
Cell: (267) 664-8177
Email: ltaylor@libertysales.net

Northern Territory
Shane Quackenbush
Cell: (518) 441-5532
Email: squackenbush@libertysales.net

Outside Sales Consultants:

Mid Atlantic Territory
Chuck Lang IV
Cell: (215) 350-9990
Email: clang4@libertysales.net

New England Territory
John Maher
Cell: (207) 650-5740
Email: jmaher@libertysales.net

CANUSA-CPS
A SHAWCOR COMPANY

Wrapid Shield™ XL/XL-FC

Fiberglass Mechanical Protection for Field Joints on Directionally Drilled Pipelines

Wrapid Shield™ XL/XL-FC is a fiberglass cloth, preimpregnated with a resin that can be activated by salt or freshwater to coat and protect any diameter of pipe within minutes. The product is formulated to resist shear, impact and abrasion on pipe coating systems above and below ground such as fittings and joints on all mill-coated pipe and as an outer wrap over heat-shrinkable sleeves for added mechanical protection.

Superior Mechanical Protection

- Provides unparalleled protection against impact, indentation, abrasion, punctures and tears that may result from directional drilling, rough handling, native backfills or severe in-service conditions.
- Designed to protect the underlying field joint coating from the effect of forces associated with directional drilling.

Chemical Resistance

- Resistant to corrosive salt water, soil acids, alkalies and salts, common chemicals, chemical vapors, and exposure to outdoor weathering and sunlight.

Long Term Corrosion Protection

- In combination with a heat-shrinkable sleeve the composition of the products is such that they provide an effective barrier to water and oxygen which provides effective corrosion protection and soil stress resistance.

Different Cure Speeds Available

- Wrapid Shield™ XL is available in 2 configurations depending on project or environmental conditions.
- Wrapid Shield™ XL is the standard version and has an application time of 20 minutes at 23°C.
- Wrapid Shield™ XL-FC is a Fast Cure version and has an application time of 5 minutes at 23°C.

Applications

- Oil & Gas
- Onshore Pipelines
- Offshore Pipelines
- Girth-Weld Joints
- Directional Drilling

Wrapid Shield™ XL/XL-FC

Fiberglass Mechanical Protection for Field Joints on Directionally Drilled Pipelines

Typical Wrapid Shield™ XL Properties*	Test Method	Typical Values
Cure Time at 23°C**		20 min.
Lap Shear Strength	ASTM D3163	12 Mpa
Density	ASTM D792	1.15 g/cm³
Glass Transition Temperature (DSC)	ASTM D3418	Tg = 175 - 189°C
Tensile Strength	ASTM D638	248 MPa
Hardness	Shore D	80
Dielectric strength	ASTM D149	16 kV/mm
Flexural Strength	ASTM D790	405 MPa
Compressive Strength	ASTM D695	165 MPa
Impact Resistance	ASTM G14/G62 (MOD)	167 J

Typical Wrapid Shield™ XL-FC Properties*	Test Method	Typical Values
Cure Time at 23°C**		5 min.
Density	ASTM D792	1.14 g/cm³
Tensile Strength	ASTM D638	206 MPa
Hardness	Shore D	> 70
exural Strength	ASTM D790	372 MPa
Impact Resistance	ASTM G14/G62 (MOD)	167 J

*With an 8 layer system.

**Cure times will vary depending on substrate temperature. Please contact your local Canusa office for help in determining which configuration would work best for your project's conditions.

Since 1967, Canusa-CPS has been a leading developer and manufacturer of specialty pipeline coatings for the sealing and corrosion protection of pipeline joints and other substrates. Canusa-CPS high ormance products are manufactured to the highest quality standards and are available in a number onfigurations to accommodate many specific project applications.

The product information shown here is intended as a guide for standard products.

Consult your Canusa representative for specific projects or unique applications.

Canusa-CPS
A division of ShawCor Ltd.

Head Office
25 Bethridge Rd.
Toronto, ON M9W 1M7 Canada
Tel: +1 416 743 7111
Fax: +1 416 743 5927

Canada
Suite 3200, 450 - 1st Street S.W.
Calgary, AB T2P 5H1 Canada
Tel: +1 403 218 8207
Fax: +1 403 264 3649

Americas
2408 Timberloch Place, Building C-8
The Woodlands, TX 77380 USA
Tel: +1 281 367 8866
Fax: +1 281 367 4304

Europe, Middle East, Africa & Russia
Unit 3, Sterling Park,
Gatwick Road, Crawley, West Sussex
RH10 9QT United Kingdom
Tel: +44 1293 541254
Fax: +44 1293 541777

Asia-Pacific
101 Thomson Road,
#11-03 United Square
307591 Singapore
Tel: +65 6749 8918
Fax: +65 6749 8919

Canusa-CPS is registered to ISO 9001:2008

Canusa warrants that the product conforms to its chemical and physical description and is appropriate for the use stated on the product data sheet when used in compliance with Canusa's written instructions. Since many installation factors are beyond our control, the user shall determine the suitability of the products for the intended use and assume all risks and liabilities in connection therewith. Canusa's liability is stated in the standard terms and conditions of sale. Canusa makes no other warranty either expressed or implied. All information contained in this data sheet is to be used as a guide and is subject to change without notice. This data sheet supersedes all previous data sheets on this product. E&OE

PDS_Wrapid Shield™ XL/XL-FC_rev010

CANUSA-CPS

Pipeline corrosion Protection

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/29/2015

Subject: Pipe surface preparation for shrink sleeves weld coating

Directive Number: 2015 – 010

Pipe surface preparation for Shrink Sleeves will be sandblasting using the SSPC-SP10 or NACE 2- Near-White Blast Cleaning Specificiation.

Method of surface preparation shall continue to be recorded for each weld.

Issued by (print): Christopher LeForce

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/30/2015

Subject: Adhesion Testing – Field Coating

Directive Number: 2015 - 011

An adhesion test shall be performed on an average of 2% of epoxy coated welds from April 1st through September 30th and 5% of epoxy coated welds from October 1st through March 31st, as well as on a minimum of one coated weld in the string for each HDD installation.

The instructions for completing these tests, "**QA/QC Adhesion Test for Field Applied Coatings (Revision 0)**," is attached to this directive.

Any questions on adhesion should be directed to Christopher LeForce or Eric Curtis.

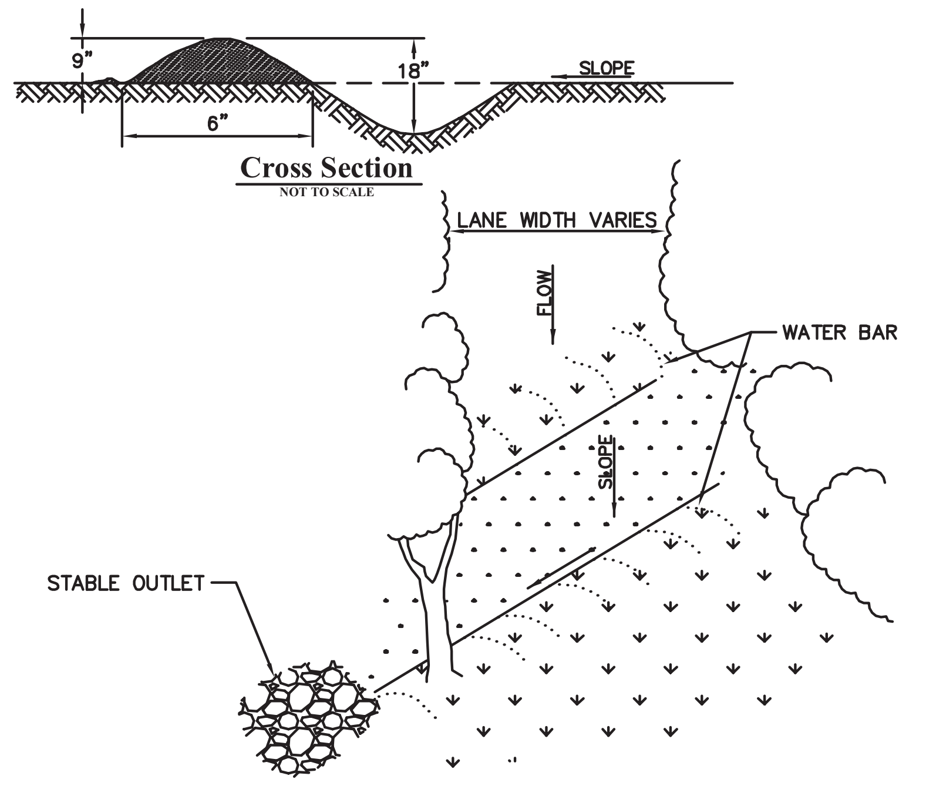
This directive supercedes directive 2015- 008.

Issued by (print): Christopher LeForce

Signature:

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Attachment 3



Construction Specifications

1. INSTALL THE WATER BAR AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
2. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
3. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
4. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.
5. FOR PERMANENT WATER BARS, VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE SEEDED AND MULCHED. FOR TEMPORARY WATER BARS, VEHICLE CROSSING SHALL BE COMPACTED AND MAINTAINED PER THESE SPECIFICATIONS. FOLLOWING THEIR USE, WATER BARS SHALL BE REGRADED TO MATCH PRE-CONSTRUCITON CONDITIONS. TOPSOIL SHALL BE RE-APPLIED THEN ALL AREAS OF EXPOSED SOIL SHALL BE FULLY STABILIZED PER THE EPSC PLAN.
6. INSPECT WATER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.
7. SPACING:

SLOPE (%)	SPACING (FT)
<5	125
5–10	100
10–20	75
20–35	50
>35	25

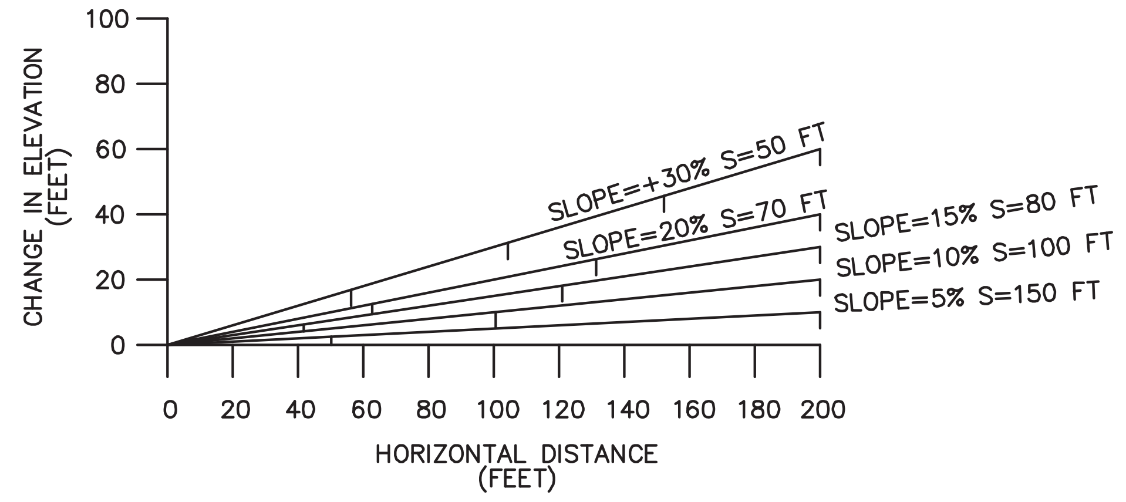
1 Water Bars

10/13

N.T.S.

Source: Vermont Standards and Specs for EPSC 2006

LD_



NOTE: S = TRENCH BREAKER SPACING

NOTES:

1. PERMANENT TRENCH BREAKER SANDBAGS SHALL NOT BE FILLED WITH TOPSOIL.
2. SPACINGS SHOWN ARE RECOMMENDED MINIMUM GUIDELINES. OSPC REPRESENTATIVE MAY ADJUST SPACING IN THE FIELD WITH PRIOR WRITTEN APPROVAL OF OWNER.
3. ONE TRENCH BREAKER IS REQUIRED AT ALL STREAM BANKS AND AT WETLAND BOUNDARIES.

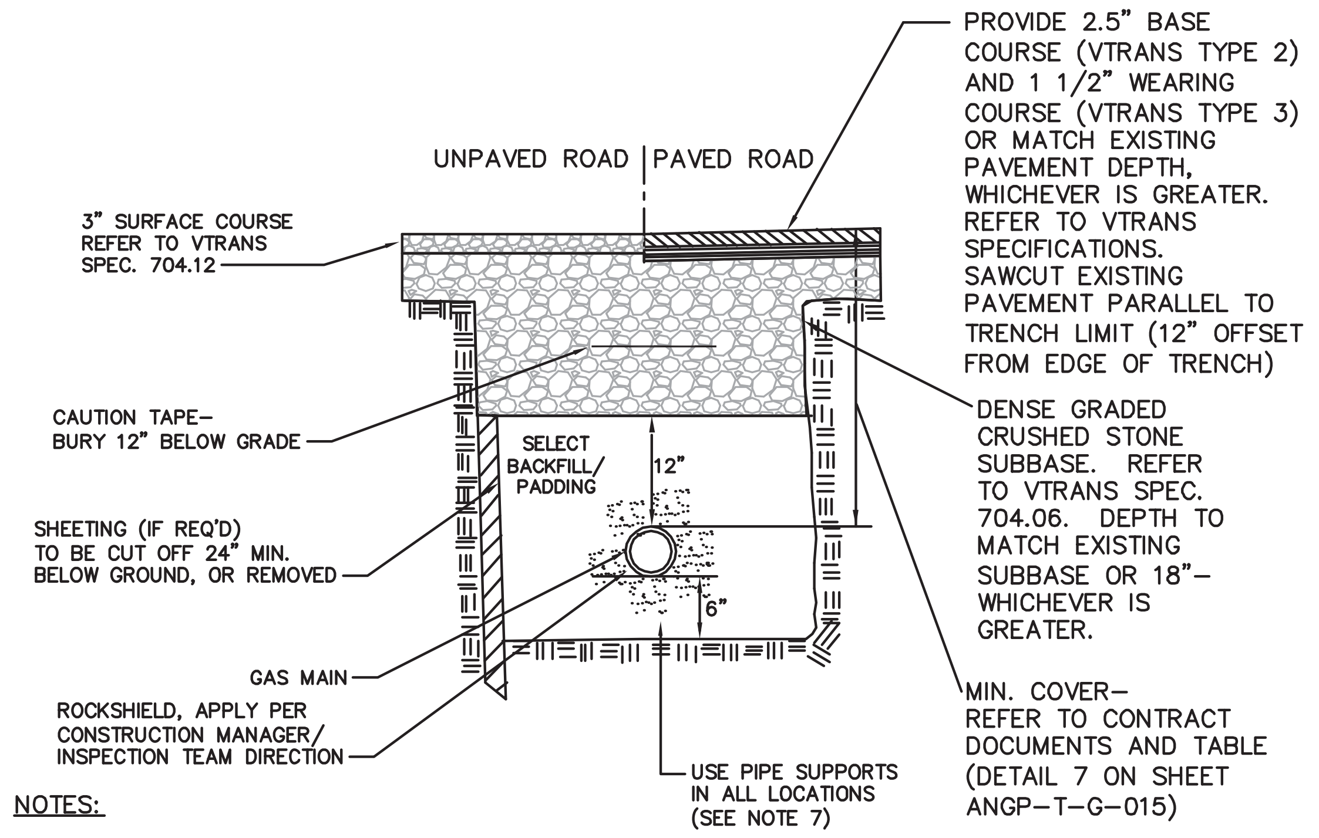
2 Permanent Trench Break Spacing Guideline

12/12

N.T.S.

Source: CHA

LD_



NOTES:

1. UNLESS OTHERWISE NOTED OR DIRECTED, SELECT BACKFILL MATERIAL SHALL CONSIST OF NATIVE MATERIAL CONTAINING STONES NO LARGER THAN 1.5" IN THE LONGEST DIMENSION. A SHAKER BUCKET OR SCREEN MAY BE USED IF NATIVE MATERIAL IS TOO LARGE. SAND MAY BE REQUIRED FOR SELECT BACKFILL IF DIRECTED BY CONSTRUCTION MANAGER/ INSPECTION TEAM.
2. IN AREAS OF ROCK OR UNSUITABLE SOILS OR AS DETERMINED BY CONSTRUCTION MANAGER, PIPE SHALL BE BEDDED WITH COMPACTED SELECT BACKFILL. WHEN NATIVE MATERIALS ARE UNSUITABLE FOR BACKFILLING, AS DIRECTED BY CONSTRUCTION MANAGER, CONTRACTOR SHALL BACKFILL WITH COMPACTED SAND TO 12" ABOVE TOP OF PIPE. THE REMAINING TRENCH SHALL BE BACKFILLED WITH AN APPROVED MATERIAL.
3. IN RESOURCE AREAS (E.G. WETLANDS AND PAS AREAS) GENERAL BACKFILL SHALL BE NATIVE MATERIAL TO MATCH PROFILE DEPTH OF ADJACENT NATIVE, UNDISTURBED SUBSOIL/SURFACE SOIL INTERFACE. EXCESS SUBSOIL TO BE PROPERLY DISPOSED OF AND STABILIZED.
4. THE OWNER SHALL PROVIDE TESTING SERVICES TO INSURE THAT THE IN-PLACE DENSITY OF THE BACKFILL MEETS REQUIREMENTS DETERMINED IN THE SPECIFICATIONS.
5. ALL TRENCH CONSTRUCTION SHALL CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
6. CONTRACTOR SHALL ENSURE BACKFILL IS PLACED/COMPACTED IN 12" (MAX) LIFTS ABOVE THE PIPE.
7. PROVIDE SUPPORTS IN ALL LOCATIONS (PIPE PILLO, STACKED SAND BAGS, OR OWNER APPROVED EQUAL). SUPPORTS SHALL BE SECURE AND STABLE AND ADEQUATE TO SUPPORT PIPE DURING LOWERING AND BACKFILL OPERATIONS.

3 Typical Trench Detail-Roadways and Driveways

11/14

N.T.S.

Source: CHA

LD_

CHA PLAN SHEET #	TOWN	PROJECT COMPONENT	PLANT ID CODE	STATE RANK	MATTING LOCATIONS (STATION)
ANGP–EPSC–014	WILLISTON	TRANSMISSION (ACCESS ROAD)	2012–RTE–CT–03 1	S2/S3	366+50 TO 368+75 AND ON ACCESS ROAD
ANGP–EPSC–022	WILLISTON	TRANSMISSION	2012–RTE–CT–08 4	S2/S3	562+50 TO 563+75
ANGP–EPSC–039	HINESBURG	TRANSMISSION	2012–RTE–CT–08 0	S2/S3	992+80 TO 993+50
ANGP–EPSC–039	HINESBURG	TRANSMISSION	2012–RTE–CT–08 1	S2/S3	1001+20 TO 1002+20
ANGP–EPSC–039	HINESBURG	TRANSMISSION	2012–RTE–CT–08 2	S2/S3	1003+50 TO 1005+80
ANGP–EPSC–040	HINESBURG	TRANSMISSION	2012–RTE–CT–04 1	S2/S3	1021+20 TO 1023+00
ANGP–EPSC–051	MONKTON	TRANSMISSION	2012–RTE–ACT–0 83	S2/S3	1302+10 TO 1307+90
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–CT–05 1	S2/S3	1649+50 TO 1652+00
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–CT–06 1	S2/S3	1665+50
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–AT–05 3	S1	1659+60
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–LV–05 4	S2	1659+60
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–AT–06 3	S1	1669+70 TO 1670+50
ANGP–EPSC–075, 079, 077	NEW HAVEN	TRANSMISSION	2012–RTE–CT–06 9	S2/S3	1918+00 TO 1966+50
ANGP–EPSC–V011	FERRISBURGH	DISTRIBUTION MAIN	2012–RTE–CT–06 8	S2/S3	118+80 TO 119+10

Notes:

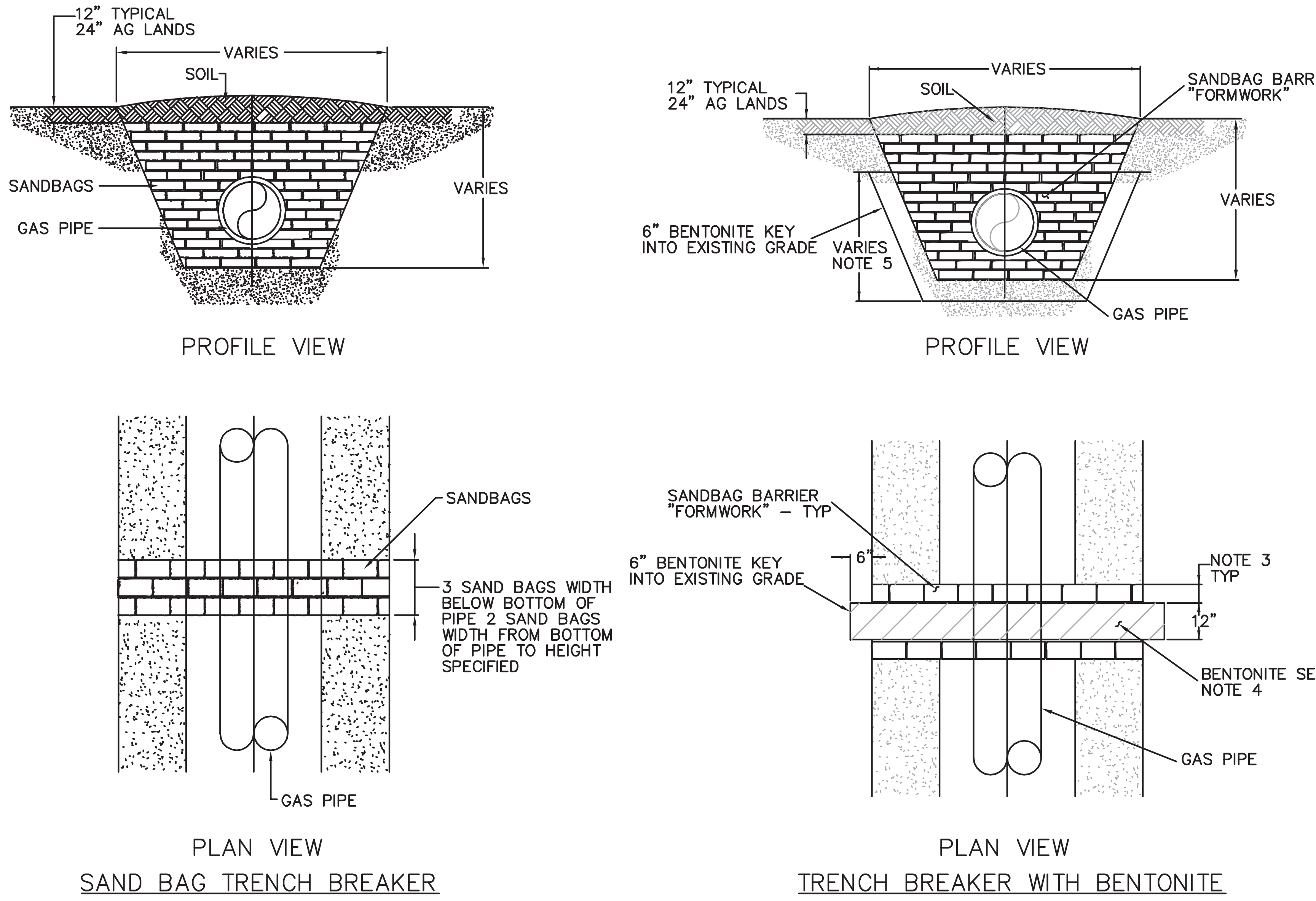
1. INSTALL CONSTRUCTION MATS ON STATION LOCATIONS LISTED IN TABLE TO PROTECT RARE PLANT SPECIES.
2. LIMIT DURATION OF MATTING DURING GROWING SEASON TO EXTENT PRACTICABLE.
3. REMOVE MATTING IMMEDIATELY FOLLOWING THEIR USE. FOR EXAMPLE, WHERE MATTING IS USED FOR TEMPORARY STOCKPILING OF SOIL FROM TRENCHING OPERATIONS, REMOVE MATTING IMMEDIATELY FOLLOWING BACKFILL OPERATIONS.
4. AT A MINIMUM, MATTING IS NOT TO BE LEFT IN PLACE FOR MORE THAN 28 DAYS WHERE FEASIBLE.
5. REFER TO ADDITIONAL ENVIRONMENTAL NOTE 12 ON SHEET ANGP–T–G–011

4 RTE Matting Table

09/13

N.T.S.

Source: VHB



PLAN VIEW
SAND BAG TRENCH BREAKER

PLAN VIEW
TRENCH BREAKER WITH BENTONITE

NOTES:

1. PERMANENT TRENCH BREAKER WITH BENTONITE SEAL IS INTENDED TO PROHIBIT WATER FLOW THROUGH THE BREAKER.
2. PERMANENT TRENCH BREAKER WITH BENTONITE SEAL TO BE INSTALLED AT EDGE OF WETLANDS AND STREAMS.
3. SAND BAG BARRIER WIDTH SHALL BE MINIMUM 1 BAG WIDE AND/OR AS FIELD DETERMINED TO PROVIDE STABILITY.
4. BENTONITE IS TO BE INSTALLED IN THE VOID SPACE BETWEEN THE SANDBAG BARRIER "FORMWORK" IN SUCH A MANNER TO COMPLETELY SURROUND THE PIPE AND FILL THE VOID FROM THE BOTTOM OF THE TRENCH TO A HEIGHT 6" ABOVE THE LEVEL OF IMPORTED PADDING MATERIAL WHICH IS INSTALLED ON THE EXTERIOR SIDE OF THE SANDBAG BARRIER IN THE WETLAND ZONE.
5. AFTER BENTONITE PLACEMENT, INSTALL SAND BAGS ON TOP OF THE PERMANENT TRENCH BREAKER AND BENTONITE SEAL TO THE REQUIRED HEIGHT PER DETAIL 2 AND BACKFILL EXTERIOR SIDES OF SAND BAG BARRIERS.

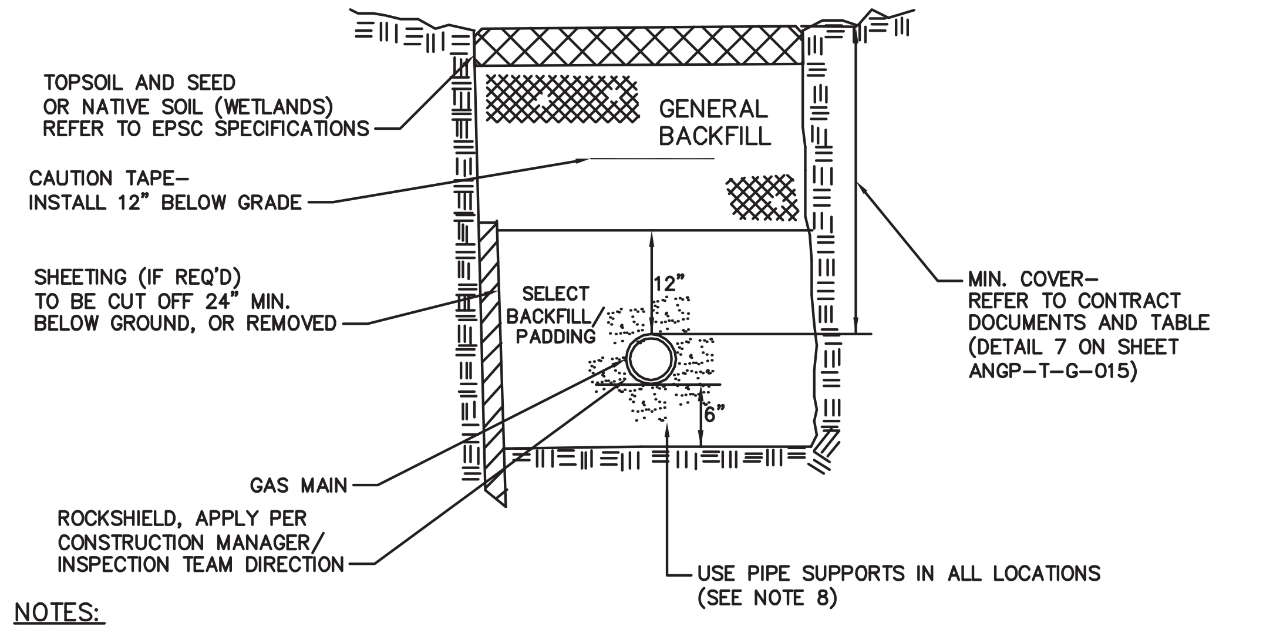
5 Permanent Trench Break or Sandbags

12/12

N.T.S.

Source: CHA

LD_



NOTES:

1. UNLESS OTHERWISE NOTED OR DIRECTED, SELECT BACKFILL MATERIAL SHALL CONSIST OF NATIVE MATERIAL CONTAINING STONES NO LARGER THAN 1.5" IN THE LONGEST DIMENSION. A SHAKER BUCKET OR SCREEN MAY BE USED IF NATIVE MATERIAL IS TOO LARGE. SAND MAY BE REQUIRED FOR SELECT BACKFILL IF DIRECTED BY CONSTRUCTION MANAGER/ INSPECTION TEAM.
2. UNLESS OTHERWISE NOTED OR DIRECTED, GENERAL BACKFILL MATERIAL SHALL CONSIST OF NATIVE MATERIAL CONTAINING NO STONES OR CLODS LARGER THAN 3" IN THE LONGEST DIMENSION.
3. IN AREAS OF ROCK OR UNSUITABLE SOILS OR AS DETERMINED BY CONSTRUCTION MANAGER, PIPE SHALL BE BEDDED WITH COMPACTED SELECT BACKFILL. WHEN NATIVE MATERIALS ARE UNSUITABLE FOR BACKFILLING, AS DIRECTED BY CONSTRUCTION MANAGER, CONTRACTOR SHALL BACKFILL WITH COMPACTED SAND TO 12" ABOVE TOP OF PIPE. THE REMAINING TRENCH SHALL BE BACKFILLED WITH AN APPROVED MATERIAL.
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6 Typical Trench Detail-Cross Country

11/14

N.T.S.

Source: CHA

LD_

1

PIPELINE MINIMUM COVER REQUIREMENTS	
AREA	COVER
VELCO ROW OR ROW ACCESS POINT	4'
VTRANS ROW*	4'
AG AREAS*	4'
PAVED AREAS	5'
BOTTOM OF DITCHLINE	4'
STREAMS	5' MIN. UNLESS OTHERWISE NOTED ON SHEET ANGP–T–G–017
ALL OTHER AREAS*	3'

*UNLESS OTHERWISE NOTED ON APPROVED PERMIT PLANS OR CONSTRUCTION LINE LIST

7 Typical Minimum Cover of Pipeline

11/14

N.T.S.

Source: CHA

LD_

		1	BCK	TDB		DEPTH OF COVER UPDATE (6/11/15)
DWG. NO.	REFERENCE DWG.	REV	DSN	CK		DESCRIPTION

	BID		CONSTRUCTION	
ENVIRONMENTAL	JLS	06/28/13	JLS	04/02/15
DRAFTING DESIGNER	GIL	06/28/13	GIL	04/02/15
DRAFTING SUPERVISOR	BZD	06/28/13	BCK	04/02/15
DESIGN ENGINEER	MDF	06/28/13	TDB	04/02/15
DESIGN MANAGER	SAB	06/28/13	JEO	04/02/15
	INITIALS	DATE	INITIALS	DATE

VERMONT GAS
PROPOSED 12" PIPELINE
ADDISON NATURAL GAS PROJECT
CONSTRUCTION DETAILS

LOC. CHITTENDEN & ADDISON COUNTIES

YEAR: 2015 | W.O. | SCALE: NOTED | DWG. ANGP–T–G–015 | REV. 1

Vermont Gas

Vanasse Hangen Brustlin, Inc.

CHA
38 Eastwood Drive, Suite 105
South Burlington, VT 05403
Main: (802) 735-0372 · www.chacompanies.com

Attachment 4

The Blacksmith Group

February 27, 2018

Mr. John St. Hilaire
Vice President, Engineering and Operations
Vermont Gas Systems, Inc.
85 Swift Street
South Burlington, VT 05403

RE: Addison Natural Gas Project

Dear John,

I am writing to provide my opinions regarding certain aspects of the construction of the Addison Natural Gas Project ("ANGP"), which have been raised in the Vermont Department of Public Service's ("Department") February 16, 2018 NOPV ("NOPV"). I understand that Vermont Gas Systems, Inc. ("VGS") will likely agree to the remedial actions requested by the Department in order to close out the many discussions VGS has had with Department personnel on the subjects of the NOPV throughout construction, but that VGS management wanted my independent assessment of the company's performance on these matters and the Department's recommended remedial action. I will begin by providing a summary of my background and experience.

<u>Background/Experience in the Industry</u>
I have worked in the energy and chemicals industry for 38 years. I have spent the last 24 years working in the energy pipeline industry as a consultant on matters related to pipeline design, construction, operations, maintenance, and integrity management. I worked for the Hartford Steam Boiler Inspection and Insurance Co. for 22 years, serving as the General Manager and Senior Vice President of the Worldwide Chemical, Oil and Gas Insurance Operations for five years. I was one of the founders of Process Performance Improvement Consultants and subsequently the holding company, the Blacksmith Group, where I work today.

I have advised company boards by leading independent investigations and proposing long-term plans following major accidents for Pacific Gas & Electric, Olympic Pipeline, El Paso Corporation and Colonial Pipeline. I advised the external directors of Longhorn Pipeline when they first sought financing in reversing flow on their system. I also served as a lead advisor for Entergy following Hurricane Katrina as they worked to emerge from bankruptcy and then successfully realized claims for major damage to their gas distribution system. I have also testified before the House Energy and Commerce Committee during Pipeline Safety Reauthorization Hearings in 2002.

I have led a number of construction-related initiatives within the INGAA Foundation since 2007. I was the technical lead in the development of a Primer on Natural Gas Pipeline Construction. The primer describes each step of construction, what is done, why it is done to ensure worker safety and protect the pipeline during construction. I have led workshops on improving construction and inspection including coating and welding. I was the technical lead on development of guidance of construction quality management systems.

I have conducted audits of construction projects including reviews of procedures, observation of work, reviews of records and interviews of construction workers and inspectors. The audits have entailed evaluation of compliance with applicable federal and state regulations.

Response to Department's NOPV

The Department and VGS have differing interpretations regarding whether VGS' installation methods at locations noted in the NOPV conformed with VGS construction specifications. The Department has asserted that the contractor utilized trenching and installation techniques that differed from those set forth in VGS' specifications. Based on my experience, the methods described in construction specifications are the ones that *generally* are used to construct a pipeline. However, there can be, and often are, circumstances that arise during construction related to topography, soil type(s), the presence of water, environmentally sensitive areas such as wetlands among others, that require adjustments to work methods be made during actual construction to safely construct the pipeline. These adjustments are referred to as "field adjustments". They are conducted in a manner to meet Federal pipeline safety regulations and the intent of the project specifications, but the exact steps taken will differ from the specifications and drawings.

For example, the specifications contain drawings referred to as "Typicals," as do most construction specifications with which I am familiar.   The diagrams show how typical construction is undertaken but do not foresee all possible circumstances that will be encountered during construction. Because field adjustments are a known and routine aspect of construction, this also means that not every single aspect of a construction project will have a written specification. However, this does not mean that 49 CFR § 192.303 is not met because the regulation does not mean that every single field condition and alternative must be delineated in a written specification. Based on my knowledge of the ANGP work, I believe that VGS' actions described in the NOPV did comply with 49 CFR § 192.303, Compliance with Specifications or Standards.

In addition, the Department reports that it is concerned that the way the pipeline was installed in certain locations may have increased its susceptibility to corrosion due to differing soil conditions above and below the pipe, and unknown materials in the soil below the pipe. I have reviewed the white paper by Mr. Bushman, which the Department has previously referenced, and do not agree that that the mere presence of differing soil conditions above and below the pipe results in an increased susceptibility to corrosion, particularly where cathodic protection is used. There will often be differing soil types in an excavation made for a pipeline trench. Topsoil is typically segregated during excavation from remaining soil in the trench to preserve its characteristics for its intended land use. There may also be naturally occurring differing soil types in the material excavated. Regardless of soil type, in addition to the pipe coating, cathodic protection is applied to the pipe to protect it from external corrosion. The amount of current applied is adjusted to meet the performance standards for external corrosion control set forth in Subpart I of 49 CFR § 192. It is my understanding that VGS will conduct an annual survey of test points, locations along the pipeline, to assess compliance with the Subpart I requirements. In areas where the requirements are not meet, the cathodic protection system is adjusted or enhanced to ensure that the performance specifications are met. Soil types are taken into account in initial design of the cathodic protection system and the annual surveys enable the operator to adjust to meet the requirements.

In my opinion, several of the remedial actions requested by the Department are more conservative than expected for a newly constructed pipeline. Specifically, Department asks that "if metal loss of greater than 20% is noted, the mitigation shall take place within 3 months of discovery." First, the 20 percent threshold is quite conservative, but I understand VGS aims to be diligent and mitigate these findings. I do agree with the value of that but suggest that for a number of reasons the mitigation timeframe be extended to one year. First a metal loss at 20% does not raise a safety concern. Second, a twelve month time period will allow VGS to plan, contract and execute work most effectively, including minimizing disturbance of soil and vegetation around the pipe by planning work to take into account weather and seasonal issues.

The Department also requests that VGS conduct a coating survey, either using a direct current voltage gradient ("DCVG") or alternating current voltage gradient ("ACVG") survey every five years, in conjunction with in-line inspection and a close interval survey. VGS has already proactively conducted a DCVG survey and did not find actionable indications, which is evidence that the installation methods did not result in damage to the coating. I am unaware of any operator of a newly installed pipeline that has conducted a follow-up coating survey except in those areas that were remediated. A follow-up coating survey in five years offers little to no value in ensuring the integrity of ANGP. The annual surveys and close interval survey will indicate where cathodic protection needs mitigation and when integrated with in-line inspection results, directed at identifying corrosion, will accomplish what the coating survey might show and it will do so more effectively. There could be value in a coating survey at some future date but it would be based on evaluation of the integrated annual survey, close interval survey and in-line inspection data.

Let me know if you have any questions.

Sincerely,

Mark L. Hereth
Managing Director
3939 West Alabama, Suite 567
Houston, Texas 77027
(713) 294.6650

Attachment 5

SECTION 312333 - TRENCHING, PIPE LAYING AND BACKFILLING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the excavation of trenching, pipe laying, backfilling, compacting, dewatering, excavation support and disposal, as shown on the Contract Drawings, and as herein specified.

B. The Construction Management Team will determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 QUALITY ASSURANCE

A. Reference Standards:

1. The latest edition of the following standards, as referenced herein, shall be applicable.

    a. "Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)."

    b. American Society for Testing and Materials (ASTM).

    c. Vermont Agency of Transportation (VTrans) Standard Specifications

B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State.

C. The Owner shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications, in accordance with Section "Quality Requirements."

1.3 SUBMITTALS

A. The Contractor shall submit certified gradation curves and moisture-density compaction results for each imported material. If multiple sources are utilized, information shall be submitted from each individual supplier.

B. Pipe support systems: Contractor shall submit method of pipe support system(s) to be utilized, including details on how supports will be installed.

C. Contractor shall submit details/designs for all shoring and trench boxes for excavations that exceed 20’ in depth. Details and designs shall be sealed by a registered Vermont Professional Engineer.

1.4 PROJECT REQUIREMENTS

A. Call Dig Safe at 811 before starting any excavation or verify that a Dig Safe ticket exists and is valid for the area. Contractor shall maintain Dig Safe marks and follow all Dig Safe laws. Contractor is responsible for contacting and complying with municipal and private utilities that are not members of Dig Safe. Excavate with care to avoid damage to structures and utilities - excavations shall be completed by hand if necessary. Promptly report any damages to utilities to Utility Owner and Construction Management Team, do not attempt repairs without the Utility Owners consent.

B. Notify the Construction Management Team and Owner of any unexpected subsurface condition.

C. Protect excavations by shoring, bracing, sheet piling, or by other methods, as required to ensure the stability of the excavation. Comply with VOSHA/OSHA requirements.

D. Underpin or otherwise support structures and improved surfaces adjacent to the excavation which may be damaged by the excavation. This includes service lines and existing utilities.

E. Contractor is responsible for protection of Existing Utilities:

1. Specifically, Contractor shall use extreme protection around existing 10-inch transmission main in the vicinity of the Colchester Tie-in Site. This is the primary feed for the Burlington area. Owner will locate/flag the line prior to Contractor beginning work in this area. Contractor shall take all measures necessary to protect this existing transmission main during construction. The Owner must be present for any work or excavation around the existing 10-inch transmission main.

2. Contractor will notify Owner before excavating around, or crossing, any existing natural gas distribution lines. Owner will determine if Owner should be present during any work.

3. Locate existing underground and above ground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.

4. If necessary, coordinate interruption and/or termination of utilities with the utility companies and the Owner.

5. Provide a minimum of seven days notice to the Owner and receive written notice to proceed before interrupting any utility.

F. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified.

G. Repair any damaged utilities as acceptable to the Owner, Construction Management Team, and utility companies at no additional cost to the Owner.

H. Contractor shall comply with maintenance and protection requirements as approved by the authority having jurisdiction.

I. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post with warning lights, if required or comply with any applicable permits.

2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by construction operations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Select Backfill/Pipe Padding:

1. On-site material: The use of on-site native material for select backfill/pipe padding shall be approved and inspected by the Construction Management Team. Native material shall not contain any stones that are larger than 1.5" in the longest dimension, or that contain sharp/angular pieces that may impact pipe coating integrity. Native material that consists of fractured/processed rock that has been blasted or mechanically removed cannot be utilized as select backfill material due to the angularity of the material, unless used in conjunction with Tuff-N-Nuff 11 mm Rockshield installed per the manufacturer's recommendations. A shaker bucket or screen may be used if native material is too large, given that the characteristics of the material are suitable for successful shaker bucket or screen use.

2. Borrow Material: If native material is not acceptable as determined by the Construction Management Team, a sand material shall be imported to the site meeting the following criteria. Alternate select backfill/pipe padding materials may be submitted by the Contractor for review and approval from Construction Management Team.

Sieve	**Percent Passing**
1-1/2"	100
½"	70 - 100
No. 4	50-100
No. 100	0-20

B. General Backfill: Native materials containing no stones or clods larger than ***6***" in the longest dimension are acceptable. If native material is not acceptable, as determined by the Construction Management Team, bank run gravel fill shall be imported to the site meeting the following criteria. General backfill area will be limited to the trench, or a maximum of 12-inches laterally from each side of the pipe. Alternative general backfill materials may be submitted by the Contractor for review and approval from Construction Management Team.

Sieve	**Percent Passing**
6"	100
No. 4	20 - 60
No. 100	0 -12
No. 200	0 - 6

PART 3 - EXECUTION

3.1 PRECONSTRUCTION MATERIAL QUALIFICATION TESTING

A. General:

1. Sufficient size samples shall be obtained from the potential borrow source to allow completion of tests listed in paragraph B below. Samples may be obtained from test borings, test pits, or from borrow pit faces provided that surficial dry or wet soil is removed to expose undisturbed earth. Tests listed below shall be performed on each sample obtained. A minimum of three (3) representative samples from each potential borrow source shall be furnished to the testing laboratory for prequalification testing.

B. Material Tests:

1. Particle Size Analysis:
    a. Method: ASTM D422
    b. Number of Tests: One (1) per sample; three (3) per potential source.
    c. Acceptance Criteria: Gradation within specified limits.
2. Maximum Density Determination:
    a. Method: ASTM D1557 - Modified Proctor
    b. Number of Tests: One (1) per sample; three (3) per potential source.
3. Re-establish gradation and maximum density of fill material if source is changed during construction.

3.2 PREPARATION

A. Establish required lines, levels, contours and datum.

B. Maintain benchmarks and other elevation control points; re-establish if disturbed or destroyed, at no additional cost to the Owner.

C. Establish location and extent of existing utilities prior to commencement of excavation.

3.3 EXCAVATION

A. All excavation shall be made to such depth/width as required to provide suitable room for laying pipe and for sheeting, shoring, pumping and draining as necessary, and for removing peat, silt, or any other deleterious materials which the Construction Management Team may deem unsuitable. Hand trench excavation may be required to protect existing utilities and structures.

B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Contract Drawings. Excavation shall be made to such a depth and to the width indicated on the Contract Drawings so as to allow a minimum of six (6) inches of select backfill / padding to be placed beneath and on the sides of all pipes installed unless otherwise specified on the drawings. A minimum of twelve (12) inches of select backfill/padding shall be placed above all pipes installed.

C. The bottom of the trench shall be accurately graded to provide a uniform layer of padding/bedding material, as required, for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.

D. Stockpile excavated subsoil for reuse where directed or approved.

E. Over excavation/under cut: If, in the opinion of the Construction Management Team, existing material below the trench grade is unsuitable for properly placing select backfill/padding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved select backfill/padding material properly compacted.

F. Stability of Excavation: Slope sides of excavations shall comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavation in safe condition until completion of backfilling.

G. Removal of materials beyond the indicated elevations, without authorization by the Construction Management Team, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

H. If a trench excavation crosses a road, sidewalk, bike path, driveway, or other transportation facility, the Contractor shall arrange temporary facilities for ingress/egress of all pedestrians and vehicles. One lane of traffic shall be maintained at all times – refer to VTrans/Local permits for additional construction conditions and traffic management details.

3.4 DEWATERING

A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the work is completed and excavation is backfilled or have sufficient weight to resist uplift pressures. Groundwater levels shall be depressed to a minimum of 2 feet below excavation subgrade. No pipe or structure is to be laid in water and water shall not be allowed to rise on or flow over any pipe or structure until such time as approved by the Construction Management Team.

B. Provide a suitable point of discharge from dewatering operations shall be conveyed in a non erosive manner satisfactory to the EPSC Specialist and Construction Management Team and all applicable environmental permit regulations.

C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected to the satisfaction of the Construction Management Team.

3.5 BEDDING AND BACKFILLING

A. Contractor shall take all necessary precautions to ensure that backfill materials are kept free of all skids, stumps, welding rods, cans, bottles, trash and other deleterious debris.

B. Pipe supports may be installed in all locations prior to backfilling as an alternative to continuous pipe bedding for the entire width of the trench. However, areas around pipe shall still be padded with select backfill as shown on the contract drawings and explained in paragraph 3.3.b. above. Stacked sandbags, pipe pillows, or owner approved equal are acceptable methods. Spacing shall be per manufacturer recommendations, if a commercial product, or 15' maximum separation if sandbags.

C. Trench breakers shall be installed per construction plan details prior to backfilling operations begin.

D. All pipe trenches backfill (select backfill/padding, general backfill, subbase) shall be thoroughly compacted by mechanical means as follows:

1. Typical Cross-country areas: Thoroughly compacted by mechanical means to avoid any future trench settlement. ***Use of excavator buckets and equipment tracks is acceptable for compaction in these areas only.***
2. VELCO corridor: All backfill in pipe trenches in the VELCO corridor shall be compacted to a minimum of 90 percent of modified Proctor maximum dry density by installing 12-inch (maximum) loose lifts.
3. Existing and Proposed Road Areas (unpaved and paved): All backfill in pipe trenches in, or directly adjacent to (with 10’ of edge of road surfaces – existing or proposed) road surfaces, shall be compacted to a minimum of 95 percent of modified Proctor maximum dry density. Backfill materials shall be placed with water content within plus or minus 3 percent of optimum moisture content per the modified Proctor method (ASTM D1557). Any water used for compaction shall be provided by the Contractor at their own expense. The Contractor is responsible for the repair of any trench settlement at no expense to the Owner for the period of one year after substantial completion of the project.

E. Provide uniform bearing and support for pipe in all locations, except where necessary to excavate for connections, tie-ins, and other required appurtenances. Dig no deeper, longer, or wider than needed to make the joint connection properly.

F. The bedding/padding material shall be placed to the full width of trench. The bedding material shall be placed evenly along the bottom of the trench to provide proper support of the pipe to the elevation shown on the Contract Drawings or directed by the Construction Management Team. . The backfill shall be placed on both sides of the pipe at the same time and to approximately the same elevation. Any pipe that is damaged or moved out of alignment, regardless of cause, shall be replaced or realigned at the Contractor's expense. Bedding/padding shall be thoroughly compacted by hand-tamping or mechanical means being careful not to damage the pipe. When the bedding/padding reaches one (1) foot over the top of the pipe, the entire surface shall be compacted by mechanical means.

3.6 PIPE STRINGING & LAYING

A. Pipe shall be installed per the depth, alignment, and coating type shown on the project design plans. Depth of cover shall be measured from top of pipe to finished/final grade (after site restoration). ***Horizontal tolerance for final location of installed pipe compared to design plans/survey layout shall be +/- 1.0’. Minimum depth of cover shall be strictly adhered to (no vertical tolerance for less cover than noted on plans).***

B. Stringing

1. No pipe shall be strung before the trench is excavated to full depth and accepted by the Owner to meet the requirements of this specification. Pipe shall not be placed directly on the ground, but on wooden skids with proper protective padding. The skids and protective padding material shall be subject to Construction Management Team approval. Dragging, skidding or dropping the pipe is not permitted. Wooden wedges shall be used to prevent movement of each strung pipe.

2. Where possible the skid elevations shall be planned such that minor differences between grade profile and bottom of trench profile (e.g. at locations where an increased trench depth is required) can be accommodated without an additional tie-in. The distance between the trench edge and the pipe string shall be planned such that safe working space is provided. Contractor shall follow applicable OSHA/VOSHA regulations.

3. Contractor shall be responsible for proper stringing and locating of the pipe by coating type.

4. Contractor shall string the pipe in such a manner so as to cause no interference with public roads, sidewalks, or bike paths. Suitable gaps shall be left at intervals as necessary to permit the passage of livestock and/or equipment across the right-of-way and as directed by the Construction Management Team.

5. Contractor shall layout and measure the pipes such that the number of pieces required to be cut-off with less than 5 feet in length is kept to a minimum.

6. Pipe shall be strung with the use of a spreader bar and two guide lines.

C. Bending - Contractor shall make all necessary field pipe bends required in construction of the pipeline. The Contractor shall be responsible for determining the degree of the field bend necessary where a change in direction is necessary.

1. All bending shall be completed using the cold smooth method using a bending machine, approved by the Construction Management Team. Wrinkle bends will not be acceptable. Welded longitudinal pipe seams shall be right angles (neutral axis) to the direction of the bend. The Contractor shall use an internal bending mandrel to achieve smooth and undistorted bends. Padded bending shoes are required for coated pipe. Heating the pipe for bending purposes is not allowable. Prior to beginning work, Contractor shall submit and demonstrate their bending procedure, which shall conform to the recommendations of the manufacture of the bending machine. This procedure shall be approved by the Construction Management Team prior to beginning work.

2. For field cold bends, the longitudinal axis shall not be deflected more than 1-1/2 degrees in any length along the pipe access equal to the diameter of the pipe. The maximum diametrical reduction in a pipe bend shall not exceed 2-1/2% of the nominal pipe diameter. There shall be no deviation from the above requirements without prior written approval from the Construction Management Team. Individual approvals shall be obtained for each application.

3. The distance between centerline of bending points shall be such that there will be no distortion of the pipe or of the bend previously made and in no event shall be closer than seven (7) feet to the end of the joint of the pipe. When pipe is double jointed before bending, the bend shall not be closer than three (3) feet to the butt (girth) weld.

4. Bends shall not be straightened under any circumstances.

5. Pipe that is buckled, wrinkled, flattened, egged or gouged, as determined by the Construction Management Team, by bending operations shall be cut out and replaced at the sole expense of the Contractor. Hammering, the use of jacks, or other mechanical machinery to repair bucked or deformed pipe is prohibited. A buckle shall be defined as any anomaly in the contour of a bend which, when measured with a six (6) inch metal straight edge oriented on the longitudinal axis, yields a depression or void beneath the straight edge equal to, or greater than, 0.06".

6. For pipe line-up, the pipe shall be placed on skids with sufficient clearance between the bottom of the pipe and ground to accommodate the finishing weld. Pipe shall be handled in a manner to prevent damage to the pipe walls and shall be placed over or parallel to the ditch in such manner that when the pipe is lowered, the bends will rest in the ditch at the proper location. In the laying of the pipe other than seamless pipe, the longitudinal seams shall be offset by 20 degrees on adjoining pipes in the top 120 degrees of the pipe and welded sections shall be assembled and lowered into the trench so that the longitudinal seams will remain on the top 120 degrees of the pipe as laid. Exceptions shall be weld seams on side bends, which shall be located on top of the pipe, and weld seams on sag bends and over bends, which shall be located on either side of the pipe as laid.

7. Contractor shall make all necessary bends required for proper construction of the pipeline, following a trigonometric survey to establish the number and degree of bends required, to ensure that the installed pipe conforms to the contours of the excavated trench.

D. Welding – Refer to Specification 137000

E. Coating Weld Joints and Fittings – Refer to Specification 138000

F. Lowering – Prior to lowering the pipe into the trench, the Contractor shall ensure that all water, debris, skids, rocks, welding rods and other foreign or deleterious material is removed from the trench. During lowering operations coated pipe shall be handled by use of adequately spaced lowering belts or cradles, as determined to be acceptable by the Construction Management Team, but shall be a maximum of 250’. At a minimum, belts shall be equal to the outside diameter of the pipe and shall be made of material that is free of protrusions that may cause damage to the protective coating. Roller cradles shall have nylon/neoprene roller wheels. The pipe shall be lowered into the trench in a manner that will allow proportional distribution of the total weight of the pipeline to all of the lifting points to prevent undue stress or strain on the pipe and to prevent damage to the pipe coating. The pipe shall not be dropped or subjected to jarring or impact. At water crossings or any other locations which may require pulling or dragging of the pipe into place, the coated pipe shall be properly protected from damage using wood lagging or rollers. ~~Welded pipe strings shall be lowered-in within 96 hours of completion of joint coating.~~

G. Holiday Inspection – Holiday inspection (“jeeping”) shall be performed on all pipe and fittings with an electronic holiday detector, supplied by the Contractor and operated in such a manner to audibly and visually detect the presence of all holidays in the coatings. Jeeping shall be completed twice (minimum) – once when on skids adjacent to trench, and again as it is lowered into the ditch. Additional jeeping may be required as determined by the Construction Management Team. Refer to Coatings, Specification 138000 for additional jeeping requirements.

H. Rock Shield – Contractor shall furnish and install Tuff N Nuff 11 mm rockshield, or Construction Management Team approved equal, on the pipeline in areas of rock trench or as otherwise directed by Construction Management Team or utility inspector.

I. Trench Breakers – Trench breakers shall be installed as defined on the project design drawings.

J. Electrolysis Test Leads – Locations for test leads are determined on the project design drawings and shall be connected prior to backfilling operations – follow Cathodic Protection Details for installation. If an electrical continuity test fails after backfilling operations, Contractor shall excavate and replace test lead at no cost to the Owner. All test lead cables shall be continuous with without splices.

K. Drainage Tile Repair – Tiles within the limit of disturbance that are damaged shall be repaired by the Contractor.

1. The replacement tile shall be installed to the gradient and alignment of the previous tile. Tile shall be supported at trench crossings as necessary in order for the tile to maintain the gradient/alignment during backfilling operations.
2. Replacement tile materials shall be new. Reusing excavated existing drain tile is not acceptable.
3. Drain tile couplings shall be utilized to splice in new drain tile. Couplings shall be installed per the manufacturer’s recommendations.
4. During backfilling operations, soil adjacent to and under tiles shall be compacted to eliminate future settlement.
5. In areas where the tile alignment is parallel and directly adjacent to the pipeline alignment, the tile will be moved/offset to the side of the pipeline alignment.
6. Tile and pipeline separation shall be a minimum of 12-inches.
7. Conditions in construction line list regarding existing and future tile locations shall be adhered to by the Contractor.
8. If directed by Construction Management Team, both existing and replacement tiles shall be inspected to ensure that tiles are not plugged, crushed, mis-aligned, or otherwise damaged. If damage is found, tile shall be repaired at no cost to the Owner.

L. Warning Tape – Contractor shall install Owner provided pipeline warning tape as indicated on project design drawings.

M. Pipeline Markers – After completion of backfilling operations, Contractor shall install Owner supplied pipeline markers as directed by Construction Management Team.

3.7 BACKFILLING AROUND STRUCTURES

A. The Contractor shall not place backfill against any structure without obtaining the approval of the Construction Management Team. No dumping shall be allowed where materials would flow against or around such structures. Backfill material shall be deposited in horizontal layers not exceeding 6 inches in loose thickness or as shown on the Contract Drawings and thoroughly compacted by hand or by mechanical means to the satisfaction of the Construction Management Team.

3.8 SUSPENSION OF WORK

A. Whenever the work is suspended, excavations shall be protected and the roadways, if any, left unobstructed. Within or adjacent to private property, material shall be stored at such locations as will not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.9 DISPOSAL OF MATERIAL

A. Excess and unsuitable materials shall be legally disposed of by the Contractor off site at the Contractor’s expense unless otherwise approved by the Owner.

3.10 FIELD QUALITY CONTROL

A. Notify the Construction Management Team at least three (3) working days in advance of all phases of excavation and backfilling operations. The contractor shall not conduct backfilling operations unless the Construction Management Team is present for inspections. Backfilling operations shall commence as soon as possible after the pipe has been lowered into trench. The amount of lowered pipe that is not backfilled shall be kept at a minimum at all times. Contractor shall not backfill trench until the Owner's as-built survey crew has completed their necessary tasks.

B. In-place density testing at road crossings and VELCO corridor shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:

1. In-place relative density:

    a. Method: AASHTO T238, Nuclear Method

C. Perform initial density testing to verify that contractors proposed compaction effort will obtain the minimum required densities.

D. In-place density tests on trench backfills shall be provided as follows:

1. Open-cut road crossings: One test per lift and at least once daily.
2. Cross-country areas: Visual only – subject to Construction Management Team approval.
3. VELCO corridor: Minimum of one every 500 cubic yards of fill, and not exceeding every 2 feet vertically, or once daily.

E. The Construction Management Team may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions.

F. Acceptance Criteria: The criteria for acceptability of in-place fill shall be both visual and in-situ dry density and moisture content. If a test fails to qualify, the fill shall be further compacted and re-tested/inspected. Subsequent test failures shall be followed by removal and replacement of the material, at no cost to the Owner. Minimum compaction of backfill materials noted in Section 3.5.D of this specification.

END OF SECTION

Attachment 6

MEMORANDUM

TO: ANGP File

FROM: Adam Gero

DATE: June 6, 2017

RE: Addison Natural Gas Project (ANGP) Pipe Laid on Trench Bottom

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This memorandum serves as justification for Vermont Gas' decision to allow the areas on ANGP where pipe was laid directly on the trench bottom to remain in place.

During the construction of the ANGP pipeline, there were a few locations where the transmission pipe was installed directly on the trench bottom or supported by sand berms or "dutchmens". At the time of occurrence it was in compliance with Technical Specification Section 312333. After the occurrences, decisions were made to adopt more stringent construction practices and no longer allow these methods.

Order of events:
August 31, 2015 – Pipe was installed between station 240+26 and station 279+75 directly on the sandy bottom of the trench. This is documented in directive 2015-005 (attached) stating that the Construction Management Team deemed that the trench bottom had adequate support and padding. This practice was allowed by the Technical Specifications:

"Pipe supports shall be installed in all locations prior to backfilling, unless otherwise directed by the Construction Management Team – refer project design drawings for further requirements. Stacked sandbags, pipe pillows, or owner approved equal are acceptable methods. Spacing shall be per manufacturers recommendations, if a commercial product, or 15' maximum intervals if sandbags." – Technical Specification for ANGP, Section 312333 part 3.5B – April 29, 2015

June, 2016 – Construction began on ANGP south of the Williston Gat Station. Technical Specification 312333 part 3.5B had been revised 05/2016 to read:

"Pipe supports may be installed in all locations prior to backfilling as an alternative to continuous pipe bedding for the entire width of the trench. However, areas around pipe shall still be padded with select backfill as shown on the contract drawings and explained in paragraph 3.3.b. above. Stacked sandbags, pipe pillows, or owner approved equal are acceptable methods. Spacing shall be per manufacturer recommendations, if a commercial product, or 15' maximum separation if sandbags." – Technical Specification for ANGP, Section 312333 part 3.5B – May, 2016

MEMORANDUM

The Construction Management Team constructed the pipeline with the knowledge that pipe installed on the trench bottom or on sand berms was in fact an "owner approved equal" for pipe support. This is solidified by the (attached) email from Brendan Kearns, CHA Engineer to John St. Hilaire on June 22, 2016 where he stated "If the material 6" below the bottom of the trench is deemed to be suitable material (per specifications) by the CM team, then the pipe can be laid in the bottom of the trench as long as it is sufficiently supported as stated in 3.3.C". The only section that was installed directly on the trench bottom in 2016 was a 360 foot section between station 564+24 and station 567+84. VGS did a test dig in that section to inspect the pipe and to analyze the trench. The report (attached) shows that the soil at the bottom of the trench was suitable for padding material.

Further discussions on this matter ensued and on July 5th, 2016 the team decided that for consistency they would no longer allow pipe to be installed on the trench bottom or supported on sand berms. This is memorialized in RFI#: ANGP-VGS-RFI-025 (attached) and then communicated to the DPS in the (attached) email From Chris LeForce to GC Morris and Louise Porter on July 7th, 2016.

Another concern was also brought up regarding soil differences potentially causing corrosion issues. This concern was quickly handled by Jeremy Bachand, Vermont Gas Corrosion Technician, NACE CP2 certified, and Bob Allen, President and Owner of ARK Engineering, NACE CP4 certified. Their conversations clarified that the conditions present in the areas where the pipe was installed directly on the ground or on sand berms were similar to those elsewhere on the project and raised no extra corrosion concern. This was documented in an email from John St. Hilaire to GC Morris and Louise Porter on July 1st, 2016 (attached).

At the time that the pipe was installed either on the trench bottom or on sand berms it was acceptable practice. VGS and the Construction Management Team then decided to remove some of the flexibility in the construction methods. After this change was made, no additional pipe was installed on the trench bottom or on sand berms.

Areas Pipe Lays on Ground or Pipe Using Dirt Berms

Date	Station From	Station To	Sand Berms	Pipe on the Ground
8/31/2015	240+26	279+75		X
6/17/2016	564+24	567+84		X
6/18/2016	889+74	892+11	X	
6/21/2016	888+38	889+74	X	
6/28/2016	863+62	864+55	X	
7/5/2016	663+00	664+50	X	

Vermont Gas

ARNGP PROJECT DIRECTIVE

Date: 9/1/2015

Subject: Construction in Sand Area

Directive Number: 2015 - 005

In 3.5(B) – Bedding and Backfilling of Section 312333 – Trenching, Pipe Laying, and Backfilling of the Technical Specifications: pipe supports shall be installed in all locations prior to backfilling, unless otherwise directed by the Construction Management Team.

This document serves to direct the construction without pipe supports in the sand area from station 240+26 to station 279+75, as the uniform sand in the trench meets requirements for select backfill.

Issued by (print): John Stamatov

Signature: JR. St, Prj. Mgr

This directive expires on 12/31/2015 unless superseded or cancelled prior to that date.

Adam Gero

From: John St.Hilaire
Sent: Wednesday, June 22, 2016 9:53 AM
To: Adam Gero; Chris LeForce
Subject: FW: 312333 Trenching and Backfilling Clarification

FYI

From: Kearns, Brendan [mailto:BKearns@chacompanies.com]
Sent: Wednesday, June 22, 2016 9:37 AM
To: John St.Hilaire
Cc: 'john.r.stamatov@pwc.com'
Subject: 312333 Trenching and Backfilling Clarification

Hi John St. Hilaire,

The intent of the trenching and backfilling specification is to have suitable native material (described in the specification) around the pipe as shown in the trench details on ANGP-T-G-015. If the material 6" below the bottom of the trench is deemed to be suitable material (per specifications) by the CM team, then the pipe can be laid in the bottom of the trench as long as it is sufficiently supported as stated in 3.3.C:

"The bottom of the trench shall be accurately graded to provide a uniform layer of padding/bedding material, as required, for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections."

If the material in the trench is determined not suitable by the CM team, then borrow material as described in section 2.1.A.2 shall be used as select backfill and placed around the pipe according to the dimensions shown in the trench detail on sheet ANGP-T-G-015. Alternatively, the contractor may use a shaker bucket with the native material to screen out the oversized material to meet the specification. However, Part 2.1.A.1 states:

"A shaker bucket or screen may be used if native material is too large, given that the characteristics of the material are suitable for successful shaker bucket or screen use."

This clause was placed in there to clarify that if the material cannot work in a shaker bucket (e.g. clay) and that material is in large "clumps" and the CM team cannot assure that the material meets the specification, then borrow material must be brought in to bed the pipe.

As far as the Cathodic Protection issue goes, clay is not as dielectric (dielectric meaning a poor electrical conductor) as sand. However, there is nothing in the code that says you can't use clay around the pipe. Ark Engineering can speak better to this, but they studied the soils along the route in preparation for the design of the CP system.

Thanks,

Brendan

Brendan C. Kearns, P.E.*
Engineer II

CHA ~ *design/construction solutions*
Office: (802) 735-0374
Mobile: (978) 503-2333
bkearns@chacompanies.com
www.chacompanies.com
*VT

Responsibly Improving the World We Live In

ANGP Pipeline Anomaly Dig, @ station 565+85

Personnel On-Site: Darrel Crandall (Mott MacDonald), Steve Miner (VGS), Kate Marcotte (VGS), and the Michels Pipeline Construction crew

Date: 09/27/2016

The Enduro Pipeline Services caliper inspection detected a 1.7% deformation in the pipe at the 4:00/4:30 location on the pipe at station 565+85, indicating a possible dent in the pipe. Pictures below show no rocks were detected around the pipe or anywhere in the excavation. Pictures also show no indication of a dent found due to construction while inspecting the pipe.

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Excavation dirt pile with clumps of clay and no rocks.

Exposed pipe section at station 565+85. Moved stake into area to show location of possible dent.

ANGP Pipeline Anomaly Dig, @ station 565+85

No dent or coating damage spotted at station 565+85 after cleaning the pipe and thoroughly inspecting the pipe by hand. Checked the pipe several feet upstream and downstream of station number.

Excavation dirt pile with clumps of clay and no rocks. Expanded excavation to locate weld 0193.

ANGP Pipeline Anomaly Dig, @ station 565+85

Exposing more pipe to weld 0193. No rocks detected just clumps of clay and clay topsoil mix.

Measurement of 17’ from weld 0193 to possible dent to confirm location.

ANGP Pipeline Anomaly Dig, @ station 565+85

Confirmation measurement came to the same location from the first location observed based point set by survey. No dent detected due to a construction condition on any part of the pipe upstream or downstream of station 565+85. Re-inspected the pipe by hand several feet upstream and down stream of station 565+85 to feel for any damage. Also inspected pipe for damage in the entire section exposed. No coating damage detected or indication of a dent due to construction in the section of pipe exposed.

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Close up picture of station 565+85 at the 4:00/4:30 location. No coating damage or dent detected

PROJECT:
Addison Natural Gas Pipeline
Phase I

REQUEST FOR INFORMATION TRANSMITTAL

Date: 7/1/2016 RFI #: ANGP-VGS-RFI-025

RFI Title: Trenching, Pipe Laying, And Backfilling Specification Clarification

RFI Origin: Name: Christopher LeForce Contractor: Vermont Gas Systems, Inc.

RFI Submitted To: Name: Brendan Kearns Contractor: CHA

Discipline:
Engineering [X]
Environmental [ ]
Construction [ ]
Other (specify) [ ]

Information Requested:

VGS is requesting clarification with respect to the methods the pipeline can be placed in the trench and backfilled under *Section 312333 Trenching, Pipe Laying, And Backfilling Specification*. Please provide intent and clarification on the various methods the trench bottom can be prepared under the specification.

Information Response:

PER SPECIFICATION 31233, THE TRENCH BOTTOM MAY BE PREPARED UTILIZING TWO METHODS NOTED BELOW. WITH EITHER METHOD, THE PIPE SHALL HAVE A MINIMUM OF SIX (6) INCHES OF SELECT BACKFILL/PADDING PLACED BENEATH (BETWEEN IN-SITU NATIVE MATERIAL AND BOTTOM OF PIPE) AND ALL ON SIDES OF THE PIPE (SECTION 3.3.B).
1) THE PIPE MAY BE PLACED ON STACKED SANDBAGS, OR OTHER APPROVED SUPPORT METHOD (SECTION 3.5.B.) AND BACKFILLED AS SPECIFIED IN SECTION 312333.
2) THE PIPE MAY BE "CONTINUOUSLY SUPPORTED" WITH SELECT BACKFILL/PIPE PADDING (MINIMUM 6 INCHES) AS DESCRIBED IN SECTION 312333, PART 3.3.B, AND SHOWN ON DETAILS 3 AND 6 ON SHEET ANGP-T-G-015. THE CONTRACTOR AND CONSTRUCTION MANAGEMENT TEAM SHALL VERIFY THAT THE 6" OF PADDING MATERIAL BELOW THE PIPE MEETS SPECIFICATION 312333 PART 2.1.A.
PER THE SPECIFICATIONS AND DETAILS 3 AND 6 ON SHEET ANGP-T-G-015, LAYING THE PIPE DIRECTLY ON *IN-SITU* NATIVE MATERIAL ON BOTTOM OF TRENCH IS NOT ACCEPTABLE.

Authorized Signature: BCK

Printed Name and Title: BRENDAN KEARNS, CHA ENGINEER

Date: 7/5/16

Copies to: VGS-Office VGS - Field CHA VHB

From:	Chris LeForce
Sent:	Thursday, July 07, 2016 6:16 PM
To:	Morris, GC
Cc:	John St.Hilaire; Adam Gero; Porter, Louise
Subject:	VGS weekly meeting follow-up
Attachments:	Adhesion Test - Field Coating Rev.2.pdf; ANGP-VGS-RFI-025-R0 RESP.pdf; Denso 35 Tape Peel test procedure 2016 0707 Rev 1.pdf; VGS Project Org Chart_06142016 v1.pdf

GC,

I have attached multiple documents that you have requested copies of or have asked for additional clarification during our weekly meetings. They are listed below with an explanation.

VGS Project Org Chart_06142016 v1.pdf – This was provided in hard copy form at our meeting on 7/5/2016. John St. Hilaire said we would send along an electronic version.

Denso 35 Tape Peel test procedure 2016 0707 Rev 1.pdf & Adhesion Test - Field Coating Rev.2.pdf – It was requested that we properly title the adhesion test procedure for the Denso 35 Tape. The final version is attached. I have also included the updated QA/QC Adhesion Test Plan, which incorporates this test for the tape. These documents will be added to the Inspector Manual on Monday morning.

ANGP-VGS-RFI-025-R0 RESP.pdf – This is the Request for Information (RFI) related to the pipe trench preparation under Section 312333 Trenching, Pipe Laying, and Backfilling Specification. VGS had asked CHA to clarify the methods that were acceptable under the specification, as it is written under its current revision.

It was our intent to allow the pipe to be installed on the trench bottom if the soil conditions were shown to be rock free, which would be completed by inspecting the trench bottom and sidewalls and also the spoil from the trench. If a determination could not be made or the soil contained rocks, then the pipe would be properly supported and padded during the installation. This is a commonly accepted construction technique used in the industry by other companies when favorable soil conditions exist. This is a similar situation to the use of the sand berms or “dutchmen” for pipe support in the trench in lieu of sandbags or pipe pillows. It is a commonly used method of installation in the industry. Both are difficult to inspect and by a pure interpretation reading of the specification, neither is allowed unless the specification was edited and updated, as shown in CHA’s response to the RFI.

VGS at this time will not be using either technique and has instructed the Construction Management (CM) Team to completely pad the trench bottom or use sand bags as pipe supports unless they submit an alternative for approval. We will also circulate a copy of the RFI to the CM Team to present the interpretation. The CM Team has stated these have been the primary techniques used on the installed pipe, except for a few hundred-foot section installed south of the Williston Gate Station. We will incorporate this section into the QA/QC Program.

Regards, Chris

Adam Gero

From: John St.Hilaire
Sent: Thursday, June 08, 2017 3:57 PM
To: Chris LeForce; Adam Gero
Subject: FW: VGS weekly meeting follow-up

From: John St.Hilaire
Sent: Friday, July 01, 2016 4:55 PM
To: Morris, GC (GC.Morris@vermont.gov)
Cc: Chris LeForce; Adam Gero; Porter, Louise (Louise.Porter@vermont.gov)
Subject: VGS weekly meeting follow-up

Hi GC.

We had two items to follow up with from our Tuesday meeting including pipe placement in the trench and induced voltage.

Pipe placement in the trench – On 6/21 we discussed this item and we understood the issue to be around the placement of the pipe at the bottom of a trench and if our spec allowed for this or were we required to add padding. We engaged our engineering firm of record to provide input on whether the spec allowed for a pipe to be placed at the bottom of the trench when suitable backfill material is present. We provided an e-mail from the engineering firm describing his wording and intent to allow pipe to be placed on the bottom of the trench when suitable material is present without bedding. This is the same interpretation our inspection and our pipeline contractors have taken in regard to the spec. During our 6/28 meeting, we learned the issue was not the mechanical aspects of placing the pipe at the bottom of a trench, it is the corrosion potential due to oxygen differentials in the soil layers. We again reached out to others to determine if this was an acceptable practice. We engaged Mott McDonald and two New England LDC's who all reported that when suitable backfill material is present in the bottom of the trench, it is acceptable and common to put the pipe on the bottom of the trench. Today (7/1) at 2pm, we discussed this with ARK engineering to understand the corrosion aspect of oxygen concentration. We reviewed the report (Bushman & Associates, Inc.) provided by Mr. McCauley and find it does walk through various corrosion mechanisms including Galvonic Corrosion, Oxygen concentration corrosion, and Corrosion caused by dissimilar soils. Further it states "corrosion can be caused due to differences in the electrolyte. These differences may be in the soil resistivity, oxygen concentration, moisture content, and various ion concentrations". The next section of the report details corrosion control mechanisms including coating pipe and cathotic protection.

Corrosion is a factor that we work to minimize on a pipeline. Corrosion can occur from oxygen concentrations at the change of soil from one geologic area to another, from an HDD to open trenching, and from moving through wetlands not only due to soil changes but due to the added moisture content of the soil. We cannot eliminate every risk of corrosion, which is why we utilize the corrosion control mechanisms listed in the Bushman report including pipe coating, cathotic protection, and compacting backfill with native soil in minimizing oxygen concentration corrosion.

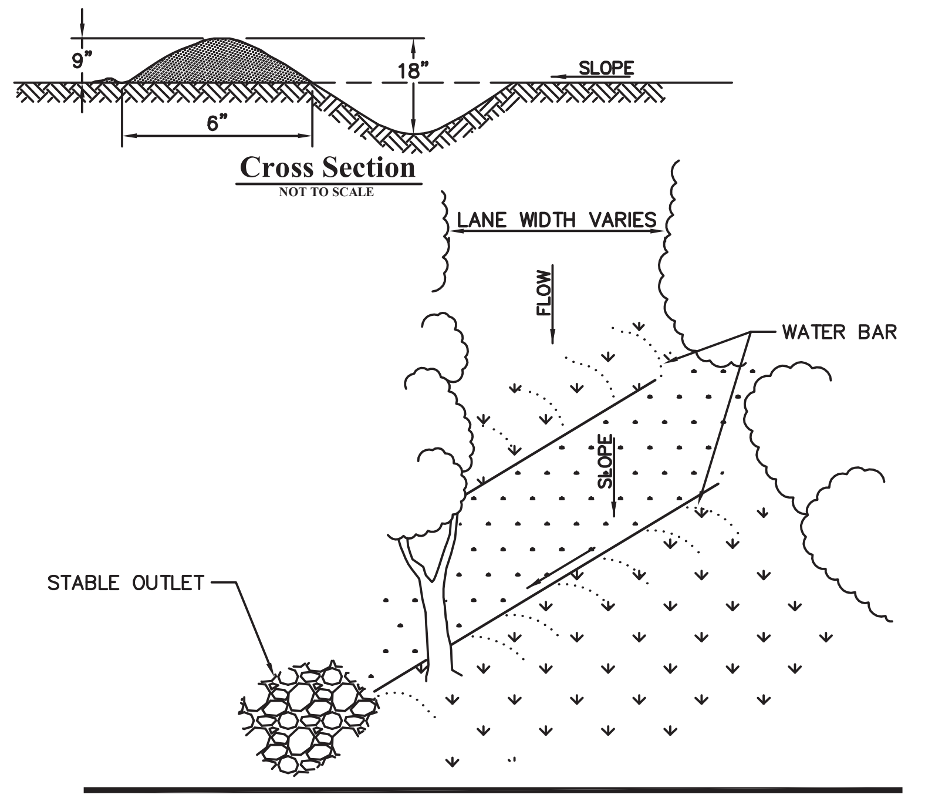
Our research shows that placement of cathotically protected coated steel pipe on the bottom of a trench with suitable backfill material (no sharps, etc) is an accepted practice in the natural gas industry from a mechanical and corrosion perspective. The Bushman concludes with "When a system is designed, installed, and maintained properly, cathotic protection is one of the most effective and economical methods of preventing corrosion". With the evaluation complete, we have submitted an RFI to our engineer to officially clarify the spec and its allowance for the placement of the pipe at the bottom of a trench when suitable backfill material is present.

Induced voltage – On 6/21 we again discussed managing induced voltage. We both had been trying to get a Velco procedure to manage induced voltage. In the meantime, Michels implemented their standard management approach to induced voltage including daily measuring and installing grounding rods. We were also asked about the qualifications of the Michels safety individual who was managing the induced voltage program. During the week of 6/21 we developed a formal Michels procedure, provided a summary of the readings for the project, and the resume of the Michels regional safety manager. All readings from the start of the project were substantially below the recommended level of 15 volts. On 6/28, we provided the written procedure and asked for comments. We also agreed to provide additional information regarding the Michels safety person for Induced voltage. We reached out to Ark Engineering, two New England LDC's, and our own NACE 2 CP tech to learn about managing induced voltage on a shared ROW. We learned a procedure should be in place, testing and training should be required, and grounding installed to manage induced voltage. We learned that there is no industry certification for induced voltage and the NACE CP certifications only briefly covers induced voltage. Our research indicated that an individual with actual experience managing induced voltage on a pipeline project should be used to manage the induced voltage program. During our conversation with ARK engineering, we asked them to audit our procedure and give feedback on how we can improve the procedure. We provided the procedure to ARK on 7/1. Ark Engineering is the entity that designed the cathotic protection system for the pipeline and did an induced voltage survey of the Velco line when designing the system. We continue to be open to suggestions and ways to improve the management of induced voltage.

I am still working on the information on the Michels regional safety manager and hope to have that for you on Tuesday.

Please let me know if you have any questions.
John

Attachment 7



Construction Specifications

1. INSTALL THE WATER BAR AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
2. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
3. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
4. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.
5. FOR PERMANENT WATER BARS, VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE SEEDED AND MULCHED. FOR TEMPORARY WATER BARS, VEHICLE CROSSING SHALL BE COMPACTED AND MAINTAINED PER THESE SPECIFICATIONS. FOLLOWING THEIR USE, WATER BARS SHALL BE REGRADED TO MATCH PRE-CONSTRUCITON CONDITIONS. TOPSOIL SHALL BE RE-APPLIED THEN ALL AREAS OF EXPOSED SOIL SHALL BE FULLY STABILIZED PER THE EPSC PLAN.
6. INSPECT WATER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.
7. SPACING:

SLOPE (%)	SPACING (FT)
<5	125
5–10	100
10–20	75
20–35	50
>35	25

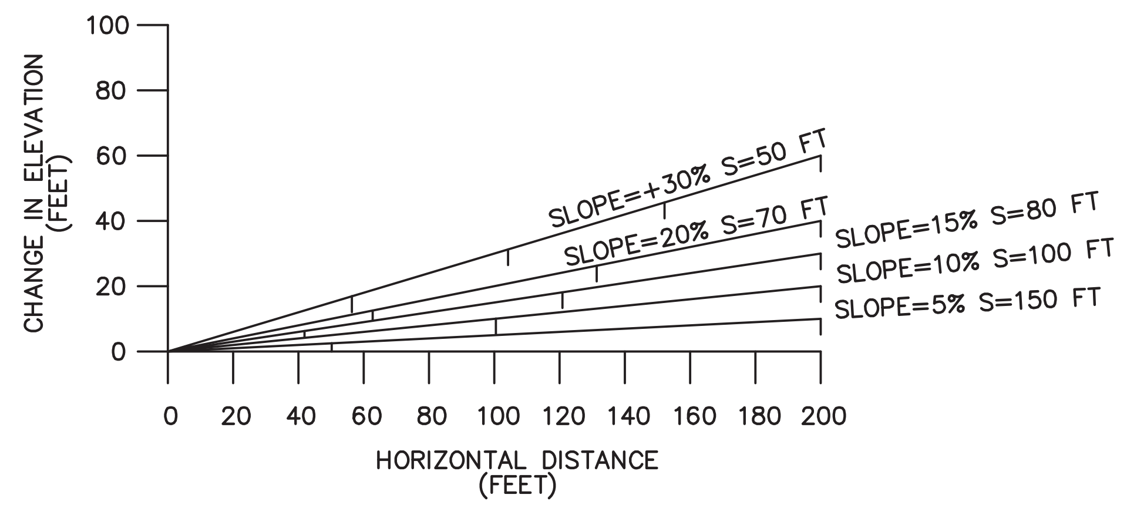
1 Water Bars

10/13

N.T.S.

Source: Vermont Standards and Specs for EPSC 2006

LD_



NOTE: S = TRENCH BREAKER SPACING

NOTES:

1. PERMANENT TRENCH BREAKER SANDBAGS SHALL NOT BE FILLED WITH TOPSOIL.
2. SPACINGS SHOWN ARE RECOMMENDED MINIMUM GUIDELINES. OSPC REPRESENTATIVE MAY ADJUST SPACING IN THE FIELD WITH PRIOR WRITTEN APPROVAL OF OWNER.
3. ONE TRENCH BREAKER IS REQUIRED AT ALL STREAM BANKS AND AT WETLAND BOUNDARIES.
4. REFER TO SHEETS ANGP-T-G-020B AND 020C FOR APPROXIMATE TRENCH BREAKER LOCATIONS.

3

2 Permanent Trench Break Spacing Guideline

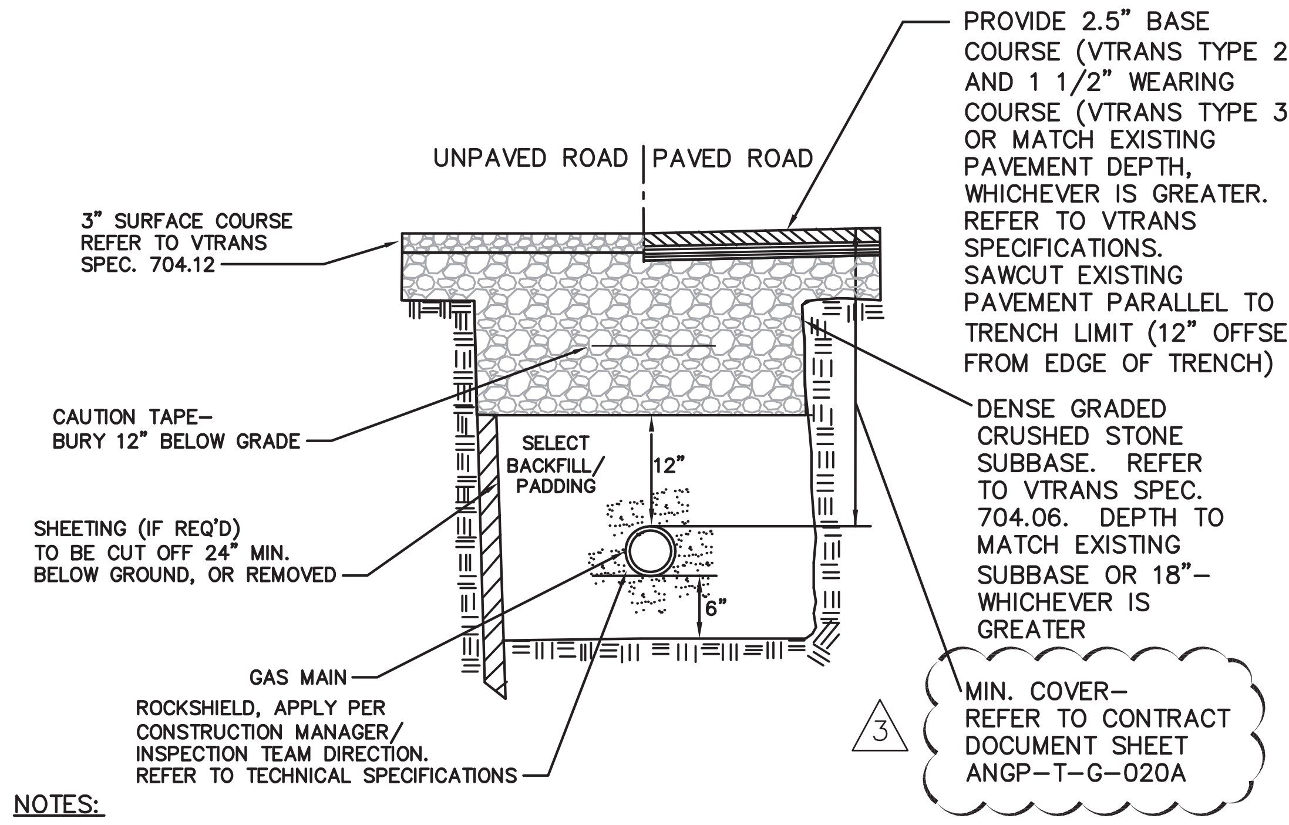
12/12

N.T.S.

Source: CHA

LD_

2



NOTES:

1. REFER TO TECHNICAL SPECIFICATIONS FOR BOTH GENERAL AND SELECT/PADDING BACKFILL REQUIREMENTS.
2. IN RESOURCE AREAS (E.G. WETLANDS AND PAS AREAS) GENERAL BACKFILL SHALL BE NATIVE MATERIAL TO MATCH PROFILE DEPTH OF ADJACENT NATIVE, UNDISTURBED SUBSOIL/SURFACE SOIL INTERFACE. EXCESS SUBSOIL TO BE PROPERLY DISPOSED OF AND STABILIZED.
3. THE OWNER SHALL PROVIDE TESTING SERVICES TO INSURE THAT THE IN-PLACE DENSITY OF THE BACKFILL MEETS REQUIREMENTS DETERMINED IN THE SPECIFICATIONS.
4. ALL TRENCH CONSTRUCTION SHALL CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
5. FOR PIPE SUPPORT METHODS AND OTHER PIPE-IN-TRENCH REQUIREMENTS, REFER TO TECHNICAL SPECIFICATIONS.

3 Typical Trench Detail-Roadways and Driveways

11/14

N.T.S.

Source: CHA

LD_

2

CHA PLAN SHEET #	TOWN	PROJECT COMPONENT	PLANT ID CODE	STATE RANK	MATTING LOCATIONS (STATION)
ANGP-EPSC-014	WILLISTON	TRANSMISSION (ACCESS ROAD)	2012-RTE-CT-03 1	S2/S3	366+50 TO 368+75 AND ON ACCESS ROAD
ANGP-EPSC-022	WILLISTON	TRANSMISSION	2012-RTE-CT-08 4	S2/S3	562+50 TO 563+75
ANGP-EPSC-039	HINESBURG	TRANSMISSION	2012-RTE-CT-08 0	S2/S3	992+80 TO 993+50
ANGP-EPSC-039	HINESBURG	TRANSMISSION	2012-RTE-CT-08 1	S2/S3	1001+20 TO 1002+20
ANGP-EPSC-039	HINESBURG	TRANSMISSION	2012-RTE-CT-08 2	S2/S3	1003+50 TO 1005+80
ANGP-EPSC-040	HINESBURG	TRANSMISSION	2012-RTE-CT-04 1	S2/S3	1021+20 TO 1023+00
ANGP-EPSC-051	MONKTON	TRANSMISSION	2012-RTE-ACT-0 83	S2/S3	1302+10 TO 1307+90
ANGP-EPSC-066	NEW HAVEN	TRANSMISSION	2012-RTE-CT-05 1	S2/S3	1649+50 TO 1652+00
ANGP-EPSC-066	NEW HAVEN	TRANSMISSION	2012-RTE-CT-06 1	S2/S3	1665+50
ANGP-EPSC-066	NEW HAVEN	TRANSMISSION	2012-RTE-AT-05 3	S1	1659+60
ANGP-EPSC-066	NEW HAVEN	TRANSMISSION	2012-RTE-LV-05 4	S2	1659+60
ANGP-EPSC-066	NEW HAVEN	TRANSMISSION	2012-RTE-AT-06 3	S1	1669+70 TO 1670+50
ANGP-EPSC-075, 079, 077	NEW HAVEN	TRANSMISSION	2012-RTE-CT-06 9	S2/S3	1918+00 TO 1966+50
ANGP-EPSC-V011	FERRISBURGH	DISTRIBUTION MAIN	2012-RTE-CT-06 8	S2/S3	118+80 TO 119+10

Notes:

1. INSTALL CONSTRUCTION MATS ON STATION LOCATIONS LISTED IN TABLE TO PROTECT RARE PLANT SPECIES.
2. LIMIT DURATION OF MATTING DURING GROWING SEASON TO EXTENT PRACTICABLE.
3. REMOVE MATTING IMMEDIATELY FOLLOWING THEIR USE. FOR EXAMPLE, WHERE MATTING IS USED FOR TEMPORARY STOCKPILING OF SOIL FROM TRENCHING OPERATIONS, REMOVE MATTING IMMEDIATELY FOLLOWING BACKFILL OPERATIONS.
4. AT A MINIMUM, MATTING IS NOT TO BE LEFT IN PLACE FOR MORE THAN 28 DAYS WHERE FEASIBLE.
5. REFER TO ADDITIONAL ENVIRONMENTAL NOTE 12 ON SHEET ANGP-T-G-011

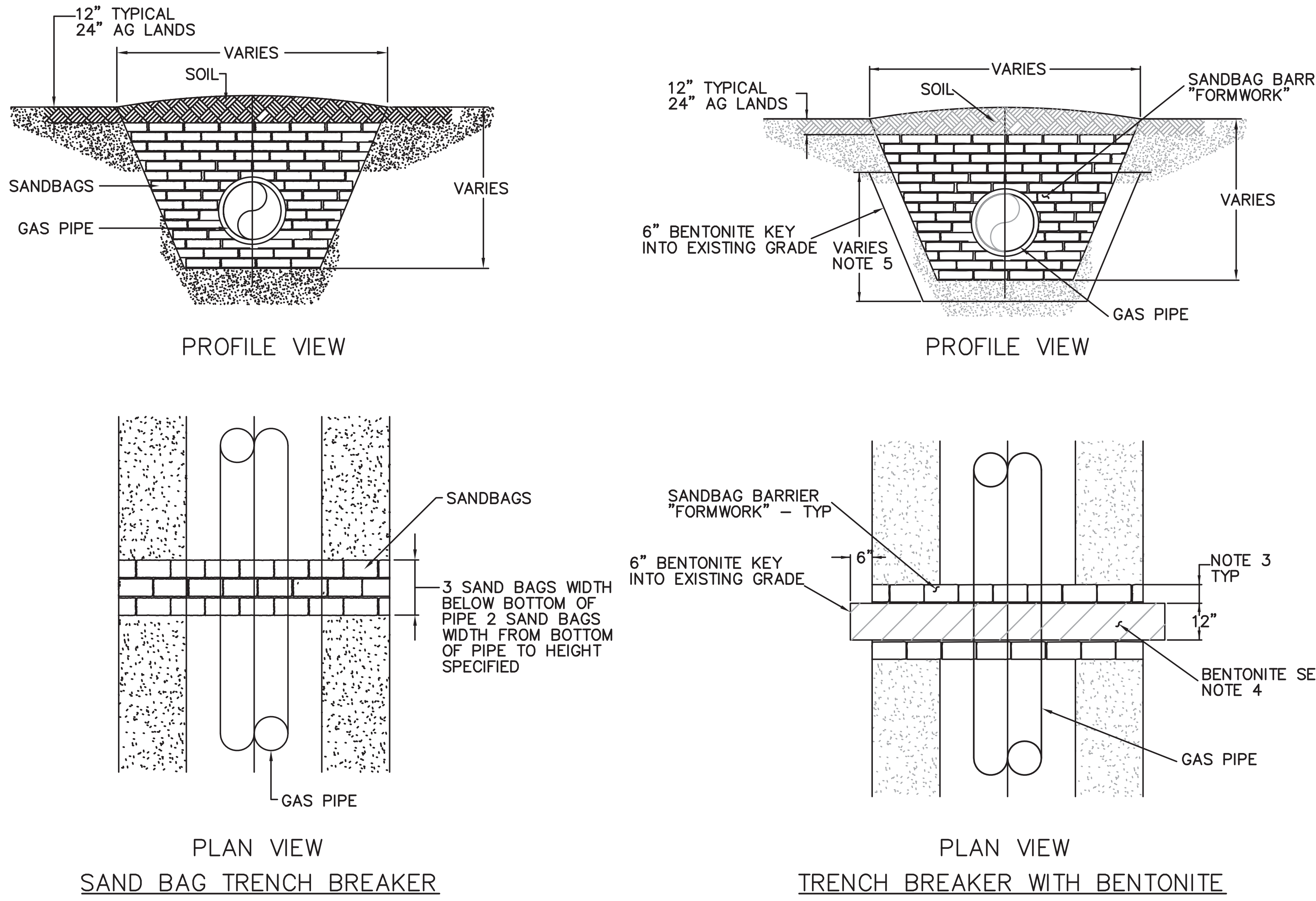
4 RTE Matting Table

09/13

N.T.S.

Source: VHB

3



SAND BAG TRENCH BREAKER

TRENCH BREAKER WITH BENTONITE

NOTES:

1. PERMANENT TRENCH BREAKER WITH BENTONITE SEAL IS INTENDED TO PROHIBIT WATER FLOW THROUGH THE BREAKER.
2. PERMANENT TRENCH BREAKER WITH BENTONITE SEAL TO BE INSTALLED AT EDGE OF WETLANDS AND STREAMS.
3. SAND BAG BARRIER WIDTH SHALL BE MINIMUM 1 BAG WIDE AND/OR AS FIELD DETERMINED TO PROVIDE STABILITY.
4. BENTONITE IS TO BE INSTALLED IN THE VOID SPACE BETWEEN THE SANDBAG BARRIER "FORMWORK" IN SUCH A MANNER TO COMPLETELY SURROUND THE PIPE AND FILL THE VOID FROM THE BOTTOM OF THE TRENCH TO A HEIGHT 6" ABOVE THE LEVEL OF IMPORTED PADDING MATERIAL WHICH IS INSTALLED ON THE EXTERIOR SIDE OF THE SANDBAG BARRIER IN THE WETLAND ZONE.
5. AFTER BENTONITE PLACEMENT, INSTALL SAND BAGS ON TOP OF THE PERMANENT TRENCH BREAKER AND BENTONITE SEAL TO THE REQUIRED HEIGHT PER DETAIL 2 AND BACKFILL EXTERIOR SIDES OF SAND BAG BARRIERS.

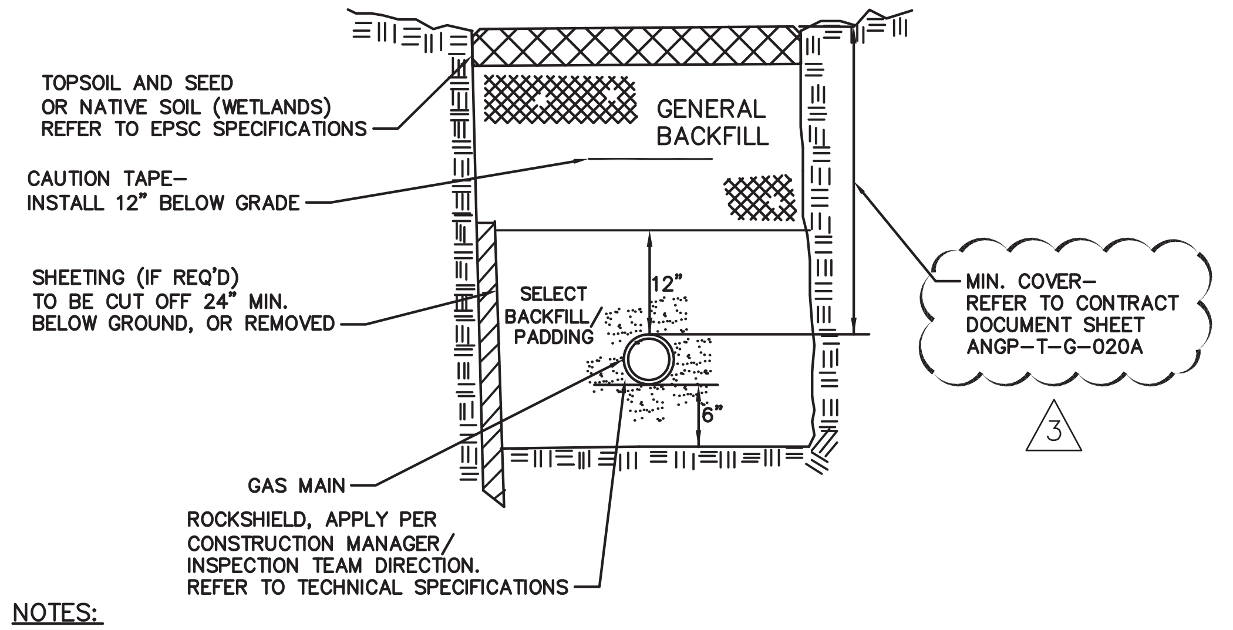
5 Permanent Trench Break or Sandbags

12/12

N.T.S.

Source: CHA

LD_



NOTES:

1. REFER TO TECHNICAL SPECIFICATIONS FOR BOTH GENERAL AND SELECT/PADDING BACKFILL REQUIREMENTS.
2. IN RESOURCE AREAS (E.G. WETLANDS AND PAS AREAS) GENERAL BACKFILL SHALL BE NATIVE MATERIAL TO MATCH PROFILE DEPTH OF ADJACENT NATIVE, UNDISTURBED SUBSOIL/SURFACE SOIL INTERFACE. EXCESS SUBSOIL TO BE PROPERLY DISPOSED OF AND STABILIZED.
3. THE OWNER SHALL PROVIDE TESTING SERVICES TO INSURE THAT THE IN-PLACE DENSITY OF THE BACKFILL MEETS REQUIREMENTS DETERMINED IN THE SPECIFICATIONS.
4. ALL TRENCH CONSTRUCTION SHALL CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
5. FOR PIPE SUPPORT METHODS AND OTHER PIPE-IN-TRENCH REQUIREMENTS, REFER TO TECHNICAL SPECIFICATIONS.

6 Typical Trench Detail-Cross Country

11/14

N.T.S.

Source: CHA

LD_

3

DWG. NO.	REFERENCE DWG.	REV	DSN	CK	DESCRIPTION
		3	GJM	BCK	IFC 2016 EDITS (05/2016)
		2	BCK	TDB	TRENCH DETAIL UPDATE (1/6/16)
		1	BCK	TDB	DEPTH OF COVER UPDATE (6/11/15)

	BID		CONSTRUCTION	
	INITIALS	DATE	INITIALS	DATE
ENVIRONMENTAL	JLS	06/28/13	JLS	05/2016
DRAFTING DESIGNER	GIL	06/28/13	GJM	05/2016
DRAFTING SUPERVISOR	BZD	06/28/13	BCK	05/2016
DESIGN ENGINEER	MDF	06/28/13	GEW	05/2016
DESIGN MANAGER	SAB	06/28/13	JEO	05/2016

VERMONT GAS
PROPOSED 12" PIPELINE
ADDISON NATURAL GAS PROJECT
CONSTRUCTION DETAILS

LOC. CHITTENDEN & ADDISON COUNTIES

YEAR: 2016
W.O.
SCALE: NOTED
DWG. ANGP-T-G-015
REV. 3

Vermont Gas

Vanasse Hangen Brustlin, Inc.

CHA
38 Eastwood Drive, Suite 105
South Burlington, VT 05403
Main: (802) 735-0372 · www.chacompanies.com

Attachment 8

Vermont Gas

Lower-In/Padding/Backfill Daily Report

PROJECT NAME: **Addison Natural Gas Project Phase 1**
DATE: 9/6/16
PROJECT JOB #: **28757**
CONTRACTOR: **Michels**
PROJECT LOCATION: Otter Creek
WEATHER CONDITIONS: Sunny 84

LOWERED-IN:	FROM STA.	TO STA.	DAILY TOTAL
YES	1633+00	1655+55	255FT

PADDING:	EACH	FROM STA.	TO STA.	DAILY TOTAL
SANDBAG SUPPORT	5	1633+00	1655+55	45
BENTONITE				
PADDING BERM				

BACKFILL:	FROM STA.	TO STA.	DAILY TOTAL

SAFETY:			REMARKS:
ONE CALLS MADE	YES ☑	NO ☐	
SAFETY MTG CONDUCTED	YES ☑	NO ☐	
TRAFFIC CONTROL BARRIERS & SIGN	YES ☑	NO ☐	
PPE USE COMPLIANCE	YES ☑	NO ☐	
WORK SITE HOUSEKEEPING	YES ☑	NO ☐	
JOB SITE SECURED	YES ☑	NO ☐	

ENVIRONMENTAL CONCERNS:

COMMENTS:

INSPECTOR NAME: Clint Music
INSPECTOR SIGNATURE: Clint Music
CHIEF INSPECTOR REVIEW:

Attachment 8

Attachment 9

Corrosion
and
Cathodic Protection Theory

by
James B. Bushman, P.E.
Principal Corrosion Engineer
Bushman & Associates, Inc
Medina, Ohio USA

BUSHMAN & Associates, Inc.
CORROSION CONSULTANTS

P. O. Box 425 Medina, Ohio 44256
Phone: (330) 769-3694 Fax: (330) 769-2197

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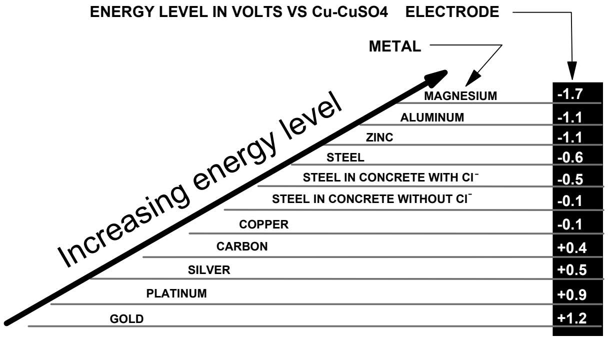
Corrosion and Cathodic Protection Theory

By James B. Bushman, P.E.
Bushman & Associates, Inc. – P.O. Box 425 – Medina, Ohio 44256 USA
Phone: (330) 769-3694 – Fax: (330) 769-2197

I. Introduction

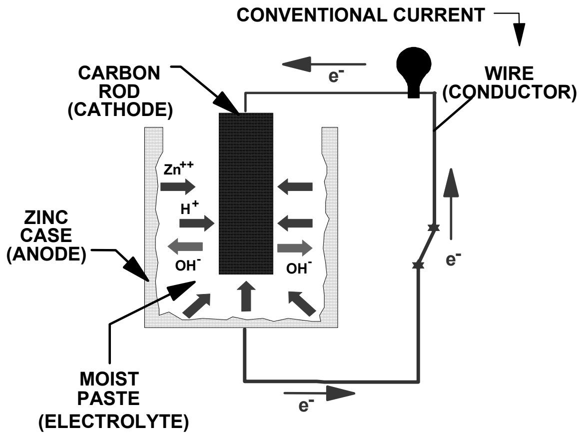
Nature has endowed each metallic substance with a certain natural energy level or potential.

GALVANIC ENERGY SERIES



When two metals having different energy levels or potentials are coupled together, current will flow. The direction of positive current flow will be from the metal with the more negative potential through the soil to that which is more positive. Corrosion will occur at the point where positive current leaves the metal surface. A dry cell battery is one example of a corrosion cell.

COMMON DRY CELL BATTERY



DC railways and other machinery often generate direct current. When this current flows through the soil indiscriminately, it is referred to as "stray" DC. The current may contact and follow a buried metallic structure such as a pipeline, but wherever it leaves that structure to return to it's origin, corrosion will occur.

Cathodic protection is an electrical method of preventing corrosion on metallic structures which are in electrolytes such as soil or water. It has had widespread application on underground pipelines, and ever increasing use as the most effective corrosion control method for numerous other underground and underwater structures such as lead cables, water storage tanks, lock gates and dams, steel pilings, underground storage tanks, well casings, ship hulls and interiors, water treatment equipment, trash racks and screens. It is a scientific method which combats corrosion by use of the same laws which cause the corrosion process.

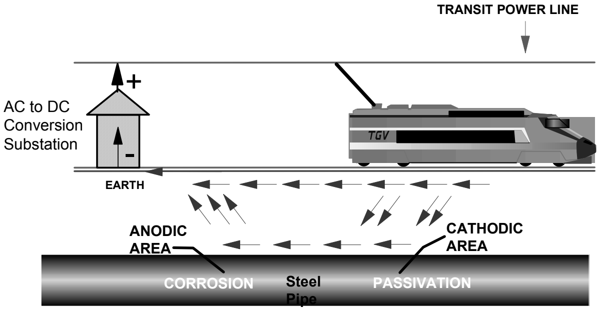
II. Corrosion Mechanism

There are two basic mechanisms by which metals in electrolytes corrode

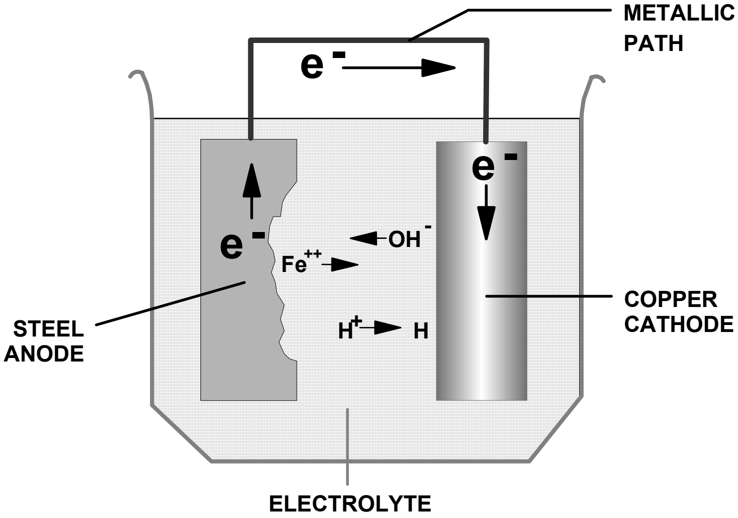
- Electrolytic Corrosion
- Galvanic Corrosion

Electrolytic corrosion is a result of direct current from outside sources entering and then leaving a particular metallic structure by way of the electrolyte. Where current nters the structure, that part is usually unaffected or is provided with some degree of protection. Where current leaves the structure, corrosion occurs. In underground work, this type of corrosion is often referred to as stray current corrosion and results from currents entering the soil from sources of DC such as electric railway systems or DC machinery.

STRAY DIRECT CURRENT CORROSION



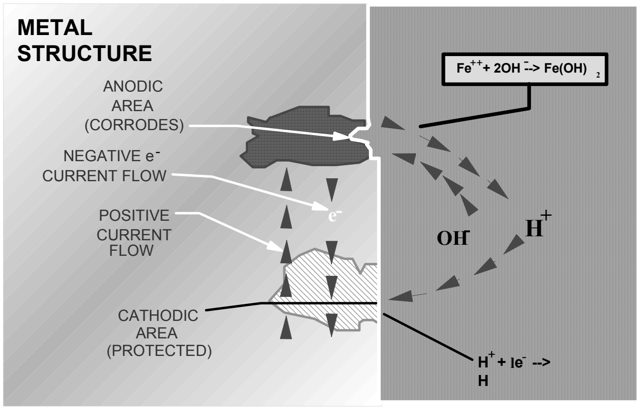
Galvanic corrosion is self-generated activity resulting from differences in energy levels or potentials which develop when metal is placed in an electrolyte. These differences can arise from the coupling of dissimilar metals, variations in the electrolyte, non-homogeneity of the metal, or a combination of the above.



BI-METALLIC CORROSION

Current will be generated when two dissimilar metals are electrically connected and immersed in an electrolyte. One of the metals will corrode. The path of the current will be from the corroding metal, through the electrolyte (soil) to the non-corroding metal and then back through the connection (conductor) between the two metals. The corroding metal is the one where the current leaves to enter the electrolyte and is called an anode. The metal that receives the current is called the cathode.

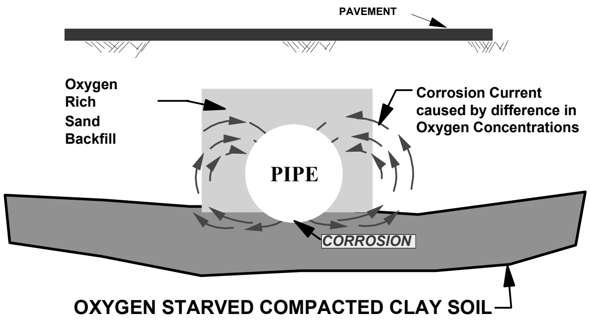
The same metallic structure, when placed in an electrolyte (e.g. soil) can develop differences in potential as a result of metal grain composition, milling imperfections, scratches, threads, etc., being exposed. Those portions will usually be, anodic to the remainder of the surface and will corrode.



GALVANIC CORROSION OF A SINGE METAL.

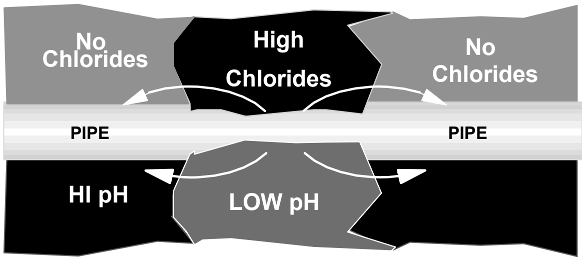
Corrosion can occur due to differences in the electrolyte. These differences may be in the soil resistivity, oxygen concentrations, moisture content and various ion concentrations. The variations produce current flow from one location, through the electrolyte, to another portion of the same metallic structure.

OXYGEN CONCENTRATION CORROSION



Electrolytic corrosion and galvanic corrosion are similar in that corrosion always occurs at the anodic areas. The essential difference between the two is that in the case of electrolytic corrosion, the external man-made current generates the corrosion; in galvanic corrosion, the natural process of corrosion generates the current. There is also a difference in polarity. In an electrolytic cell, the anode is the positive electrode; in a galvanic cell, the anode is the negative electrode.

CORROSION CAUSED BY DISSIMILAR SOILS



It has been established that electric current can generate corrosion, corrosion, in turn can generate electric current. As indicated by these phenomena, it is then possible to prevent corrosion by use of electrical current. This, then, is the basis for cathodic protection. When direct current is applied with a polarity which opposes the natural corrosion mechanisms, and with sufficient magnitude to polarize all the cathodic areas up to the open circuit potential of the anodic areas, corrosion is arrested.

The theoretical considerations indicate that the basis for cathodic protection is relatively simple not difficult to understand. However, practical designs for various applications can vary considerably based on the type of structure to be protected and the conditions encountered.

III. Corrosion Control Mechanism

Cathodic protection is an electrical method of preventing corrosion on metallic structures situated in electrolytes. In practical applications, the structures most commonly provided with protection are constructed of iron or steel (including stainless steel) and the electrolytes are most often soil and water. Other metals commonly provided with cathodic protection include, lead sheathed cables, copper and aluminum piping, galvanized steel, and cast iron. Cathodic protection has also been used successfully in unusual electrolytes such as concrete, calcium chloride and caustic soda. However, the vast majority of cathodic protection systems are used to prevent corrosion on steel structures in soil and water. Cathodic protection has become a standard procedure for many structures such as underground storage tanks, pipelines, water storage tanks, ship hulls and interiors, lock gates and dams, water treatment facilities, well casings, trash racks and screens, bridge decks, and steel pilings.

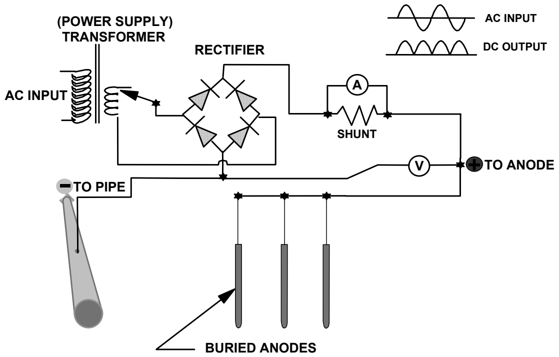
As far back as the Bronze Age, it was observed that metals were not very stable when subjected to their natural environments such as soil and sea water. About 1780, a physiologist, Luigi Galvani, reported on his experiments with metallic arcs of dissimilar metals. He was studying the muscular structure of the frog. He noticed that when the frogs were suspended on an iron rack by copper hooks, there was a twitching in their leg muscles. One of the foremost physicists of the period, Alessandro Volta, was able to demonstrate that the phenomenon was caused by electricity produced by the dissimilarity of the metals in contact with the biological specimens.

In 1824, Sir Humphry Davy, on contract to the royal Navy, discovered the principle of cathodic protection for the mitigation of natural corrosion processes. He was searching for a method to prevent corrosion of the copper-clad wooden hulls of English ships. He attached billets of zinc to the copper and observed that the zinc would corrode to save the copper. Today, over one and one-half centuries later, corrosion engineers are still using this same method of preventing corrosion damage by applying this same zinc anode cathodic protection to steel ships around the world.

IV. Methods of Application

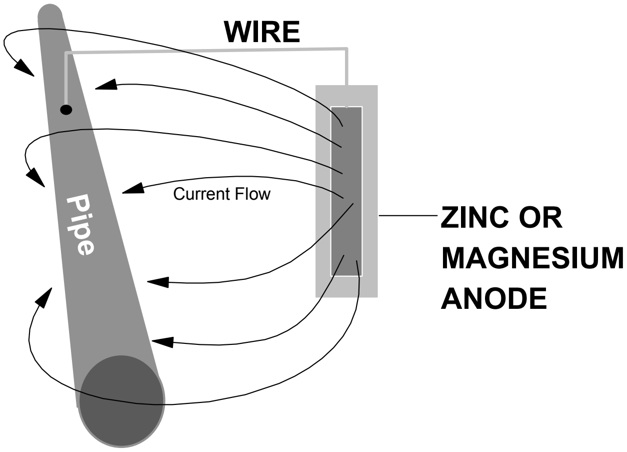
There are basically two methods of applying cathodic protection. One of these methods makes use of anodes which are energized by an external DC power source. In this type of cathodic protection system, anodes are installed in the electrolyte and are connected to the positive terminal of a DC power source and the structure which is to be protected is connected to the negative terminal of that source. Because the power source is almost always a rectifier unit, this type of system is often referred to as a rectifier or impressed current type system.

IMPRESSED CURRENT CATHODIC PROTECTION



The second method of protection makes use of galvanic anodes which have a higher energy level or potential with respect to the structure to be protected. These anodes are made of materials, such as magnesium or zinc, which are naturally anodic with respect to steel structures and are connected directly to these structures.

SACRIFICIAL ANODE CATHODIC PROTECTION



In most cases, the rectifier type system is designed to deliver relatively large currents from a limited number of anodes, and the galvanic anode type system is designed to deliver relatively small currents from a large number of anodes. Each method of applying cathodic protection has characteristics that make it more applicable to a particular problem than the other. A comparison of those characteristics is as follows:

COMPARISON OF CP SYSTEM CHARACTERISTICS

Galvanic	Rectifier
NO External Power required	External Power Required
Fixed driving voltage	Adjustable Voltage
Fixed Current	Adjustable Current
Limited Current (10 to 50 Milli-amperes Typical)	Unlimited Current (10 to 100 Amperes Typical)
Usually used in lower resistivity electrolytes	Can be Used in almost Any Resistivity Environment
Usually used with small or very well coated structures	Can be Used on Any Size Structure
Low $/Unit Cost	High $/Unit Cost
High $/Sq. Ft. of Metal Protected	Low $/Sq. Ft. of Metal Protected
Low Maintenance	Higher Maintenance
Does NOT cause Stray Current Corrosion	Stray DC Currents Can be Generated

Regardless of the type of system used, current flows from the cathodic protection anode through the soil to the structure to be protected. Where this current flows onto a structure from the surrounding electrolyte (soil), the potential of the structure is made more negative. Cathodic protection is achieved when this change in potential is sufficient to arrest corrosion.

It would appear that cathodic protection can be achieved merely by the application of current of sufficient magnitude. Although this statement is true, it is deceptively simple because there are very large differences in the design of cathodic protection systems. These differences result from the infinite variety of structures that are to be protected and from the large assortment of environments in which those structures are located. Because of the large differences in the designs of systems necessary to achieve protection, it is often necessary for existing structures that each system be custom designed for a given location.

In order to prevent corrosion using cathodic protection, current must flow from the electrolyte onto the structure at all locations. If a portion of the structure does not receive current, the normal corrosion activity will continue at that point. If any of the cathodic protection current picked up by the structure leaves that structure to flow back into the electrolyte, corrosion will be accelerated at the location where the current is discharged. As an example, when mechanically coupled piping is used, this can be discontinuous from one pipe section to the next. If a galvanic anode type system is used for protection, it may be necessary to install an anode on each pipe length or to electrically bond across each joint. If one length of pipe is neglected, that length will receive no cathodic protection and the normal corrosion activity will continue. When a rectifier type system is installed on an underground storage tank system, it is even more important that the tank and lines be electrically continuous. If there are non-continuous joints, it is possible for the cathodic protection current to leave the pipe or tank to flow around the electrically discontinuous joint causing corrosion at each point where the current leaves the pipe surface. Similarly, if cathodic protection current is applied to one structure in an area, it is possible for other structures in the neighborhood to be exposed to damage unless proper steps are taken. Potential measurements are used to determine whether such damaging exposure exists. Just as protection is indicated when the potential of a structure is made more negative, stray current corrosion is indicated when the potential of a structure is made less negative as a result of the application of cathodic protection current.

V. Anode Materials

Galvanic Anodes

Protective current generated by galvanic anodes depends upon the inherent potential difference between the anodes and the structure to be protected. Thus, if the structure is made of iron or steel, any metal that is more active in the electromotive force series can theoretically be used as anode material. In practice, the materials generally used for galvanic anodes are zinc and magnesium. Although aluminum is also a material which is more active than iron, it has not yet proved to be an effective galvanic anode material for underground use because of the polarization films which build up on the aluminum surface as it corrodes, thereby ceasing the generation of protective current. In recent years, some alloys of aluminum have been used successfully in seawater applications and work is progressing on alloys that may prove to be effective in other applications.

It should be noted that galvanic anodes consume themselves in the process of generating protective currents. The rate of consumption is dependent upon the magnitude of current generated as well as the material from which the anode is made. For example, the theoretical consumption rate of zinc is 23.5 lbs. per ampere year and that of magnesium is 8.7 lbs. per ampere year. In actual practice, not all of the metal is consumed in generating current that is useful for cathodic protection. Some of the metal is consumed in self-corrosion. Zinc is approximately 90% efficient and magnesium is approximately 50% efficient. Therefore, the actual pounds consumed per ampere year of protective current are 26 and 17 lbs. for zinc and magnesium respectively.

In underground applications, these anodes are normally surrounded with a special backfill. The backfill is usually a mixture of gypsum, Bentonite and sodium sulfate. This special backfill serves a number of purposes. First, it provides a uniform environment for the anode, thereby making the corrosion of the anode uniform; second, the backfill decreases the anode-to earth resistance; third, it retains moisture and thereby maintains a lower resistance; and fourth, it acts as a depolarizing agent.

Impressed Current Anodes

When a rectifier type system is used, the current is derived from an outside source and is not generated by the corrosion of a particular metal as is the case with galvanic anodes. However, materials used as energized anodes do corrode. Thus, junk pipe and steel rails that were at one time used extensively as anode materials in rectifier type systems, corrode at the rate of 20 lbs. per ampere year. Even a relatively small rectifier system, with a capacity of only 10 amperes, would consume 2000 lbs. of steel in 10 years. Therefore, longer life anode materials were sought. The materials that are used almost universally today are graphite, high silicon cast iron and precious metal oxide coated titanium. In underground work, special coke breeze backfills are usually used for the purpose of providing a uniform environment around the anode and for lowering the anode-to-earth resistance.

VI. Examples

Underground Coated Structures

The economics favoring cathodic protection of cross country pipelines are so overwhelming, particularly on high pressure gas and oil lines, that practically every new line of consequence is provided with cathodic protection almost immediately after completion. The Department of Transportation has passed Federal legislation requiring that all oil, gas and gas products pipelines be cathodically protected and that the level of protection meets designated standards and regulations.

New structures are generally provided with a good, high resistivity coating that is applied with techniques that leave almost negligible amounts of the surface exposed to the soil. However, it is recognized that a coating, no matter how good or how well applied, is never perfect.

The corrosion protection afforded by the coating must be supplemented with cathodic protection in order to achieve complete mitigation of corrosion. It is important to understand that coated structures develop leaks within a shorter period of time than do uncoated structures. This is true even though the total metal loss on a coated structure is appreciably less than on a bare structure. All of the corrosion activity is concentrated at the holidays or breaks in the coating rather than evenly dispersed over the entire surface, thus accelerating the corrosion rate at the holiday locations.

Fortunately for the structure owner, coating and cathodic protection work very well together. When a tank or pipe is coated with one of the high quality materials and closely controlled application techniques that are available today, a relatively small magnitude of current can provide complete cathodic protection for tanks and their associated piping.

Although protection of cross country pipelines and existing rural tank farms is usually provided with the rectifier type systems, the use of such systems in congested areas is often very difficult because of the many interference problems created on nearby structures. Therefore, in congested areas, sacrificial anode type systems are more often used.

One example was of a well coated 10,000 gallon underground storage tank located in Detroit, Michigan. It was amply protected with one anode installed on one end of the tank with a total current output of less than 10 milli-amperes of current. The fact that sacrificial anodes have been installed on over 200,000 well-coated underground storage tanks without a single corrosion related product discharge is a testament to the effectiveness of this approach.

In many instances, spacing of anodes can be extended to 100 - 500 feet or more on small diameter buried piping depending on the quality of the coating and environmental conditions. As a consequence, many companies in recent years have established programs in which magnesium anodes are installed on pre-selected spacings as the well-coated piping is laid.

Underground Bare Structures

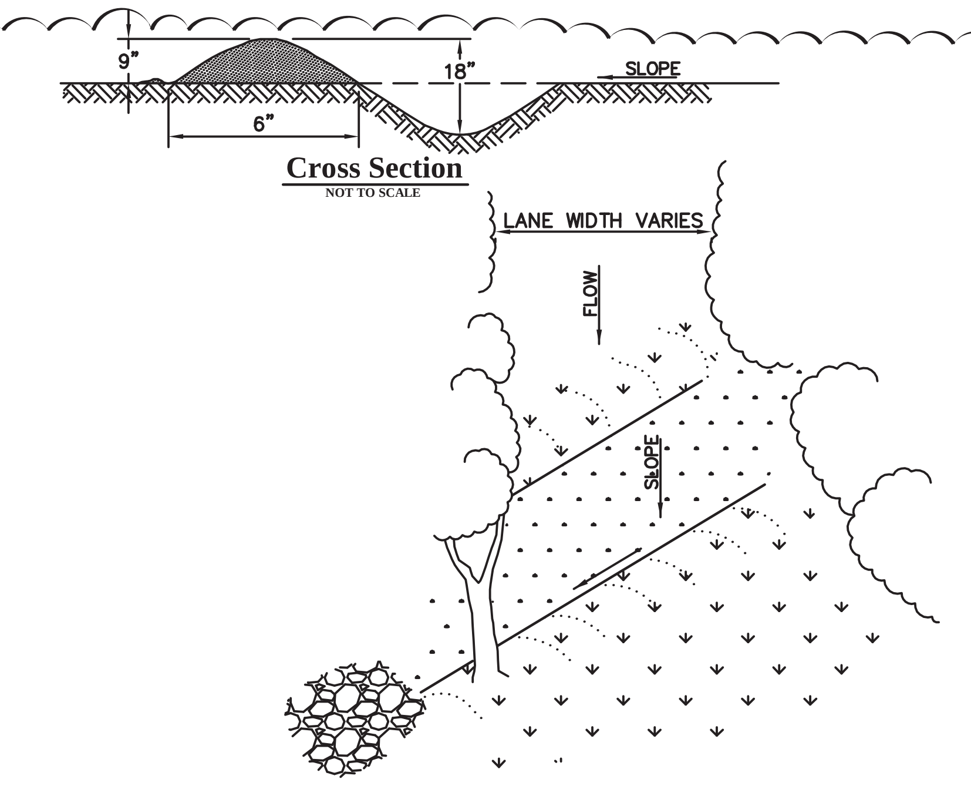
The problems presented in attempting to provide cathodic protection for existing bare structures are much more difficult than those on coated structures. The major difficulty arises because of the much greater magnitude of current required. On a well-coated underground storage tank, it is not unusual to be able to provide protection with one or two galvanic anodes while it is not uncommon to have several rectifier units in a large complex tank farm.

Because of the much greater current requirement, interference problems can be created on other nearby underground utility systems. On systems using sacrificial anodes, the number of anodes required is similarly much greater on bare structures than on coated.
We have seen one example where one anode was sufficient to provide protection for a coated 10,000 gallon tank. On the other hand, a poorly coated or bare 10,000 gallon tank can require in excess of 1.5 amps to achieve effective corrosion control. For one bare UST piping system in Ohio consisting of 1,200 feet of 3" diameter pipe, 2 amperes of current was required for full corrosion control. If magnesium anodes were selected for use, over 60 anodes would be required.

VII. Conclusion

Cathodic protection is a highly adaptable and effective means of preventing corrosion on a variety of underground or underwater structures. There are basically two types of systems: namely, galvanic and impressed current. Each has characteristics which make it more adaptable' under given circumstances. Cathodic protection designs can differ considerably depending upon the coating, the configuration of the structure, the environment and the presence of neighboring structures. When a system is designed, installed and maintained properly, cathodic protection is one of the most effective and economical methods of preventing corrosion.

Attachment 10



Construction Specifications

1. INSTALL THE WATER BAR AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
2. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
3. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
4. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.
5. FOR PERMANENT WATER BARS, VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE SEEDED AND MULCHED. FOR TEMPORARY WATER BARS, VEHICLE CROSSING SHALL BE COMPACTED AND MAINTAINED PER THESE SPECIFICATIONS. FOLLOWING THEIR USE, WATER BARS SHALL BE REGRADED TO MATCH PRE-CONSTRUCITON CONDITIONS. TOPSOIL SHALL BE RE-APPLIED THEN ALL AREAS OF EXPOSED SOIL SHALL BE FULLY STABILIZED PER THE EPSC PLAN.
6. INSPECT WATER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.
7. SPACING:

SLOPE (%)	SPACING (FT)
<5	125
5–10	100
10–20	75
20–35	50
>35	25

1 Water Bars

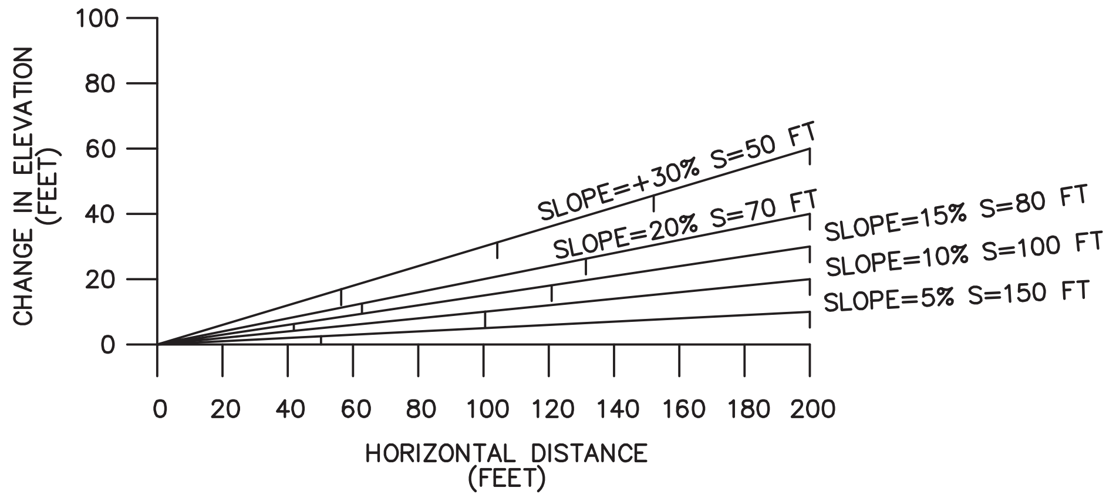
10/13

N.T.S.

Source: Vermont Standards and Specs for EPSC 2006

LD_

2



NOTE: S = TRENCH BREAKER SPACING

NOTES:

1. PERMANENT TRENCH BREAKER SANDBAGS SHALL NOT BE FILLED WITH TOPSOIL.
2. SPACINGS SHOWN ARE RECOMMENDED GUIDELINES. OSPC REPRESENTATIVE MAY ADJUST SPACING IN THE FIELD.
3. ONE TRENCH BREAKER IS REQUIRED AT ALL STREAM BANKS AND AT WETLAND BOUNDARIES.

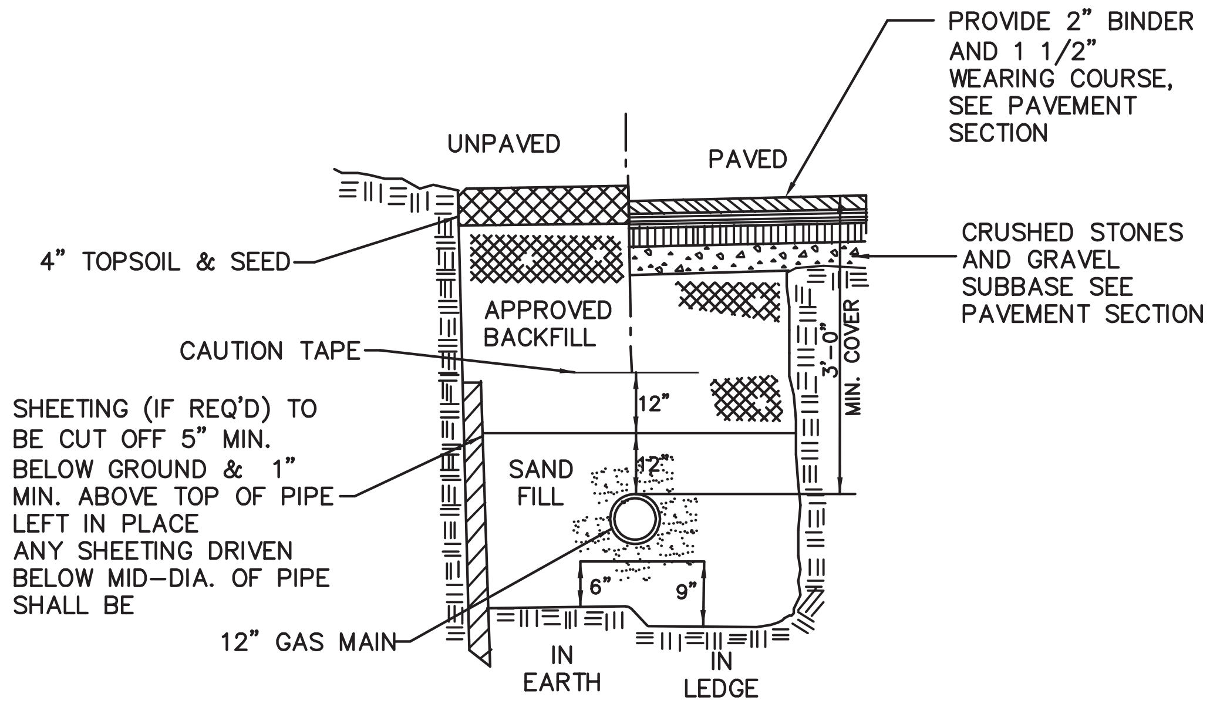
2 Permanent Trench Break Spacing Guideline

12/12

N.T.S.

Source: CHA

LD_



NOTES:

1. BACKFILL MATERIAL TO CONSIST OF GRANULAR MATERIAL CONTAINING NO STONES OR CLODS LARGER THAN 3" IN GREATEST DIMENSION. IN RESOURCE AREAS BACKFILL TO CONSIST OF NATIVE SUBSOIL AND TOPSOIL.
2. BACKFILL WITH CLEAN SAND TO 12" OVER PIPE.
3. REMOVE UNSUITABLE MATERIAL BELOW GRADE IF ENCOUNTERED, TO SUITABLE DEPTHS AS DIRECTED BY ENGINEER AND REPLACE WITH CLEAN GRANULAR FILL.
4. IN RESOURCE AREAS (E.G., WETLANDS AND PAS AREAS) SUBSOIL TO BE BACKFILLED TO MATCH DEPTH OF ADJACENT NATIVE, UNDISTURBED SUBSOIL/TOPSOIL INTERFACE FOLLOWED BY BACKFILL OF NATIVE TOPSOIL. EXCESS SUBSOIL TO BE PROPERLY DISPOSED OF AND STABILIZED.
5. ALL TRENCH CONSTRUCTION TO CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
6. ALL BACKFILL MATERIAL, WITH THE EXCEPTION OF RESOURCE AREAS (SEE NOTE #4), SHALL BE COMPACTED AT NEAR OPTIMUM MOISTURE CONTENT IN LAYERS NOT EXCEEDING 6 INCHES IN COMPACTED THICKNESS BY PNEUMATIC TAMPERS, VIBRATOR COMPACTORS, OR OTHER APPROVED MEANS.
7. THE CONTRACTOR SHALL PROVIDE TESTING TO INSURE THAT THE INPLACE DENSITY OF THE BACKFILL MEETS THE ABOVE REQUIREMENTS.

3 Typical Trench Detail

2/13

N.T.S.

Source: CHA

LD_

CHA PLAN SHEET #	TOWN	PROJECT COMPONENT	PLANT ID CODE	STATE RANK	MATTING LOCATIONS (STATION)
ANGP–EPSC–014	WILLISTON	TRANSMISSION (ACCESS ROAD)	2012–RTE–CT–031	S2/S3	366+50 TO 368+75 AND ON ACCESS ROAD
ANGP–EPSC–022	WILLISTON	TRANSMISSION	2012–RTE–CT–084	S2/S3	562+50 TO 563+75
ANGP–EPSC–039	HINESBURG	TRANSMISSION	2012–RTE–CT–080	S2/S3	992+80 TO 993+50
ANGP–EPSC–039	HINESBURG	TRANSMISSION	2012–RTE–CT–081	S2/S3	1001+20 TO 1002+20
ANGP–EPSC–039	HINESBURG	TRANSMISSION	2012–RTE–CT–082	S2/S3	1003+50 TO 1005+80
ANGP–EPSC–040	HINESBURG	TRANSMISSION	2012–RTE–CT–041	S2/S3	1021+20 TO 1023+00
ANGP–EPSC–051	MONKTON	TRANSMISSION	2012–RTE–ACT–083	S2/S3	1302+10 TO 1307+90
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–CT–051	S2/S3	1649+50 TO 1652+00
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–CT–061	S2/S3	1665+50
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–AT–053	S1	1659+60
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–LV–054	S2	1659+60
ANGP–EPSC–066	NEW HAVEN	TRANSMISSION	2012–RTE–AT–063	S1	1669+70 TO 1670+50
ANGP–EPSC–075, 079, 077	NEW HAVEN	TRANSMISSION	2012–RTE–CT–069	S2/S3	1918+00 TO 1966+50
ANGP–EPSC–V011	FERRISBURGH	DISTRIBUTION MAIN	2012–RTE–CT–068	S2/S3	118+80 TO 119+10

Notes:

1. INSTALL CONSTRUCTION MATS ON STATION LOCATIONS LISTED IN TABLE TO PROTECT RARE PLANT SPECIES.
2. LIMIT DURATION OF MATTING DURING GROWING SEASON TO EXTENT PRACTICABLE.
3. REMOVE MATTING IMMEDIATELY FOLLOWING THEIR USE. FOR EXAMPLE, WHERE MATTING IS USED FOR TEMPORARY STOCKPILING OF SOIL FROM TRENCHING OPERATIONS, REMOVE MATTING IMMEDIATELY FOLLOWING BACKFILL OPERATIONS.
4. AT A MINIMUM, MATTING IS NOT TO BE LEFT IN PLACE FOR MORE THAN 28 DAYS WHERE FEASIBLE.
5. REFER TO ADDITIONAL ENVIRONMENTAL NOTE 12 ON SHEET ANGP–T–G–011

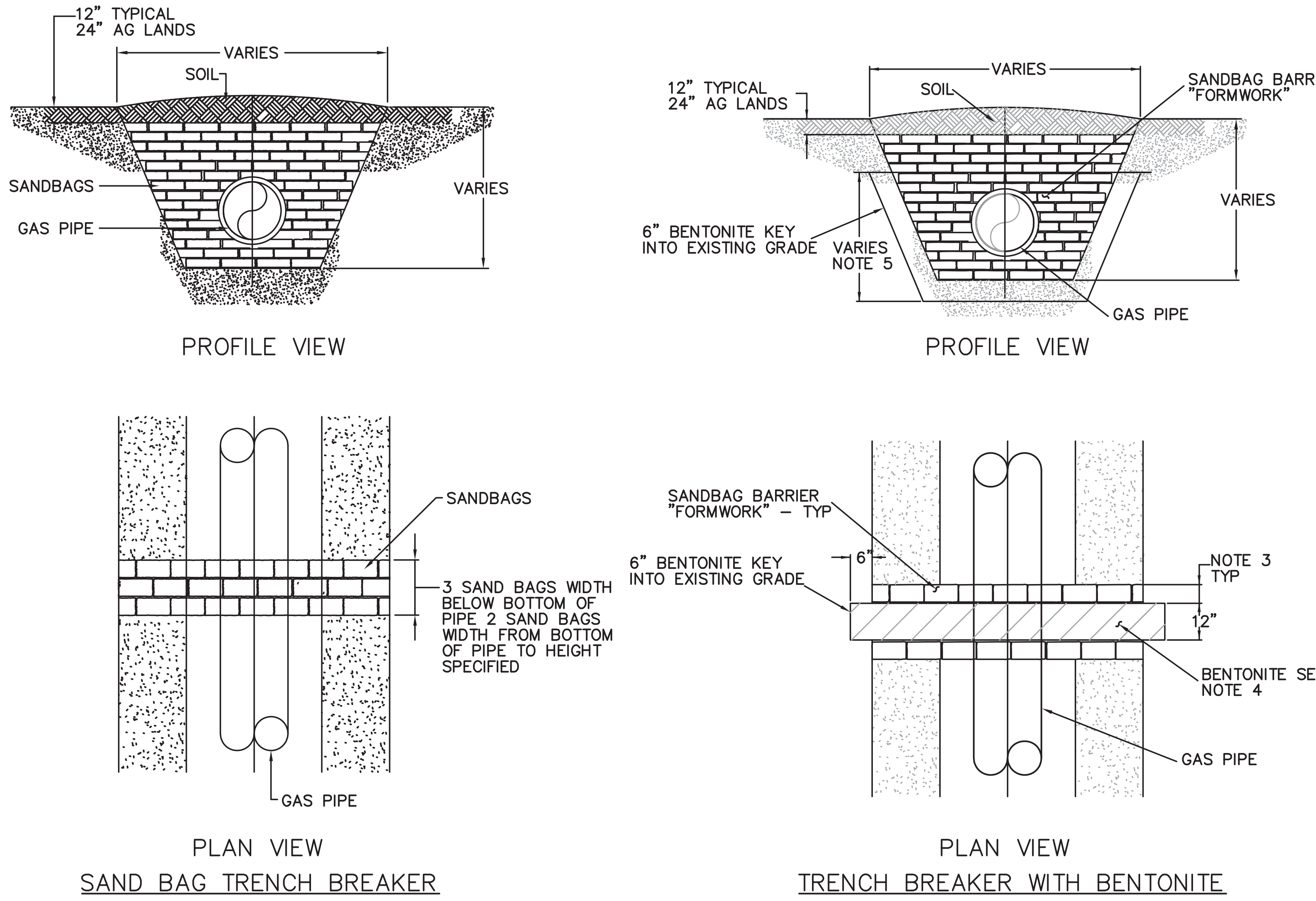
4 RTE Matting Table

09/13

N.T.S.

Source: VHB

2



SAND BAG TRENCH BREAKER

TRENCH BREAKER WITH BENTONITE

NOTES:

1. PERMANENT TRENCH BREAKER WITH BENTONITE SEAL IS INTENDED TO PROHIBIT WATER FLOW THROUGH THE BREAKER.
2. PERMANENT TRENCH BREAKER WITH BENTONITE SEAL TO BE INSTALLED AT EDGE OF WETLANDS AND STREAMS.
3. SAND BAG BARRIER WIDTH SHALL BE MINIMUM 1 BAG WIDE AND/OR AS FIELD DETERMINED TO PROVIDE STABILITY.
4. BENTONITE IS TO BE INSTALLED IN THE VOID SPACE BETWEEN THE SANDBAG BARRIER "FORMWORK" IN SUCH A MANNER TO COMPLETELY SURROUND THE PIPE AND FILL THE VOID FROM THE BOTTOM OF THE TRENCH TO A HEIGHT 6" ABOVE THE LEVEL OF IMPORTED PADDING MATERIAL WHICH IS INSTALLED ON THE EXTERIOR SIDE OF THE SANDBAG BARRIER IN THE WETLAND ZONE.
5. AFTER BENTONITE PLACEMENT, INSTALL SAND BAGS ON TOP OF THE PERMANENT TRENCH BREAKER AND BENTONITE SEAL TO THE REQUIRED HEIGHT PER DETAIL 2 AND BACKFILL EXTERIOR SIDES OF SAND BAG BARRIERS.

2

5 Permanent Trench Break or Sandbags

12/12

N.T.S.

Source: CHA

LD_

2

VHB Vanasse Hangen Brustlin, Inc.

						BID		CONSTRUCTION		
					ENVIRONMENTAL	JLS	06/28/13	JLS	05/23/14	
					DRAFTING DESIGNER	GIL	06/28/13	GIL	05/23/14	
		2	MDF	TDB	ISSUED FOR ADDITIONAL PERMIT REVIEW (10/14/13)	DRAFTING SUPERVISOR	BZD	06/28/13	DTB	05/23/14
		1	MDF	TDB	ISSUED FOR ADDITIONAL PERMIT REVIEW (9/20/13)	DESIGN ENGINEER	MDF	06/28/13	MDF	05/23/14
		0	MDF	SAB	ISSUED FOR CONSTRUCTION	DESIGN MANAGER	SAB	06/28/13	SAB	05/23/14
DWG. NO.	REFERENCE DWG.	REV	DSN	CK	DESCRIPTION		INITIALS	DATE	INITIALS	DATE

VERMONT GAS
PROPOSED 12" PIPELINE
ADDISON NATURAL GAS PROJECT
CONSTRUCTION DETAILS

LOC. CHITTENDEN & ADDISON COUNTIES

Vermont Gas

CHA
36 Cordage Park Circle , Suites 321, 326, 329, 336
Plymouth, MA 02360
Main: (781) 982-7700 · www.chacompanies.com

YEAR: 2014 | W.O. | SCALE: NOTED | DWG. ANGP–T–G–015 | REV. 2

Attachment 11

Vermont Gas

Page 1 of 2
Corrective/Preventive Action Request (CPAR)

CA ☒ PA ☐

(Check appropriate box to indicate corrective or preventive action)

Initiator: K. Oxholm

Date: 11/18/2015

Corrective Action # 2015-006

or

Preventive Action # ____

	Date Due	By/Assigned to	Completed Initials & Date
Investigation	12/9/2015	Christopher LeForce	CAL 12/11/2015
Implementation	12/11/2015	Christopher LeForce	CAL 12/11/2015
Audit			
CAR/PAR closed			

Description of Issue

In areas where pipe was installed by the 2014 Contractor (Over & Under) on ANGP, trench breakers were not installed as designed in numerous locations. A table attached, titled "ANGP Trench Breaker As-built 2014 (Segment 1)", shows the general design locations by station number and the corresponding as-built location if installed. There were both sand trench breakers and bentonite trench breakers on this list. Also there were some trench breakers installed where there was not a designed location.

Work Processes need to be modified or ceased during investigation?: Yes ___ No x

If so, specify:

Approved by:

Date: 12/11/15

Investigation Finding

The list titled "ANGP Trench Breaker As-built 2014 (Segment 1)" was reviewed and the locations plotted on a set of design drawings. After talking to field personnel (inspectors), it was determined that some of the locations where trench breakers were designed on paper were omitted because the field conditions warranted them not to be installed. On the other hand there were locations where there was no designed trench breaker, but field conditions warranted one to be installed. There was no documentation of this process.

Rev. 0 07/24/2015

Vermont Gas

Page 2 of 2
Corrective/Preventive Action Request (CPAR)

Recommendations for Corrective / Preventive Action

VGS will investigate the areas where a designed trench breaker was not installed. If field conditions show that one is not needed, then it will be documented as to the reason why not. If one is needed, then one will be scheduled to be installed.

While this investigation takes place, VGS Operations will patrol the transmission corridor on a monthly basis or after any significant rain event to ensure no erosion occurs due to the lack of a trench breaker. If VGS Operations finds erosion occurring, it will be remediated to ensure the safety of the pipeline.

Action Taken / Verification

An aerial patrol was conducted on Jan. 20, 2016 (included the 12-inch transmission line from Colchester to Williston) and no issues were observed.

VGS performed a walking survey on Feb. 18, 2016 from Severance Road to Williston Gate. No issues were noted such as washouts, soil erosion, unusual ground conditions, etc.

This line segment was monitored throughout 2016 through aerial patrols and the 2016 walking survey. No areas of concern were observed.

VGS continues to monitor this segment of the 12-inch transmission line as part of its overall transmission line patrols.

Any future re-evaluation and follow-up required? Yes x No ___
If so, specify:

As required by code, the transmission corridor is continually patrolled multiple times each year by VGS Operations and one of the items that is looked for is erosion areas or potential erosion areas. Anything that is deemed a threat to the pipe will be remediated by VGS Operations.

Verified by: ________ Date: 8/17/17

Was action taken effective? ☒ Yes ☐ No If no, new CA/PA number: ________

Comments: No corrective action has been required.

Rev. 0 07/24/2015

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
NONE	N/A	129+15	SAND	
NONE	N/A	132+62	SAND	
NONE	N/A	144+15	SAND	
NONE	N/A	147+22	SAND	
NONE	N/A	150+10	SAND	
187+75	BENTONITE	NONE	N/A	
188+50	BENTONITE	188+78	BENTONITE	
NONE	N/A	189+14	SAND	
NONE	N/A	190+10	SAND	
190+55	BENTONITE	190+53	BENTONITE	
193+15	BENTONITE	193+56	BENTONITE	
194+55	SAND	NONE	N/A	
195+80	SAND	NONE	N/A	
197+00	SAND	NONE	N/A	
202+17	SAND	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

▨	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
202+95	SAND	NONE	N/A	
211+90	SAND	NONE	N/A	
NONE	N/A	238+79	SAND	
328+10	SAND	327+77	SAND	
328+92	SAND	328+64	SAND	
330+65	SAND	331+22	SAND	
331+40	SAND	331+66	SAND	
343+62	SAND	NONE	N/A	
344+35	SAND	344+50	SAND	
345+08	SAND	345+02	SAND	
347+42	SAND	NONE	N/A	
348+00	SAND	347+80	SAND	
348+60	SAND	NONE	SAND	
348+80	BENTONITE	348+45	BENTONITE	
349+25	BENTONITE	349+52	BENTONITE	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

▨	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
350+72	BENTONITE	350+72	BENTONITE	
351+06	BENTONITE	351+06	BENTONITE	
367+30	BENTONITE	367+40	BENTONITE	
369+12	BENTONITE	368+72	BENTONITE	
369+47	SAND	NONE	N/A	
370+45	BENTONITE	NONE	N/A	
371+10	BENTONITE	NONE	N/A	
374+22	SAND	NONE	N/A	
375+05	SAND	NONE	N/A	
380+45	SAND	NONE	N/A	
381+40	SAND	NONE	N/A	
380+75	BENTONITE	380+80	BENTONITE	
382+10	BENTONITE	NONE	N/A	
382+60	BENTONITE	NONE	N/A	
384+00	BENTONITE	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
384+60	BENTONITE	NONE	N/A	
385+00	BENTONITE	386+12	BENTONITE	
401+49	SAND	NONE	N/A	
403+00	SAND	NONE	N/A	
404+93	SAND	NONE	N/A	
406+42	SAND	NONE	N/A	
407+96	SAND	NONE	N/A	
409+48	SAND	NONE	N/A	
411+00	SAND	NONE	N/A	
429+35	BENTONITE	429+30	BENTONITE	
429+05	BENTONITE	429+43	BENTONITE	
429+50	SAND	NONE	N/A	
430+30	SAND	NONE	N/A	
433+50	SAND	433+53	SAND	
435+00	SAND	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

▨	Sand Trench Breaker
🟨	Bentonite Trench Breaker

"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
436+90	BENTONITE	436+70	BENTONITE	
NONE	N/A	437+00	BENTONITE	
437+20	BENTONITE	437+19	BENTONITE	
440+50	BENTONITE	440+22	BENTONITE	
440+70	BENTONITE	441+10	BENTONITE	
448+40	BENTONITE	447+75	BENTONITE	
449+30	BENTONITE	449+09	BENTONITE	
459+50	BENTONITE	NONE	N/A	
460+15	BENTONITE	460+09	BENTONITE	
466+05	BENTONITE	466+00	BENTONITE	
466+55	BENTONITE	466+50	BENTONITE	
468+70	BENTONITE	468+62	BENTONITE	
469+30	BENTONITE	469+35	BENTONITE	
506+45	BENTONITE	NONE	N/A	
507+30	BENTONITE	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

⬜	Sand Trench Breaker
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"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
510+25	BENTONITE	509+90	BENTONITE	
511+80	BENTONITE	NONE	N/A	
514+70	BENTONITE	514+89	BENTONITE	
515+50	BENTONITE	515+45	BENTONITE	
540+35	BENTONITE	540+43	BENTONITE	
540+65	BENTONITE	537+60 (STA EQN.)	BENTONITE	
546+30	BENTONITE	546+09	BENTONITE	
547+35	BENTONITE	547+62	BENTONITE	
548+00	BENTONITE	NONE	N/A	
NONE	N/A	549+68	Unk.*	need to confirm with survey TRBKR type
551+00	BENTONITE	NONE	N/A	
552+60	BENTONITE	553+30	Unk.*	need to confirm with survey TRBKR type

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

LEGEND:

🟫	Sand Trench Breaker
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"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
NONE	N/A	129+15	SAND	
NONE	N/A	132+62	SAND	
NONE	N/A	144+15	SAND	
NONE	N/A	147+22	SAND	
NONE	N/A	150+10	SAND	
187+75	BENTONITE	NONE	N/A	
188+50	BENTONITE	188+78	BENTONITE	
NONE	N/A	189+14	SAND	
NONE	N/A	190+10	SAND	
190+55	BENTONITE	190+53	BENTONITE	
193+15	BENTONITE	193+56	BENTONITE	
194+55	SAND	NONE	N/A	
195+80	SAND	NONE	N/A	
197+00	SAND	NONE	N/A	
202+17	SAND	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

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▨	Sand Trench Breaker
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"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
202+95	SAND	NONE	N/A	
211+90	SAND	NONE	N/A	
NONE	N/A	238+79	SAND	
328+10	SAND	327+77	SAND	
328+92	SAND	328+64	SAND	
330+65	SAND	331+22	SAND	
331+40	SAND	331+66	SAND	
343+62	SAND	NONE	N/A	
344+35	SAND	344+50	SAND	
345+08	SAND	345+02	SAND	
347+42	SAND	NONE	N/A	
348+00	SAND	347+80	SAND	
348+60	SAND	NONE	SAND	
348+80	BENTONITE	348+45	BENTONITE	
349+25	BENTONITE	349+52	BENTONITE	

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NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

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350+72	BENTONITE	350+72	BENTONITE	
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367+30	BENTONITE	367+40	BENTONITE	
369+12	BENTONITE	368+72	BENTONITE	
369+47	SAND	NONE	N/A	
370+45	BENTONITE	NONE	N/A	
371+10	BENTONITE	NONE	N/A	
374+22	SAND	NONE	N/A	
375+05	SAND	NONE	N/A	
380+45	SAND	NONE	N/A	
381+40	SAND	NONE	N/A	
380+75	BENTONITE	380+80	BENTONITE	
382+10	BENTONITE	NONE	N/A	
382+60	BENTONITE	NONE	N/A	
384+00	BENTONITE	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

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404+93	SAND	NONE	N/A	
406+42	SAND	NONE	N/A	
407+96	SAND	NONE	N/A	
409+48	SAND	NONE	N/A	
411+00	SAND	NONE	N/A	
429+35	BENTONITE	429+30	BENTONITE	
429+05	BENTONITE	429+43	BENTONITE	
429+50	SAND	NONE	N/A	
430+30	SAND	NONE	N/A	
433+50	SAND	433+53	SAND	
435+00	SAND	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

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437+20	BENTONITE	437+19	BENTONITE	
440+50	BENTONITE	440+22	BENTONITE	
440+70	BENTONITE	441+10	BENTONITE	
448+40	BENTONITE	447+75	BENTONITE	
449+30	BENTONITE	449+09	BENTONITE	
459+50	BENTONITE	NONE	N/A	
460+15	BENTONITE	460+09	BENTONITE	
466+05	BENTONITE	466+00	BENTONITE	
466+55	BENTONITE	466+50	BENTONITE	
468+70	BENTONITE	468+62	BENTONITE	
469+30	BENTONITE	469+35	BENTONITE	
506+45	BENTONITE	NONE	N/A	
507+30	BENTONITE	NONE	N/A	

ANGP Trench Breaker Locations As-Built 2014 (Segment 1)

NOTE: The following approximate stations are the minimum locations for both sand and bentonite trench breakers for Segment 1 (As Built 2014) of the Addison Natural Gas Project. This list was created using information from details #2 and #5 on drawing ANGP-T-G-015 Rev. 1 from the Plan Set titled "Addison Natural Gas Project Transmission Mainline" dated 04-02-15. The Construction Management Team/Inspectors should review actual field conditions and direct the Contractor to install additional trench breakers as necessary to supplement the listed areas.

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"Theoretical Station"	Type	As-Built Station	As-Built Type	Comments
510+25	BENTONITE	509+90	BENTONITE	
511+80	BENTONITE	NONE	N/A	
514+70	BENTONITE	514+89	BENTONITE	
515+50	BENTONITE	515+45	BENTONITE	
540+35	BENTONITE	540+43	BENTONITE	
540+65	BENTONITE	537+60 (STA EQN.)	BENTONITE	
546+30	BENTONITE	546+09	BENTONITE	
547+35	BENTONITE	547+62	BENTONITE	
548+00	BENTONITE	NONE	N/A	
NONE	N/A	549+68	Unk.*	need to confirm with survey TRBKR type
551+00	BENTONITE	NONE	N/A	
552+60	BENTONITE	553+30	Unk.*	need to confirm with survey TRBKR type

Transmission Patrol/Survey Report

Type of Patrol and/or Survey
Aerial

Conducted on
2/18/16 12:00 PM

Prepared by
306

Personnel
273/282/306/407

Survey Instrument Type
FI Unit

Survey Instrument Serial Number
9929/9662

Calibration Check Date and Time
2/18/16 7:00 AM

Start Time
12:00 PM

End Time
3:00 PM

Score
0/13 - 0%

Disclaimer

The assessors believe the information contained within this risk assessment report to be correct at the time of printing. The assessors do not accept responsibility for any consequences arising from the use of the information herein. The report is based on matters which were observed or came to the attention of the assessors during the day of the assessment and should not be relied upon as an exhaustive record of all possible risks or hazards that may exist or potential improvements that can be made.

Information on the latest workers compensation and OHS / WHS laws can be found at the relevant State WorkCover / WorkSafe Authority.

Confidentiality Statement

In order to maintain the integrity and credibility of the risk assessment processes and to protect the parties involved, it is understood that the assessors will not divulge to unauthorized persons any information obtained during this risk assessment unless legally obligated to do so.

Table of Contents

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Segment(s) Patrolled 4
Conditions Noted 5
REVIEW 7
Review 7

Audit - 0/13 - 0%

Question	Response	Details
River Crossings		*Score (0/7) 0%*
Rock River 10"		
Rock River 16"		
Missisquoi River 10"		
Missisquoi River 16"		
Lamoille River 10"		
Winooski River 10"		
Severance Rd to Williston Gate 12"	Follow-up Needed	
If the response if follow up needed then show		
Type of follow up	Winooski River crossing ok	
Picture(s)		
Work order #		
Segment(s) Patrolled		*Score (0/6) 0%*
10" Line from Canadian Border to Winooski Gate		
16" Line from Canadian Border to Reynolds Road		
4" and 6" Lateral to Sheldon		
8" Lateral to North Burlington Gate		
6" Lateral to McNeil Plant		
If the response is follow up needed then show		

Question	Response	Details
Location		
Picture		
Description of needed follow up		
Work order #		
Conditions Noted		
Excavations	No	
Grading	No	
Washouts	No	
Exposed Pipe	No	
Unusual Ground Conditions	No	
Demolition	No	
Nearby Blasting	No	
Construction Activity	No	
Building Encroachment	No	
Soil Erosion	No	
Visible Evidence of Leakage	No	
Need for Additional Markers	Yes	
Explanation:		
Explanation 1		
Location		
Photo(s)		
Description of needed follow-up:	A little clearing and installation of additional signs would make line easier to follow in Sand Plains area.	
Work Order #:		

Question	Response	Details
Deterioration of Pipe and/or Supports	No	
Subsidence or Other Natural Causes	No	
Deformation of Pipe or Support due to Expansion or Contraction	No	
Atmospheric Corrosion on Exposed Pipe	No	
Inadequate Condition of Coating on Exposed Pipe	No	
Change in Population Density or Prevalence of 4 Story Buildings	No	
Vandalism/Damage	No	
Road/rail Crossing in Need of Follow-up	No	
Trees or Other Obstacles in Right of Way	No	
Other	No	

Score (0/13) 0%

Review

<table>
<tr><th colspan="2">Question</th><th>Response</th><th>Details</th></tr>
<tr><td colspan="4">Review</td></tr>
<tr><td>Reviewed by:</td><td>Steve miner</td><td>2/19/16
6:53 AM</td><td></td></tr>
<tr><td colspan="2">Date</td><td colspan="2">2/19/16 6:54 AM</td></tr>
</table>

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1

Date: 1/20/16

By: 282

Patrol Method: **Flying Fixed Wing Plane**

Class Location: 3

Transmission line Area: Patrolled

- X **10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)**
- X **6" Transmission line Station 00+00 (Border gate) to Nason Street**
- X **4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)**
- X **8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)**
- X **6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)**
- X **8" & 10" ESB Lateral Station 00+00 (Winooski gat) to 31+36 (Essex/SB gate)**
- X **12" ARNGP Transmission Line addition – Col to Williston**

Construction Activity: Yes [✓ No]

Pictures Taken: Yes [✓ No]

Explain:

Excavation Activity: Yes [✓ No]

Pictures Taken: Yes [✓ No]

Explain:

Observations and Comments:

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

1/20/16

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1

Date: 2/17/16

By: 306

Patrol Method: (circle one) **Flying**

Class Location: 3

Transmission line Area: Patrolled

☒ **10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)**

☒ **16" Transmission line Station 00+00 (Border gate) to Nason Street**

☒ **4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)**

☒ **8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)**

☒ **6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)**

X/12"

Explain:

Excavation Activity: Yes - [✓ No]

Pictures Taken: Yes - [✓ No]

Explain:

Observations and Comments:

2/18/16

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1	Date: 3/17/16	By: 306 - GP
Patrol Method: Flying Fixed Wing Plane		Class Location: 3

Transmission line Area: Patrolled

____x_ 10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)

____x_ 6" Transmission line Station 00+00 (Border gate) to Nason Street

____x_ 4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)

____x_ 8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)

____x_ 6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)

____x_ 8" & 10" ESB Lateral Station 00+00 (Winooski gat) to 31+36 (Essex/SB gate)

____x_ 12" ARNGP Transmission Line addition – Col to Williston

Construction Activity: Yes ____ No _x_

Pictures Taken: Yes _____ No ___x__

Explain:

Excavation Activity: Yes ____ No __x_

Pictures Taken: Yes _____ No ___x_

Explain:

Observations and Comments: SM 3/18/2016

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

SM 3/18/2016

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1	Date: 5/18/15	By: 407
Patrol Method: Flying Fixed Wing Plane		Class Location: 3

Transmission line Area: Patrolled

- ✓ **10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)**
- ✓ **16" Transmission line Station 00+00 (Border gate) to Nason Street**
- ✓ **4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)**
- ✓ **8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)**
- ✓ **6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)**
- ✓ **8" & 10" ESB Lateral Station 00+00 (Winooski gat) to 31+36 (Essex/SB gate)**
- ✓ **12" ARNGP Transmission Line addition – Col to Williston**

Construction Activity: Yes ___ No ✓

Pictures Taken: Yes ___ No ✓

Explain:

Excavation Activity: Yes ___ No ✓

Pictures Taken: Yes ___ No ✓

Explain:

Observations and Comments:

SM 5/18/2016

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1	Date: 6/15/16	By: 394
Patrol Method: Flying Fixed Wing Plane		Class Location: 3

Transmission line Area: Patrolled

X **10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)**

X **16" Transmission line Station 00+00 (Border gate) to Nason Street**

X **4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)**

X **8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)**

X **6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)**

___ **8" & 10" ESB Lateral Station 00+00 (Winooski gat) to 31+36 (Essex/SB gate)**

X **12" ARNGP Transmission Line addition – Col to Williston**

Construction Activity: ___ Yes [✓ No]

Pictures Taken: ___ Yes ___ No

Explain:

Excavation Activity: ___ Yes ___ No

Pictures Taken: ___ Yes [✓ No]

Explain:

Observations and Comments:

6/15/2016

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1

Date: 8|19|2016

By: 394 K.M.

Patrol Method: Flying Fixed Wing Plane

Class Location: 3

Transmission line Area: Patrolled

- X 10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)
- X 16" Transmission line Station 00+00 (Border gate) to Nason Street
- X 4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)
- X 8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)
- X 6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)
- ___ 8” & 10” ESB Lateral Station 00+00 (Winooski gat) to 31+36 (Essex/SB gate)
- X 12” ARNGP Transmission Line addition – Col to Williston

Construction Activity: [✓ Yes] No

Pictures Taken: [✓ Yes] No

Explain: VGS work at Sandy Birch Station & Phase VII Reynolds Rd to Sandy Birch

Excavation Activity: [✓ Yes] No

Pictures Taken: [✓ Yes] No

Explain: Same as above

Observations and Comments:

8|19|2016

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

VERMONT GAS SYSTEMS - TRANSMISSION LINE
Fixed Wing Air Plane Patrol

PATROL #1	Date: 10/19/16	By: 306
Patrol Method: Flying Fixed Wing Plane		Class Location: 3

Transmission line Area: Patrolled

✓ 10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)

✓ 16" Transmission line Station 00+00 (Border gate) to ~~Nason Street~~ Reynolds Rd

✓ 4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)

✓ 8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)

✓ 6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)

✓ 8" & 10" ESB Lateral Station 00+00 (Winooski gat) to 31+36 (Essex/SB gate)

✓ 12" ARNGP Transmission Line addition – Col to ~~Williston~~ Middlebury

Construction Activity: [✓ Yes] No

Pictures Taken: Yes [✓ No]

Explain: 16" Expansion Reynolds Rd To Sandy Birth Rd. Georgia

12" Expansion Hurricane Ln. Wil To Rt 7 Middlebury

Excavation Activity: [✓ Yes] No

Pictures Taken: Yes No

Explain: Acadia Lane Williston, Installing Conduit Over 12" To Feed Proposal Development.

Observations and Comments:

10/19/2016

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1	Date: 11/28/16	By: 407
Patrol Method: Flying Fixed Wing Plane		Class Location: 3

Transmission line Area: Patrolled

✓ **10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)**

✓ **16" Transmission line Station 00+00 (Border gate) to Nason Street**

✓ **4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)**

✓ **8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)**

✓ **6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)**

✓ **12" ARNGP Transmission Line addition – Col to Middlebury**

Construction Activity: Yes [✓ No]

Pictures Taken: Yes [✓ No]

Explain:

Excavation Activity: [✓ Yes] No

Pictures Taken: Yes [✓ No]

Explain: Some back-filling being done by Michaels on the 12"

Observations and Comments:

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

11/28/16

VERMONT GAS SYSTEMS - TRANSMISSION LINE

Fixed Wing Air Plane Patrol

PATROL #1	Date: 12/20/16	By: 407
Patrol Method: Flying Fixed Wing Plane		Class Location: 3

Transmission line Area: Patrolled

- ✓ **10" Transmission line Station 00+00 (Border gate) to 2110+50 (Winooski gate)**
- ✓ **16" Transmission line Station 00+00 (Border gate) to Nason Street**
- ✓ **4"&6" Sheldon lateral Station 00+00 (Beebe gate) to 369+00 (Sheldon gate)**
- ✓ **8" NOB lateral Station 00+00 (Camp Johnson) to 263+00 (Convent Sq gate)**
- ✓ **6" Intervale lateral Station 00+00 (Main Line valve) to 28+30 (McNeil gate)**
- ✓ **12" ARNGP Transmission Line addition – Col to Middlebury**

Construction Activity: ✓ Yes ___ No

Pictures Taken: ___ Yes ___ No

Explain: Excavator working between Sandy birch and Sodom Rd

Excavation Activity: ___ Yes ___ No

Pictures Taken: ___ Yes ___ No

Explain:

Observations and Comments:

Sell 1/3/17 - Tatro removing Matl on Phase 7 construction per Lee Brown

L:Shared\LOOP OPER\Leak Surveys and Patrols\transmission fixed wing air plane patrol

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
8	Bartletts	Way	Colchester0000.pdf	1501-4thwood	N	N	N	N	—	9/26/16	Premier
17	Bartletts	Way	Colchester0000.pdf		N	N	N	N	—		
6 thru 8	Bay	Hollow	Colchester0000.pdf		N	N	N	N	—	9/26/16	
21	Bay	Road	Colchester0000.pdf		N	N	N	N	—	9/27/16	
32	Bay	Road	Colchester0001.pdf								
34	Bay	Road	Colchester0002.pdf								
67	Bay	Road	Colchester0000.pdf								
68	Bay	Road	Colchester0003.pdf								
70	Bay	Road	Colchester0004.pdf								
89	Bay	Road	Colchester0005.pdf								
89	Bay	Road	Colchester0000.pdf								
102	Bay	Road	Colchester0006.pdf								
103	Bay	Road	Colchester0007.pdf								
116	Bay	Road	Colchester0000.pdf								
117	Bay	Road	Colchester0000.pdf								
148	Bay	Road	Colchester0000.pdf								
477	Bay	Road	Colchester0000.pdf								
521	Bay	Road	Colchester0000.pdf								
547	Bay	Road	Colchester0000.pdf								
627	Bay	Road	Colchester0008.pdf								
836	Bay	Road	Colchester0009.pdf								
838	Bay	Road	Colchester0010.pdf								
875	Bay	Road	Colchester0011.pdf								
880	Bay	Road	Colchester0012.pdf								
899	Bay	Road	Colchester0013.pdf								
925	Bay	Road	Colchester0014.pdf								
1149	Bay	Road	Colchester0015.pdf								
1169	Bay	Road	Colchester0016.pdf								
1195	Bay	Road	Colchester0017.pdf								
1215	Bay	Road	Colchester0018.pdf								
1243	Bay	Road	Colchester0020.pdf								
1267	Bay	Road	Colchester0019.pdf								
6	Bayview	Road	Colchester0000.pdf		N	N	N	N	—	9/26/16	
18	Bayview	Road	Colchester0001.pdf								
035-37	Bayview	Road	Colchester0002.pdf								
54	Bayview	Road	Colchester0003.pdf								
55	Bayview	Road	Colchester0004.pdf								
107	Bayview	Road	Colchester0005.pdf								

MRA 11-10-16

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
117	Bayview	Road	Colchester0006.pdf	1501-442006	N	N	N	N	—	4/22/16	Premier
148	Bayview	Road	Colchester0007.pdf								
179	Bayview	Road	Colchester0008.pdf								
191	Bayview	Road	Colchester0009.pdf								
206	Bayview	Road	Colchester0010.pdf								
209	Bayview	Road	Colchester0011.pdf								
8	Beach	Road	Colchester0000.pdf		N	N	N	N	—	4/22/16	
40	Beach	Road	Colchester0000.pdf								
56	Beach	Road	Colchester0000.pdf								
101	Beach	Road	Colchester0000.pdf								
120	Beach	Road	Colchester0001.pdf								
139	Beach	Road	Colchester0002.pdf								
153	Beach	Road	Colchester0000.pdf								
168	Beach	Road	Colchester0004.pdf								
169	Beach	Road	Colchester0000.pdf								
29	Bean	Road	Colchester0000.pdf		N	N	N	N	—	4/22/16	
31	Bean	Road	Colchester0001.pdf								
46	Bean	Road	Colchester0002.pdf								
62	Bean	Road	Colchester0003.pdf								
134	Bean	Road	Colchester0004.pdf								
178	Bean	Road	Colchester0006.pdf								
198	Bean	Road	Colchester0000.pdf								
208	Bean	Road	Colchester0008.pdf								
225	Bean	Road	Colchester0009.pdf								
230	Bean	Road	Colchester0010.pdf								
252	Bean	Road	Colchester0011.pdf								
268	Bean	Road	Colchester0012.pdf								
294	Bean	Road	Colchester0013.pdf								
355	Bean	Road	Colchester0014.pdf								
372	Bean	Road	Colchester0015.pdf								
404	Bean	Road	Colchester0016.pdf								
405	Bean	Road	Colchester0017.pdf								
408	Bean	Road	Colchester00170000.pdf								
433	Bean	Road	Colchester0018.pdf								
448	Bean	Road	Colchester00190000.pdf								
451	Bean	Road	Colchester0000.pdf								
453	Bean	Road	Colchester0000.pdf								
471	Bean	Road	Colchester0021.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
498	Bean	Road	Colchester0022.pdf	1501-Arrool	N	N	N	N	—	9/22/16	Premier
509	Bean	Road	Colchester0000.pdf								
53	Bean	Road	Colchester0000.pdf								
538	Bean	Road	Colchester0023.pdf								
543	Bean	Road	Colchester0000.pdf								
583	Bean	Road	Colchester0024.pdf								
609	Bean	Road	Colchester0025.pdf								
616	Bean	Road	Colchester0026.pdf								
642	Bean	Road	Colchester0027.pdf								
652	Bean	Road	Colchester0028.pdf								
667	Bean	Road	Colchester0029.pdf								
668	Bean	Road	Colchester0030.pdf								
679	Bean	Road	Colchester0031.pdf								
762	Bean	Road	Colchester0000.pdf								
763	Bean	Road	Colchester0000.pdf								
770	Bean	Road	Colchester0000.pdf								
772	Bean	Road	Colchester0000.pdf								
45	Belair	Drive	Colchester0000.pdf		N	N	N	N	—	9/22/16	
67	Belair	Drive	Colchester0001.pdf								
93	Belair	Drive	Colchester0002.pdf								
150	Belair	Drive	Colchester0003.pdf								
169	Belair	Drive	Colchester0004.pdf								
172	Belair	Drive	Colchester0005.pdf								
194	Belair	Drive	Colchester0006.pdf								
197	Belair	Drive	Colchester0007.pdf								
214	Belair	Drive	Colchester0008.pdf								
219	Belair	Drive	Colchester0009.pdf								
245	Belair	Drive	Colchester0010.pdf								
262	Belair	Drive	Colchester0011.pdf								
267	Belair	Drive	Colchester0012.pdf								
276	Belair	Drive	Colchester0013.pdf								
318	Belair	Drive	Colchester0014.pdf								
330	Belair	Drive	Colchester0015.pdf								
331	Belair	Drive	Colchester0016.pdf								
352	Belair	Drive	Colchester0017.pdf								
366	Belair	Drive	Colchester0018.pdf								
374	Belair	Drive	Colchester0018.pdf								
381	Belair	Drive	Colchester0019.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
392	Belair	Drive	Colchester0020.pdf	1501-472006	N	N	N	N	—	9/21/16	Premier
409	Belair	Drive	Colchester0021.pdf								
412	Belair	Drive	Colchester0022.pdf								
434	Belair	Drive	Colchester0023.pdf								
435	Belair	Drive	Colchester0000.pdf								
452	Belair	Drive	Colchester0024.pdf								
457	Belair	Drive	Colchester0025.pdf								
478	Belair	Drive	Colchester0026.pdf								
481	Belair	Drive	Colchester0027.pdf								
494	Belair	Drive	Colchester0028.pdf								
503	Belair	Drive	Colchester0029.pdf								
520	Belair	Drive	Colchester0030.pdf								
531	Belair	Drive	Colchester0031.pdf								
538	Belair	Drive	Colchester0032.pdf								
568	Belair	Drive	Colchester0033.pdf		↓	↓	↓	↓	↓	↓	
39	Belwood	Avenue	Colchester0000.pdf		N	N	N	N	—	9/21/16	
41	Belwood	Avenue	Colchester0000.pdf								
42	Belwood	Avenue	Colchester0001.pdf								
64	Belwood	Avenue	Colchester0002.pdf								
81	Belwood	Avenue	Colchester0003.pdf								
90	Belwood	Avenue	Colchester0004.pdf								
107	Belwood	Avenue	Colchester0005.pdf								
145	Belwood	Avenue	Colchester0006.pdf								
191	Belwood	Avenue	Colchester0000.pdf								
203	Belwood	Avenue	Colchester0008.pdf								
223	Belwood	Avenue	Colchester0000.pdf								
246	Belwood	Avenue	Colchester0009.pdf								
247	Belwood	Avenue	Colchester0009.pdf								
267	Belwood	Avenue	Colchester0010.pdf								
281	Belwood	Avenue	Colchester0011.pdf								
283	Belwood	Avenue	Colchester0012.pdf								
298	Belwood	Avenue	Colchester0013.pdf								
353	Belwood	Avenue	Colchester0000.pdf								
358	Belwood	Avenue	Colchester0000.pdf								
367	Belwood	Avenue	Colchester0014.pdf		↓	↓	↓	↓	↓	↓	
11	Billado	Court	Colchester0000.pdf		N	N	N	N	—	9/21/16	
18	Birch	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
19	Birch	Drive	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓

NM.

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
18	Birchwood	Drive	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
62	Birchwood	Drive	Colchester0000.pdf								
71	Birchwood	Drive	Colchester0000.pdf								
80	Birchwood	Drive	Colchester0001.pdf								
94	Birchwood	Drive	Colchester0002.pdf								
101	Birchwood	Drive	Colchester0003.pdf								
112	Birchwood	Drive	Colchester0004.pdf								
114	Birchwood	Drive	Colchester0005.pdf								
125	Birchwood	Drive	Colchester0006.pdf								
140	Birchwood	Drive	Colchester0007.pdf								
145	Birchwood	Drive	Colchester0008.pdf								
160	Birchwood	Drive	Colchester0009.pdf								
169	Birchwood	Drive	Colchester.pdf								
180	Birchwood	Drive	Colchester0010.pdf								
187	Birchwood	Drive	Colchester0011.pdf								
196	Birchwood	Drive	Colchester0012.pdf								
235	Birchwood	Drive	Colchester0013.pdf								
240	Birchwood	Drive	Colchester0014.pdf								
242	Birchwood	Drive	Colchester0015.pdf								
292	Birchwood	Drive	Colchester0016.pdf								
311	Birchwood	Drive	Colchester0017.pdf								
313	Birchwood	Drive	Colchester0018.pdf								
314	Birchwood	Drive	Colchester0019.pdf								
336	Birchwood	Drive	Colchester0020.pdf								
339	Birchwood	Drive	Colchester0021.pdf								
365	Birchwood	Drive	Colchester0000.pdf								
374	Birchwood	Drive	Colchester0022.pdf								
391	Birchwood	Drive	Colchester0000.pdf								
418	Birchwood	Drive	Colchester0023.pdf								
19	Biscayne	Heights	Colchester0000.pdf		N	N	N	N	—	9/19/16	
45	Biscayne	Heights	Colchester0000.pdf								
52	Biscayne	Heights	Colchester0001.pdf								
67	Biscayne	Heights	Colchester0002.pdf								
87	Biscayne	Heights	Colchester0000.pdf								
108	Biscayne	Heights	Colchester0003.pdf								
113	Biscayne	Heights	Colchester0004.pdf								
135	Biscayne	Heights	Colchester0005.pdf								
142	Biscayne	Heights	Colchester0006.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
159	Biscayne	Heights	Colchester0007.pdf	1501-A22006	N	N	N	N	—	9/9/16	Premier
170	Biscayne	Heights	Colchester0008.pdf								
194	Biscayne	Heights	Colchester0009.pdf								
216	Biscayne	Heights	Colchester0010.pdf								
227	Biscayne	Heights	Colchester0011.pdf								
240	Biscayne	Heights	Colchester0000.pdf								
243	Biscayne	Heights	Colchester0012.pdf								
267	Biscayne	Heights	Colchester0013.pdf								
278	Biscayne	Heights	Colchester0014.pdf								
294	Biscayne	Heights	Colchester0015.pdf								
299	Biscayne	Heights	Colchester0016.pdf								
316	Biscayne	Heights	Colchester0017.pdf								
323	Biscayne	Heights	Colchester0018.pdf								
348	Biscayne	Heights	Colchester0019.pdf								
22	Bissette	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
118	Bissette	Drive	Colchester0002.pdf								
140	Bissette	Drive	Colchester0003.pdf								
157	Bissette	Drive	Colchester0004.pdf								
158	Bissette	Drive	Colchester0005.pdf								
174	Bissette	Drive	Colchester0006.pdf								
177	Bissette	Drive	Colchester0007.pdf								
197	Bissette	Drive	Colchester0008.pdf								
202	Bissette	Drive	Colchester0009.pdf								
221	Bissette	Drive	Colchester0010.pdf								
226	Bissette	Drive	Colchester0011.pdf								
241	Bissette	Drive	Colchester0012.pdf								
261	Bissette	Drive	Colchester0013.pdf								
266	Bissette	Drive	Colchester0014.pdf								
283	Bissette	Drive	Colchester0015.pdf								
284	Bissette	Drive	Colchester0016.pdf								
306	Bissette	Drive	Colchester0017.pdf								
307	Bissette	Drive	Colchester0018.pdf								
318	Bissette	Drive	Colchester0019.pdf								
20	Blackberry	Circle	Colchester0001.pdf		N	N	N	N	—	9/22/16	
47	Blackberry	Circle	Colchester0002.pdf						—		
50	Blackberry	Circle	Colchester0003.pdf						—		
70	Blackberry	Circle	Colchester0004.pdf						—		
84	Blackberry	Circle	Colchester0005.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
87	Blackberry	Circle	Colchester0006.pdf	1501-422006	N	N	N	N	—	9/26/16	Premier
102	Blackberry	Circle	Colchester0007.pdf								
113	Blackberry	Circle	Colchester0008.pdf								
118	Blackberry	Circle	Colchester0009.pdf								
123	Blackberry	Circle	Colchester0010.pdf								
142	Blackberry	Circle	Colchester0011.pdf								
182	Blackberry	Circle	Colchester0014.pdf								
212	Blackberry	Circle	Colchester0015.pdf								
219	Blackberry	Circle	Colchester0016.pdf								
231	Blackberry	Circle	Colchester0017.pdf								
236	Blackberry	Circle	Colchester0018.pdf								
36	Blakely	Road	Colchester0000.pdf		N	N	N	N	—	9/27/16	
78	Blakely	Road	Colchester0001.pdf								
0133A	Blakely	Road	Colchester0002.pdf								
0133B	Blakely	Road	Colchester0003.pdf								
157	Blakely	Road	Colchester0004.pdf								
205	Blakely	Road	Colchester0005.pdf								
0243A	Blakely	Road	Colchester0006.pdf								
0243B	Blakely	Road	Colchester0007.pdf								
303	Blakely	Road	Colchester0008.pdf								
308	Blakely	Road	Colchester0009.pdf								
331	Blakely	Road	Colchester0000.pdf								
386	Blakely	Road	Colchester0000.pdf								
425	Blakely	Road	Colchester0011.pdf								
0609A	Blakely	Road	Colchester0012.pdf								
0609B	Blakely	Road	Colchester0013.pdf								
630	Blakely	Road	Colchester0000.pdf								
656	Blakely	Road	Colchester0015.pdf								
674	Blakely	Road	Colchester0014.pdf								
687	Blakely	Road	Colchester0016.pdf								
704	Blakely	Road	Colchester0017.pdf								
711	Blakely	Road	Colchester0018.pdf								
732	Blakely	Road	Colchester0019.pdf								
744	Blakely	Road	Colchester0020.pdf								
781	Blakely	Road	Colchester0021.pdf								
830	Blakely	Road	Colchester0023.pdf								
835	Blakely	Road	Colchester0000.pdf								
883	Blakely	Road	Colchester0026.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
903	Blakely	Road	Colchester0027.pdf	1501-442006	N	N	N	N	—	4/27/16	Premier
925	Blakely	Road	Colchester0028.pdf								
983	Blakely	Road	Colchester0029.pdf								
1018	Blakely	Road	Colchester0030.pdf								
1026	Blakely	Road	Colchester0000.pdf								
1027	Blakely	Road	Colchester0033.pdf								
1029	Blakely	Road	Colchester0034.pdf								
1270	Blakely	Road	Colchester0000.pdf								
1686	Blakely	Road	Colchester0035.pdf								
1700	Blakely	Road	Colchester0036.pdf								
1732	Blakely	Road	Colchester0037.pdf								
1749	Blakely	Road	Colchester0038.pdf								
1758	Blakely	Road	Colchester0039.pdf								
1783	Blakely	Road	Colchester0040.pdf								
1912	Blakely	Road	Colchester0041.pdf								
1951	Blakely	Road	Colchester0042.pdf								
1963	Blakely	Road	Colchester0043.pdf								
1987	Blakely	Road	Colchester0044.pdf								
2025	Blakely	Road	Colchester0000.pdf								
2030	Blakely	Road	Colchester0045.pdf								
2061	Blakely	Road	Colchester0046.pdf								
2079	Blakely	Road	Colchester0000.pdf								
2100	Blakely	Road	Colchester0047.pdf								
2115	Blakely	Road	Colchester0048.pdf								
2163	Blakely	Road	Colchester0049.pdf								
2219	Blakely	Road	Colchester0000.pdf								
2269	Blakely	Road	Colchester0000.pdf								
2407	Blakely	Road	Colchester0051.pdf								
15	Bloomfield	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
20	Bloomfield	Drive	Colchester0001.pdf						—		
34	Bloomfield	Drive	Colchester0002.pdf						—		
62	Bloomfield	Drive	Colchester0003.pdf						—		
70	Bloomfield	Drive	Colchester0004.pdf						—		
7	Bluebird	Drive	Colchester0000.pdf		N	N	N	N	—	4/21/16	
23	Bluebird	Drive	Colchester0001.pdf						—		
39	Bluebird	Drive	Colchester0002.pdf						—		
46	Bluebird	Drive	Colchester0000.pdf						—		
63	Bluebird	Drive	Colchester0000.pdf						—		

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
68	Bluebird	Drive	Colchester0000.pdf	1501422006	N	N	N	N	—	9/21/16	Premier
86	Bluebird	Drive	Colchester0000.pdf								
106	Bluebird	Drive	Colchester0003.pdf								
12	Bluebird	Drive	Colchester0000.pdf								
122	Bluebird	Drive	ColchesteR0000.pdf								
137	Bluebird	Drive	Colchester0004.pdf								
140	Bluebird	Drive	Colchester0000.pdf								
162	Bluebird	Drive	Colchester0005.pdf								
164	Bluebird	Drive	Colchester0006.pdf								
167	Bluebird	Drive	Colchester0007.pdf								
222	Bluebird	Drive	Colchester0008.pdf								
225	Bluebird	Drive	Colchester0009.pdf								
240	Bluebird	Drive	Colchester0010.pdf								
245	Bluebird	Drive	Colchester0000.pdf								
262	Bluebird	Drive	Colchester0011.pdf								
271	Bluebird	Drive	Colchester0012.pdf								
278	Bluebird	Drive	Colchester0013.pdf								
291	Bluebird	Drive	Colchester0014.pdf								
296	Bluebird	Drive	Colchester0015.pdf								
314	Bluebird	Drive	Colchester0016.pdf								
332	Bluebird	Drive	Colchester0017.pdf								
6	Bluff	Road	Colchester0000.pdf		N	N	N	N	—	9/19/16	
24	Bluff	Road	Colchester0000.pdf								
36	Bluff	Road	Colchester0000.pdf								
37	Bluff	Road	Colchester0000.pdf								
47	Bluff	Road	Colchester0000.pdf								
61	Bluff	Road	Colchester0000.pdf								
28	Bonanza	Park	Colchester0000.pdf		N	N	N	N	—	9/21/16	
37	Bonanza	Park	Colchester0000.pdf								
46	Bonanza	Park	Colchester0001.pdf								
55	Bonanza	Park	Colchester0002.pdf								
64	Bonanza	Park	Colchester0000.pdf								
75	Bonanza	Park	Colchester0003.pdf								
84	Bonanza	Park	Colchester0004.pdf								
094A	Bonanza	Park	Colchester0005.pdf								
094B	Bonanza	Park	Colchester0000.pdf								
105	Bonanza	Park	Colchester0006.pdf								
142	Bonanza	Park	Colchester0007.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
170	Bonanza	Park	Colchester0008.pdf	1501-422006	N	N	N	N	—	9/24/16	Premier
190	Bonanza	Park	Colchester0009.pdf								
193	Bonanza	Park	Colchester0010.pdf								
208	Bonanza	Park	Colchester0011.pdf								
213	Bonanza	Park	Colchester0012.pdf								
238	Bonanza	Park	Colchester0013.pdf								
244	Bonanza	Park	Colchester0014.pdf								
300	Bonanza	Park	Colchester0015.pdf								
306	Bonanza	Park	Colchester0000.pdf								
322	Bonanza	Park	Colchester0016.pdf								
338	Bonanza	Park	Colchester0017.pdf								
356	Bonanza	Park	Colchester0018.pdf								
376	Bonanza	Park	Colchester0000.pdf								
392	Bonanza	Park	Colchester0019.pdf								
395	Bonanza	Park	Colchester0020.pdf								
410	Bonanza	Park	Colchester0000.pdf								
419	Bonanza	Park	Colchester0021.pdf								
426	Bonanza	Park	Colchester0000.pdf								
444	Bonanza	Park	Colchester0022.pdf								
466	Bonanza	Park	Colchester0001.pdf								
476	Bonanza	Park	Colchester0000.pdf								
480	Bonanza	Park	Colchester0000.pdf								
496	Bonanza	Park	Colchester0024.pdf								
529	Bonanza	Park	Colchester0025.pdf								
540	Bonanza	Park	Colchester0002.pdf								
63	Brentwood	Park	Colchester0000.pdf		N	N	N	N	—	5/24/16	
146	Brentwood	Park	Colchester0001.pdf								
154	Brentwood	Park	Colchester0002.pdf								
156	Brentwood	Park	Colchester0003.pdf								
158	Brentwood	Park	Colchester0004.pdf								
254	Brentwood	Drive	Colchester0000.pdf								
11	Briar	Lane	Colchester0000.pdf		N	N	N	N	—	9/17/16	
14-20	Briar	Lane	Colchester0000.pdf								
28-30	Briar	Lane	Colchester0000.pdf								
34-36-44	Briar	Lane	Colchester0000.pdf								
133A	Broadacres	Drive	Colchester0001.pdf		N	N	N	N	—	9/22/16	
133B	Broadacres	Drive	Colchester0002.pdf		N	N	N	N	—		
64	Broadlake	Road	Colchester0000.pdf		N	N	N	N	—	9/19/16	

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
67	Broadlake	Road	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/14/16	Premier
90	Broadlake	Road	Colchester0000.pdf								
111	Broadlake	Road	Colchester0000.pdf								
118	Broadlake	Road	Colchester0001.pdf								
119	Broadlake	Road	Colchester0002.pdf								
131	Broadlake	Road	Colchester0003.pdf								
134	Broadlake	Road	Colchester0004.pdf								
141	Broadlake	Road	Colchester0005.pdf								
150	Broadlake	Road	Colchester0000.pdf								
151	Broadlake	Road	Colchester0000.pdf								
160	Broadlake	Road	Colchester0006.pdf								
161	Broadlake	Road	Colchester0000.pdf								
172	Broadlake	Road	Colchester0007.pdf								
187	Broadlake	Road	Colchester0008.pdf								
188	Broadlake	Road	Colchester0009.pdf								
203	Broadlake	Road	Colchester0010.pdf								
215	Broadlake	Road	Colchester0011.pdf								
225	Broadlake	Road	Colchester0012.pdf								
228	Broadlake	Road	Colchester0013.pdf								
248	Broadlake	Road	Colchester0014.pdf								
262	Broadlake	Road	Colchester0015.pdf								
290	Broadlake	Road	Colchester0016.pdf								
310A	Broadlake	Road	Colchester0017.pdf								
310B	Broadlake	Road	Colchester0018.pdf								
330	Broadlake	Road	Colchester0019.pdf								
346	Broadlake	Road	Colchester0020.pdf								
372	Broadlake	Road	Colchester0000.pdf								
385	Broadlake	Road	Colchester0022.pdf								
388	Broadlake	Road	Colchester0023.pdf								
405	Broadlake	Road	Colchester0024.pdf								
412	Broadlake	Road	Colchester0025.pdf								
426	Broadlake	Road	Colchester0026.pdf								
446	Broadlake	Road	Colchester0027.pdf								
451	Broadlake	Road	Colchester0028.pdf								
457	Broadlake	Road	Colchester0000.pdf								
34	Buckingham	Dirve	Colchester0000.pdf		N	N	N	N	—	9/15/16	
66	Buckingham	Dirve	Colchester0001.pdf						—		
94	Buckingham	Dirve	Colchester0002.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
105	Buckingham	Dirve	Colchester0003.pdf	1501-422006	N	N	N	N	—	9/19/16	Premier
118	Buckingham	Dirve	Colchester0004.pdf								
121	Buckingham	Dirve	Colchester0005.pdf								
137	Buckingham	Dirve	Colchester0006.pdf								
152	Buckingham	Dirve	Colchester0007.pdf								
170	Buckingham	Dirve	Colchester0008.pdf								
172	Buckingham	Dirve	Colchester0009.pdf								
176	Buckingham	Dirve	Colchester0010.pdf								
187	Buckingham	Dirve	Colchester0011.pdf								
192	Buckingham	Dirve	Colchester0012.pdf								
212	Buckingham	Dirve	Colchester0013.pdf								
217	Buckingham	Dirve	Colchester0014.pdf								
230	Buckingham	Dirve	Colchester0015.pdf								
250	Buckingham	Dirve	Colchester0016.pdf								
268	Buckingham	Dirve	Colchester0017.pdf								
288	Buckingham	Dirve	Colchester0018.pdf								
293	Buckingham	Dirve	Colchester0019.pdf								
323	Buckingham	Dirve	Colchester0000.pdf								
344	Buckingham	Dirve	Colchester0020.pdf								
350	Buckingham	Dirve	Colchester0000.pdf								
19	Burnham	Lane	Colchester0000.pdf		N	N	N	N	—	9/24/16	
47	Burnham	Lane	Colchester0001.pdf								
56	Burnham	Lane	Colchester0002.pdf								
73	Burnham	Lane	Colchester0003.pdf								
80	Burnham	Lane	Colchester0004.pdf								
99	Burnham	Lane	Colchester0005.pdf								
119	Burnham	Lane	Colchester0006.pdf								
124	Burnham	Lane	Colchester0007.pdf								
139	Burnham	Lane	Colchester0008.pdf								
153	Burnham	Lane	Colchester0009.pdf								
170	Burnham	Lane	Colchester0010.pdf								
191	Burnham	Lane	Colchester0011.pdf								
196	Burnham	Lane	Colchester0012.pdf								
12	Caleb	Court	Colchester0000.pdf		N	N	N	N	—	9/21/16	
50	Caleb	Court	Colchester0000.pdf		N	N	N	N	—		
	Camp Johnson	Road	Colchester0000.pdf		N	N	N	N	—	9/29/16	
20	Campus	Road	Colchester0000.pdf		N	N	N	N	—		
22	Campus	Road	Colchester0001.pdf		N	N	N	N	—		

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
132	Campus	Road	Colchester0002.pdf	1501-472006	N	N	N	N	–	9/29/16	Premius
392	Campus	Road	Colchester0004.pdf								
460	Campus	Road	Colchester0000.pdf								
472	Campus	Road	Colchester0000.pdf								
486	Campus	Road	Colchester0000.pdf								
700	Campus	Road	Colchester0007.pdf								
110	Cantonment	Circle	Colchester.pdf		~~N~~	~~N~~	~~N~~	~~N~~		[illegible]	350
8	Canyon Estate	Dirve	Colchester0000.pdf		N	N	N	N	–		
9	Canyon Estate	Dirve	Colchester0000.pdf								
30	Canyon Estate	Dirve	Colchester0001.pdf								
31	Canyon Estate	Dirve	Colchester0002.pdf								
49	Canyon Estate	Dirve	Colchester0003.pdf								
50	Canyon Estate	Dirve	Colchester0004.pdf								
74	Canyon Estate	Dirve	Colchester0005.pdf								
81	Canyon Estate	Dirve	Colchester0000.pdf								
97	Canyon Estate	Dirve	Colchester0006.pdf								
125	Canyon Estate	Dirve	Colchester0007.pdf								
13	Canyon	Road	Colchester0001.pdf		N	N	N	N	–		
24	Canyon	Road	Colchester0002.pdf								
49	Canyon	Road	Colchester0003.pdf								
57	Canyon	Road	Colchester0004.pdf								
84	Canyon	Road	Colchester0005.pdf								
85	Canyon	Road	Colchester0006.pdf								
123	Canyon	Road	Colchester0007.pdf								
144	Canyon	Road	Colchester0008.pdf								
158	Canyon	Road	Colchester0009.pdf								
170	Canyon	Road	Colchester0010.pdf								
192	Canyon	Road	Colchester0012.pdf								
212	Canyon	Road	Colchester0013.pdf								
226	Canyon	Road	Colchester0000.pdf								
228	Canyon	Road	Colchester0014.pdf								
251	Canyon	Road	Colchester0000.pdf								
349	Canyon	Road	Colchester0000.pdf								
32	Carriage	Way	Colchester0000.pdf		N	N	N	N	–	9/28/16	
34	Carriage	Way	Colchester0001.pdf								
61	Carriage	Way	Colchester0002.pdf								
63	Carriage	Way	Colchester0003.pdf								
45	Casey	Lane	Colchester0000.pdf		N	N	N	N	–	9/30/16	

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Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
60	Casey	Lane	Colchester0000.pdf	1501422006	N	N	N	N	—	9/20/16	Premier
65	Casey	Lane	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
98	Casey	Lane	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
105	Casey	Lane	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
118	Casey	Lane	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
136	Casey	Lane	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
139	Casey	Lane	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
154	Casey	Lane	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
24	Cashman	Road	Colchester0006.pdf	↓	N	N	N	N	—	9/29/16	↓
62	Cashman	Road	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
62	Cashman	Road	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
134	Cashman	Road	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
17	Catamount	Lane	Colchester0000.pdf	↓	N	N	N	N	—	9/29/16	↓
24	Catamount	Lane	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
33	Catamount	Lane	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
36A	Catamount	Lane	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
36B	Catamount	Lane	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
38	Catamount	Lane	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
27	Causway	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/19/16	↓
28	Causway	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
45	Causway	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
63	Causway	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
71	Causway	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
87	Causway	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
3	Cedar Creek	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/21/16	↓
23	Cedar Creek	Road	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
45	Cedar Creek	Road	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
50	Cedar Creek	Road	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
57	Cedar Creek	Road	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
58	Cedar Creek	Road	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
243 ✓	Cedar Ridge	Drive	Colchester00000000.pdf	↓	N	N	N	N	N	9/22/16	↓
25	Cedar Ridge	Drive	Colchester.pdf	↓	↓	↓	↓	↓	↓	↓	↓
274 ✓	Cedar Ridge	Drive	Colchester00000001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
280 ✓	Cedar Ridge	Drive	Colchester00000002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
30	Champlain	Drive	Colchester0000.pdf	↓	N	N	N	N	—	9/28/16	↓
67	Champlain	Drive	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
38	Chase	Lane	Colchester00000000.pdf	↓	N	N	N	N	—	9/20/16	↓
12	Chestnut	Lane	Colchester0001.pdf	↓	N	N	N	N	—	9/26/16	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
26	Chestnut	Lane	Colchester0002.pdf	1501-422006	N	N	N	—	—	9/26/16	Premier
31	Chestnut	Lane	Colchester0004.pdf								
47	Chestnut	Lane	Colchester0006.pdf								
48	Chestnut	Lane	Colchester0002.pdf								
48	Chestnut	Lane	Colchester0003.pdf								
48	Chestnut	Lane	Colchester0004.pdf								
48	Chestnut	Lane	Colchester0008.pdf								
48	Chestnut	Lane	Colchester0000.pdf								
48	Chestnut	Lane	Colchester0001.pdf								
51	Chestnut	Lane	Colchester0009.pdf								
52	Chestnut	Lane	Colchester0011.pdf								
52	Chestnut	Lane	Colchester0000.pdf								
52	Chestnut	Lane	Colchester0001.pdf								
52	Chestnut	Lane	Colchester0002.pdf								
52	Chestnut	Lane	Colchester0003.pdf								
52	Chestnut	Lane	Colchester0004.pdf								
50	Church	Road	Colchester0000.pdf		N	N	N	N	—	9/26/16	
72	Church	Road	Colchester0001.pdf								
98	Church	Road	Colchester0002.pdf								
116	Church	Road	Colchester0000.pdf								
150	Church	Road	Colchester0000.pdf								
153	Church	Road	Colchester0000.pdf								
173-175	Church	Road	Colchester0000.pdf								
237	Church	Road	Colchester0004.pdf								
252	Church	Road	Colchester0005.pdf								
263	Church	Road	Colchester0006.pdf								
280	Church	Road	Colchester0000.pdf								
282	Church	Road	Colchester0000.pdf								
294	Church	Road	Colchester0009.pdf								
297	Church	Road	Colchester0000.pdf								
308	Church	Road	Colchester0000.pdf								
335	Church	Road	Colchester0000.pdf								
342	Church	Road	Colchester0011.pdf								
351	Church	Road	Colchester0012.pdf								
360	Church	Road	Colchester0013.pdf								
375	Church	Road	Colchester0014.pdf								
393	Church	Road	Colchester0015.pdf								
416A	Church	Road	Colchester0016.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
416B	Church	Road	Colchester0017.pdf	1501-422006	N	N	N	N	—	5/2/16	Premier
416C	Church	Road	Colchester0018.pdf								
431	Church	Road	Colchester00190000.pdf								
438	Church	Road	Colchester0020.pdf								
453	Church	Road	Colchester0021.pdf								
468	Church	Road	Colchester0022.pdf								
471	Church	Road	Colchester0023.pdf								
494	Church	Road	Colchester0024.pdf								
521	Church	Road	Colchester0000.pdf								
524	Church	Road	Colchester0000.pdf								
535	Church	Road	Colchester0025.pdf								
548	Church	Road	Colchester0002.pdf								
553	Church	Road	Colchester0026.pdf								
554	Church	Road	Colchester0001.pdf								
558	Church	Road	Colchester0000.pdf								
580	Church	Road	Colchester00300000.pdf								
581	Church	Road	Colchester0032.pdf								
582	Church	Road	Colchester00310000.pdf								
593	Church	Road	Colchester0033.pdf								
606	Church	Road	Colchester0000.pdf								
626	Church	Road	Colchester00340000.pdf								
629	Church	Road	Colchester0035.pdf								
644	Church	Road	Colchester0036.pdf								
655	Church	Road	Colchester0037.pdf								
673	Church	Road	Colchester0038.pdf								
678	Church	Road	Colchester0039.pdf								
707	Church	Road	Colchester0000.pdf								
709	Church	Road	Colchester0001.pdf								
716	Church	Road	Colchester0040.pdf								
739	Church	Road	Colchester0002.pdf								
756	Church	Road	Colchester0000.pdf								
778	Church	Road	Colchester0000.pdf								
785	Church	Road	Colchester0041.pdf								
798	Church	Road	Colchester0000.pdf								
807	Church	Road	Colchester0000.pdf								
821	Church	Road	Colchester0043.pdf								
838	Church	Road	Colchester0044.pdf								
844	Church	Road	Colchester0045.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
849	Church	Road	Colchester0046.pdf	1501-A22006	N	N	N	N	—	9/21/16	Premier
872	Church	Road	Colchester0000.pdf		N	N	N	N	—	↓	
73	Cobbleview	Drive	Colchester0000.pdf		N	N	N	N	—	9/27/16	
74	Cobbleview	Drive	Colchester0001.pdf								
92	Cobbleview	Drive	Colchester0002.pdf								
103	Cobbleview	Drive	Colchester0003.pdf								
116	Cobbleview	Drive	Colchester0006.pdf								
119	Cobbleview	Drive	Colchester0000.pdf								
132	Cobbleview	Drive	Colchester0004.pdf								
154	Cobbleview	Drive	Colchester0000.pdf								
159	Cobbleview	Drive	Colchester0007.pdf								
174	Cobbleview	Drive	Colchester0008.pdf								
188	Cobbleview	Drive	Colchester0009.pdf								
207	Cobbleview	Drive	Colchester0000.pdf								
208	Cobbleview	Drive	Colchester.pdf								
226	Cobbleview	Drive	Colchester0010.pdf								
244	Cobbleview	Drive	Colchester0011.pdf								
259	Cobbleview	Drive	Colchester0012.pdf								
274	Cobbleview	Drive	Colchester0013.pdf								
38	Colchester Point	Road	Colchester0000.pdf		N	N	N	N	—	9/19/16	
60	Colchester Point	Road	Colchester0001.pdf								
75	Colchester Point	Road	Colchester0002.pdf								
77	Colchester Point	Road	Colchester0003.pdf								
118	Colchester Point	Road	Colchester0004.pdf								
132	Colchester Point	Road	Colchester0000.pdf								
184	Colchester Point	Road	Colchester0005.pdf								
188	Colchester Point	Road	Colchester0006.pdf								
301	Colchester Point	Road	Colchester0000.pdf								
645	Colchester Point	Road	Colchester0000.pdf								
645	Colchester Point	Road	Colchester0000.pdf								
839	Colchester Point	Road	Colchester0008.pdf								
859	Colchester Point	Road	Colchester0000.pdf								
1051	Colchester Point	Road	Colchester0009.pdf								
1095	Colchester Point	Road	Colchester0000.pdf								
1119	Colchester Point	Road	Colchester0000.pdf								
1345	Colchester Point	Road	Colchester0000.pdf								
1385	Colchester Point	Road	Colchester0000.pdf								
1423	Colchester Point	Road	Colchester0000.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
1443	Colchester Point	Road	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/19/16	Premier
1471	Colchester Point	Road	Colchester0000.pdf						—		
1486	Colchester Point	Road	Colchester0000.pdf	—					—	—	
12	College	Parkway	Colchester0001.pdf		N	N	N	N	—	9/29/16	
26	College	Parkway	Colchester0002.pdf								
44	College	Parkway	Colchester0004.pdf								
51	College	Parkway	Colchester0005.pdf								
66	College	Parkway	Colchester0006.pdf								
96	College	Parkway	Colchester0008.pdf								
106	College	Parkway	Colchester0009.pdf								
124	College	Parkway	Colchester0010.pdf								
127	College	Parkway	Colchester0013.pdf								
172	College	Parkway	Colchester0014.pdf								
186	College	Parkway	Colchester	RETIRED.pdf							
204	College	Parkway	Colchester0016.pdf								
230	College	Parkway	Colchester0000.pdf								
424	College	Parkway	Colchester0001.pdf								
426	College	Parkway	Colchester0028.pdf								
581	College	Parkway	Colchester0029.pdf								
609	College	Parkway	Colchester0030.pdf								
633	College	Parkway	Colchester0031.pdf								
639	College	Parkway	Colchester0032.pdf								
653	College	Parkway	Colchester0000.pdf								
747	College	Parkway	Colchester0035.pdf								
781	College	Parkway	Colchester0000.pdf								
790A	College	Parkway	Colchester0038.pdf								
790B	College	Parkway	Colchester0039.pdf								
790C	College	Parkway	Colchester0040.pdf								
790D	College	Parkway	Colchester0041.pdf								
790E	College	Parkway	Colchester0042.pdf								
790F	College	Parkway	Colchester0043.pdf								
792	College	Parkway	Colchester0044.pdf								
802A	College	Parkway	Colchester0045.pdf								
802B	College	Parkway	Colchester0046.pdf								
802C	College	Parkway	Colchester0047.pdf								
807	College	Parkway	Colchester0000.pdf								
831	College	Parkway	Colchester0049.pdf								
851	College	Parkway	Colchester0051.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
865-883	College	Parkway	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/29/16	Premier
109-11	Colonial	Drive	Colchester0001.pdf		N	N	N	N	—	9/28/16	
110-112	Colonial	Drive	Colchester0000.pdf								
202	Colonial	Drive	Colchester0002.pdf								
214	Colonial	Drive	Colchester0003.pdf								
225	Colonial	Drive	Colchester0004.pdf								
238	Colonial	Drive	Colchester0005.pdf								
249	Colonial	Drive	Colchester0006.pdf								
263	Colonial	Drive	Colchester0007.pdf								
278	Colonial	Drive	Colchester0008.pdf								
289	Colonial	Drive	Colchester0009.pdf								
309	Colonial	Drive	Colchester0010.pdf								
327	Colonial	Drive	Colchester0011.pdf								
334	Colonial	Drive	Colchester0000.pdf								
349	Colonial	Drive	Colchester0012.pdf								
354	Colonial	Drive	Colchester0000.pdf								
372	Colonial	Drive	Colchester0013.pdf								
379	Colonial	Drive	Colchester0014.pdf								
415	Colonial	Drive	Colchester0015.pdf								
421	Colonial	Drive	Colchester0016.pdf								
430	Colonial	Drive	Colchester0017.pdf								
435	Colonial	Drive	Colchester0018.pdf								
448	Colonial	Drive	Colchester0019.pdf								
461	Colonial	Drive	Colchester0020.pdf								
470	Colonial	Drive	Colchester0021.pdf								
473	Colonial	Drive	Colchester0022.pdf								
484	Colonial	Drive	Colchester0023.pdf								
495	Colonial	Drive	Colchester0024.pdf								
502	Colonial	Drive	Colchester0025.pdf								
505	Colonial	Drive	Colchester0000.pdf								
537	Colonial	Drive	Colchester0026.pdf								
576	Colonial	Drive	Colchester0000.pdf								
	Commerce	Park	Colchester0000.pdf		N	N	N	N	—	9/29/16	
47	Commerce	Street	Colchester0000.pdf						—		
44A	Commonwelath		Colchester0000.pdf		N	N	N	N	—	9/20/16	
44B	Commonwelath		Colchester0001.pdf						—		
44C	Commonwelath		Colchester0002.pdf						—		
45A	Commonwelath		Colchester0003.pdf						—		

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
45B	Commonwelath		Colchester0004.pdf	1501-442006	N	N	N	N	—	9/20/16	Premiel
45C	Commonwelath		Colchester0005.pdf		N	N	N	N	—		
	Field Green	Drive	Colchester0005.pdf		N	N	N	N	—	9/26/16	
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
	Field Green	Drive	Colchester0005.pdf								
30	Conquest	Circle	Colchester.pdf		N	N	N	N	—	9/21/16	
32	Conquest	Circle	Colchester.pdf								
35	Conquest	Circle	Colchester0000.pdf								
56	Conquest	Circle	Colchester0000.pdf								
63	Conquest	Circle	Colchester0001.pdf								
65	Conquest	Circle	Colchester0002.pdf								
15A	Coolidge	Court	Colchester0000.pdf		N	N	N	N	—	9/29/16	
15B	Coolidge	Court	Colchester0001.pdf								
15C	Coolidge	Court	Colchester0002.pdf								
22A	Coolidge	Court	Colchester0003.pdf								
22B	Coolidge	Court	Colchester0004.pdf								
22C	Coolidge	Court	Colchester0005.pdf								
35	Coolidge	Court	Colchester0006.pdf								
38	Coolidge	Court	Colchester0007.pdf								
117-119	Country Meadows		Colchester0000.pdf		N	N	N	N	—	9/26/16	
135-137	Country Meadows		Colchester0001.pdf								
153-155	Country Meadows		Colchester0002.pdf								
175	Country Meadows		Colchester0003.pdf								
177	Country Meadows		Colchester0000.pdf								
231	Country Meadows		Colchester0004.pdf								
233	Country Meadows		Colchester0000.pdf								
251	Country Meadows		Colchester0005.pdf								
252-254	Country Meadows		Colchester0006.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
253	Country Meadows		Colchester0007.pdf	1501-422006	N	N	N	N	—	9/14/16	Premier
266-268	Country Meadows		Colchester0008.pdf		N	N	N	N	—	↓	
002A	Creek Farm	Road	Colchester0001.pdf		N	N	N	N	—	9/14/16	
002B	Creek Farm	Road	Colchester0002.pdf								
002C	Creek Farm	Road	Colchester0003.pdf								
002C	Creek Farm	Road	Colchester0004.pdf								
002D	Creek Farm	Road	Colchester0005.pdf								
003A	Creek Farm	Road	Colchester0006.pdf								
003B	Creek Farm	Road	Colchester0007.pdf								
005A	Creek Farm	Road	Colchester0008.pdf								
005B	Creek Farm	Road	Colchester0009.pdf								
63	Creek Farm	Road	Colchester0010.pdf								
65	Creek Farm	Road	Colchester0000.pdf								
65	Creek Farm	Road	Colchester0000.pdf								
65	Creek Farm	Road	Colchester0000.pdf								
65	Creek Farm	Road	Colchester0000.pdf								
292	Creek Farm	Road	Colchester0012.pdf								
314	Creek Farm	Road	Colchester0013.pdf								
319	Creek Farm	Road	Colchester0014.pdf								
330	Creek Farm	Road	Colchester0015.pdf								
351	Creek Farm	Road	Colchester0016.pdf								
424	Creek Farm	Road	Colchester0000.pdf								
452	Creek Farm	Road	Colchester0000.pdf								
479	Creek Farm	Road	Colchester0000.pdf								
505	Creek Farm	Road	Colchester0019.pdf								
525	Creek Farm	Road	Colchester0020.pdf								
604	Creek Farm	Road	Colchester0021.pdf								
612	Creek Farm	Road	Colchester0022.pdf								
631	Creek Farm	Road	Colchester0023.pdf								
636	Creek Farm	Road	Colchester0024.pdf								
668	Creek Farm	Road	Colchester0000.pdf								
687	Creek Farm	Road	Colchester0025.pdf								
694	Creek Farm	Road	Colchester0026.pdf								
735	Creek Farm	Road	Colchester0027.pdf								
775	Creek Farm	Road	Colchester00280000.pdf								
801	Creek Farm	Road	Colchester00290000.pdf								
823	Creek Farm	Road	Colchester0030.pdf								
843	Creek Farm	Road	Colchester0031.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
879	Creek Farm	Road	Colchester0032.pdf	1501-422006	N	N	N	N	—	5/16/16	Premier
907	Creek Farm	Road	Colchester0033.pdf		↓	↓	↓	↓	—	↓	
5	Creek	Glenn	Colchester0000.pdf		N	N	N	N	—	4/26/16	
11	Creek	Glenn	Colchester0001.pdf								
32	Creek	Glenn	Colchester0002.pdf								
35	Creek	Glenn	Colchester0003.pdf								
50	Creek	Glenn	Colchester0004.pdf								
53	Creek	Glenn	Colchester0005.pdf								
72	Creek	Glenn	Colchester0006.pdf								
75	Creek	Glenn	Colchester0007.pdf								
96	Creek	Glenn	Colchester0000.pdf								
110	Creek	Glenn	Colchester0000.pdf								
110	Creek	Glenn	Colchester0009.pdf								
113	Creek	Glenn	Colchester0010.pdf								
128	Creek	Glenn	Colchester0011.pdf								
134	Creek	Glenn	Colchester0012.pdf								
14	Crossfield	Drive	Colchester0000.pdf		N	N	N	N	—	4/20/16	
15	Crossfield	Drive	Colchester0000.pdf								
16	Crossfield	Drive	Colchester0000.pdf								
17	Crossfield	Drive	Colchester0001.pdf								
30	Crossfield	Drive	Colchester0002.pdf								
35	Crossfield	Drive	Colchester0003.pdf								
53	Crossfield	Drive	Colchester0004.pdf								
75	Crossfield	Drive	Colchester0005.pdf								
77	Crossfield	Drive	Colchester0006.pdf								
103	Crossfield	Drive	Colchester0000.pdf								
105	Crossfield	Drive	Colchester0000.pdf								
134	Crossfield	Drive	Colchester0012.pdf								
137	Crossfield	Drive	Colchester0000.pdf								
141	Crossfield	Drive	Colchester0000.pdf								
150	Crossfield	Drive	Colchester0013.pdf								
159	Crossfield	Drive	Colchester0000.pdf								
170	Crossfield	Drive	Colchester0014.pdf								
173	Crossfield	Drive	Colchester0015.pdf								
189	Crossfield	Drive	Colchester0016.pdf								
190	Crossfield	Drive	Colchester0017.pdf								
213	Crossfield	Drive	Colchester0018.pdf								
215	Crossfield	Drive	Colchester0019.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
222	Crossfield	Drive	Colchester0020.pdf	1501-44Auo6	N	N	N	N	—	4/20/16	Premier
245	Crossfield	Drive	Colchester0021.pdf								
247	Crossfield	Drive	Colchester0022.pdf								
248	Crossfield	Drive	Colchester0023.pdf								
267	Crossfield	Drive	Colchester0024.pdf								
270	Crossfield	Drive	Colchester0025.pdf								
285	Crossfield	Drive	Colchester0027.pdf								
331	Crossfield	Drive	Colchester0027.pdf								
345	Crossfield	Drive	Colchester0028.pdf								
365	Crossfield	Drive	Colchester0000.pdf								
383	Crossfield	Drive	Colchester0030.pdf								
406	Crossfield	Drive	Colchester0031.pdf								
	Dalton	Drive	Colchester0000.pdf		N	N	N	N	—	4/21/16	
22	Deer	Lane	Colchester0001.pdf		N	N	N	N	—	9/26/16	
45	Deer	Lane	Colchester0000.pdf								
58	Deer	Lane	Colchester0003.pdf								
74	Deer	Lane	Colchester0004.pdf								
77	Deer	Lane	Colchester0005.pdf								
92	Deer	Lane	Colchester0006.pdf								
103	Deer	Lane	Colchester0007.pdf								
112	Deer	Lane	Colchester0008.pdf								
127	Deer	Lane	Colchester0009.pdf								
130	Deer	Lane	Colchester0010.pdf								
143	Deer	Lane	Colchester0011.pdf								
172	Deer	Lane	Colchester0012.pdf								
190A	Deer	Lane	Colchester0014.pdf								
190B	Deer	Lane	Colchester0013.pdf								
203A	Deer	Lane	Colchester0000.pdf								
203A	Deer	Lane	Colchester0000.pdf								
203B	Deer	Lane	Colchester0015.pdf								
11 thru 13	Diane	Lane	Colchester0000.pdf		N	N	N	N	—	4/23/16	
32-34	Diane	Lane	Colchester0000.pdf		N	N	N	N	—		
16	Don Mar	Terrace	Colchester0000.pdf		N	N	N	N	—	4/21/16	
35	Don Mar	Terrace	Colchester0000.pdf								
46	Don Mar	Terrace	Colchester0001.pdf								
57	Don Mar	Terrace	Colchester0002.pdf								
69	Don Mar	Terrace	Colchester0003.pdf								
81	Don Mar	Terrace	Colchester0004.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
93	Don Mar	Terrace	Colchester0005.pdf	1501-A11006	N	N	N	N	—	9/21/16	Premier
121	Don Mar	Terrace	Colchester0000.pdf								
128	Don Mar	Terrace	Colchester00040000.pdf								
150	Don Mar	Terrace	Colchester0000.pdf								
170	Don Mar	Terrace	Colchester0006.pdf								
175	Don Mar	Terrace	Colchester0007.pdf								
190	Don Mar	Terrace	Colchester0008.pdf								
195	Don Mar	Terrace	Colchester0000.pdf								
233	Don Mar	Terrace	Colchester0000.pdf								
259	Don Mar	Terrace	Colchester0000.pdf								
7	Douglas	Drive	Colchester0000.pdf		N	N	N	N	—	9/29/16	
23	Douglas	Drive	Colchester0001.pdf								
45	Douglas	Drive	Colchester0002.pdf								
67	Douglas	Drive	Colchester0003.pdf								
80	Douglas	Drive	Colchester0004.pdf								
85	Douglas	Drive	Colchester0005.pdf								
095A	Douglas	Drive	Colchester0006.pdf								
095B	Douglas	Drive	Colchester0007.pdf								
095C	Douglas	Drive	Colchester0008.pdf								
100	Douglas	Drive	Colchester0009.pdf								
106	Douglas	Drive	Colchester0010.pdf								
68	Dunlop	Way	Colchester0004.pdf		N	N	N	N	—	9/19/16	
24	Dunlop	Way	Colchester0000.pdf								
62	Dunlop	Way	Colchester0000.pdf								
76	Dunlop	Way	Colchester0001.pdf								
90	Dunlop	Way	Colchester0002.pdf								
92	Dunlop	Way	Colchester0003.pdf								
31	Eagle Park	Drive	Colchester0000.pdf		N	N	N	N	—	9/27/16	
51	Eagle Park	Drive	Colchester0002.pdf								
69	Eagle Park	Drive	Colchester0005.pdf								
94	Eagle Park	Drive	Colchester0007.pdf								
118	Eagle Park	Drive	Colchester0008.pdf								
146	Eagle Park	Drive	Colchester0009.pdf								
162	Eagle Park	Drive	Colchester0010.pdf								
173	Eagle Park	Drive	Colchester0011.pdf								
186	Eagle Park	Drive	Colchester0012.pdf								
197	Eagle Park	Drive	Colchester0013.pdf								
212	Eagle Park	Drive	Colchester0014.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
228	Eagle Park	Drive	Colchester0015.pdf	1501-Arrowle	N	N	N	N	—	9/27/16	Premier
234	Eagle Park	Drive	Colchester0016.pdf								
241	Eagle Park	Drive	Colchester0017.pdf								
254	Eagle Park	Drive	Colchester0018.pdf								
274	Eagle Park	Drive	Colchester0019.pdf								
286	Eagle Park	Drive	Colchester0020.pdf								
294	Eagle Park	Drive	Colchester0021.pdf								
297	Eagle Park	Drive	Colchester0022.pdf								
318	Eagle Park	Drive	Colchester0024.pdf								
321	Eagle Park	Drive	Colchester0026.pdf								
345	Eagle Park	Drive	Colchester0027.pdf								
370	Eagle Park	Drive	Colchester0028.pdf								
390	Eagle Park	Drive	Colchester0029.pdf								
404	Eagle Park	Drive	Colchester0030.pdf		N	N	N	N	—		
258	East Lakeshore	Drive	Colchester0000.pdf	—						9/27/16	
274	East Lakeshore	Drive	Colchester0001.pdf								
286	East Lakeshore	Drive	Colchester0002.pdf								
306	East Lakeshore	Drive	Colchester.pdf								
335	East Lakeshore	Drive	Colchester0000.pdf								
338	East Lakeshore	Drive	Colchester0004.pdf								
355	East Lakeshore	Drive	Colchester0005.pdf								
367	East Lakeshore	Drive	Colchester0006.pdf								
377	East Lakeshore	Drive	Colchester0007.pdf								
686	East Lakeshore	Drive	Colchester0000.pdf								
712	East Lakeshore	Drive	Colchester0000.pdf								
728	East Lakeshore	Drive	Colchester0000.pdf								
738	East Lakeshore	Drive	Colchester0000.pdf								
742	East Lakeshore	Drive	Colchester0000.pdf								
756	East Lakeshore	Drive	Colchester0000.pdf								
766	East Lakeshore	Drive	Colchester0000.pdf								
777	East Lakeshore	Drive	Colchester0000.pdf								
782	East Lakeshore	Drive	Colchester0000.pdf								
796	East Lakeshore	Drive	Colchester0000.pdf								
815	East Lakeshore	Drive	Colchester0000.pdf								
824	East Lakeshore	Drive	Colchester0008.pdf								
835	East Lakeshore	Drive	Colchester0009.pdf								
841	East Lakeshore	Drive	Colchester0010.pdf								
869	East Lakeshore	Drive	Colchester0000.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
877	East Lakeshore	Drive	Colchester0011.pdf	1501-4nrode	N	N	N	N	~	9/27/16	Premier
882	East Lakeshore	Drive	Colchester0012.pdf								
883	East Lakeshore	Drive	Colchester0013.pdf								
896	East Lakeshore	Drive	Colchester0014.pdf								
903	East Lakeshore	Drive	Colchester0018.pdf								
904	East Lakeshore	Drive	Colchester0015.pdf								
912	East Lakeshore	Drive	Colchester0016.pdf								
922	East Lakeshore	Drive	Colchester0017.pdf								
926	East Lakeshore	Drive	Colchester0019.pdf								
938	East Lakeshore	Drive	Colchester0021.pdf								
946	East Lakeshore	Drive	Colchester0022.pdf								
974	East Lakeshore	Drive	Colchester0023.pdf								
996	East Lakeshore	Drive	Colchester0024.pdf								
1014	East Lakeshore	Drive	Colchester0000.pdf								
1070	East Lakeshore	Drive	Colchester0025.pdf								
1084	East Lakeshore	Drive	Colchester0026.pdf								
1090	East Lakeshore	Drive	Colchester0027.pdf								
1107	East Lakeshore	Drive	Colchester0000.pdf								
1162	East Lakeshore	Drive	Colchester0028.pdf								
1172	East Lakeshore	Drive	Colchester0000.pdf								
1172	East Lakeshore	Drive	Colchester0000.pdf								
1172	East Lakeshore	Drive	U5-6Colchester0000.pdf								
1175	East Lakeshore	Drive	Colchester0000.pdf								
1189	East Lakeshore	Drive	Colchester0000.pdf								
1201	East Lakeshore	Drive	Colchester0029.pdf								
1230	East Lakeshore	Drive	Colchester0030.pdf								
1277	East Lakeshore	Drive	Colchester0000.pdf								
1343	East Lakeshore	Drive	Colchester0032.pdf								
1355	East Lakeshore	Drive	Colchester0033.pdf								
1370	East Lakeshore	Drive	Colchester0034.pdf								
1384	East Lakeshore	Drive	Colchester0035.pdf								
1393	East Lakeshore	Drive	Colchester0036.pdf								
1403	East Lakeshore	Drive	Colchester0037.pdf								
1426	East Lakeshore	Drive	Colchester0038.pdf								
1428	East Lakeshore	Drive	Colchester0039.pdf								
1483	East Lakeshore	Drive	Colchester0041.pdf		↓	↓	↓	↓	↓	↓	
19	East	Road	Colchester00000000.pdf		N	N	N	N	—	9/22/16	
21	East	Road	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
43	Edgewood	Drive	Colchester0000.pdf	1501-422006	N	N	N	N	—	4/27/16	Premier
60	Edgewood	Drive	Colchester0001.pdf								
63	Edgewood	Drive	Colchester0002.pdf								
74	Edgewood	Drive	Colchester0003.pdf								
95	Edgewood	Drive	Colchester0004.pdf								
100	Edgewood	Drive	Colchester0005.pdf								
108	Edgewood	Drive	Colchester0006.pdf								
126	Edgewood	Drive	Colchester0007.pdf								
127	Edgewood	Drive	Colchester0008.pdf								
146	Edgewood	Drive	Colchester0009.pdf								
147	Edgewood	Drive	Colchester0010.pdf								
168	Edgewood	Drive	Colchester0011.pdf								
171	Edgewood	Drive	Colchester0012.pdf								
184	Edgewood	Drive	Colchester0013.pdf								
191	Edgewood	Drive	Colchester0000.pdf								
204	Edgewood	Drive	Colchester0014.pdf								
207	Edgewood	Drive	Colchester0015.pdf								
229	Edgewood	Drive	Colchester0016.pdf								
234	Edgewood	Drive	Colchester0017.pdf								
247	Edgewood	Drive	Colchester0018.pdf								
260	Edgewood	Drive	Colchester0019.pdf								
265	Edgewood	Drive	Colchester0020.pdf								
290	Edgewood	Drive	Colchester0021.pdf								
326	Edgewood	Drive	Colchester0022.pdf								
329	Edgewood	Drive	Colchester0023.pdf								
342	Edgewood	Drive	Colchester0024.pdf								
358	Edgewood	Drive	Colchester0025.pdf								
363	Edgewood	Drive	Colchester0000.pdf								
374	Edgewood	Drive	Colchester0026.pdf								
394	Edgewood	Drive	Colchester0027.pdf								
413	Edgewood	Drive	Colchester0028.pdf								
416	Edgewood	Drive	Colchester0000.pdf								
430	Edgewood	Drive	Colchester0029.pdf								
443	Edgewood	Drive	Colchester0000.pdf								
490	Edgewood	Drive	Colchester0030.pdf		↓	↓	↓	↓	↓	↓	
34	Elderberry	Lane	Colchester0000.pdf		N	N	N	N	—	9/20/16	
57	Elderberry	Lane	Colchester0001.pdf		N	N	N	N	—	↓	
34	Emmas	Way	Colchester0000.pdf	↓	N	N	N	N	—	9/21/16	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
38	Emmas	Way	Colchester0000.pdf	1501-442006	N	N	N	N	—	9/21/16	Premier
70	Emmas	Way	Colchester0000.pdf						—		
96	Emmas	Way	Colchester0000.pdf						—		
98	Emmas	Way	Colchester0000.pdf						—		
39	Entrance	Road	Colchester0000.pdf						—		
46	Entrance	Road	Colchester0002.pdf		N	N	N	N	—	9/22/16	
56	Entrance	Road	Colchester0001.pdf						—		
76	Entrance	Road	Colchester0003.pdf						—		
	Essex	Road	Colchester0000.pdf						—		
33	Ethan Allen	Avenue	Colchester0001.pdf		N	N	N	N	—	9/29/16	
81	Ethan Allen	Avenue	Colchester0002.pdf		N	N	N	N	—	9/29/16	
0123A	Ethan Allen	Avenue	Colchester0003.pdf								
0123B	Ethan Allen	Avenue	Colchester0004.pdf								
169	Ethan Allen	Avenue	Colchester0005.pdf								
204	Ethan Allen	Avenue	Colchester0006.pdf								
223	Ethan Allen	Avenue	Colchester0007.pdf								
224	Ethan Allen	Avenue	Colchester0009.pdf								
279	Ethan Allen	Avenue	Colchester0010.pdf								
282	Ethan Allen	Avenue	Colchester0012.pdf								
309	Ethan Allen	Avenue	Colchester0013.pdf								
337	Ethan Allen	Avenue	Colchester0015.pdf								
0363A	Ethan Allen	Avenue	Colchester0017.pdf								
0363B	Ethan Allen	Avenue	Colchester0018.pdf								
0397A	Ethan Allen	Avenue	Colchester0020.pdf								
0397B	Ethan Allen	Avenue	Colchester0000.pdf								
0397C	Ethan Allen	Avenue	Colchester0001.pdf								
0397D	Ethan	Allen	Colchester0002.pdf								
475	Ethan	Allen	Colchester0000.pdf								
475	Ethan	Allen	Colchester0000.pdf								
1002	Ethan	Allen	Colchester0026.pdf								
1003	Ethan	Allen	Colchester0027.pdf								
1004	Ethan	Allen	Colchester0028.pdf								
1005	Ethan	Allen	Colchester0029.pdf								
1006	Ethan	Allen	Colchester0030.pdf								
1007	Ethan	Allen	Colchester0031.pdf								
1110	Ethan	Allen	Colchester0037.pdf								
1111	Ethan	Allen	Colchester0038.pdf								
1112	Ethan	Allen	Colchester0033.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
1113	Ethan	Allen	Colchester0034.pdf	1501-444006	N	N	N	N	—	9/29/16	Premier
1114	Ethan	Allen	Colchester0035.pdf						—		
1115	Ethan	Allen	Colchester0036.pdf						—		
99	Evening Sun	Drive	Colchester0000.pdf		N	N	N	N	—	9/26/16	
113	Evening Sun	Drive	Colchester0000.pdf		N	N	N	N	—		
18	Everbreeze	Drive	Colchester0000.pdf		N	N	N	N	—	9/26/16	
25	Everbreeze	Drive	Colchester0001.pdf								
42	Everbreeze	Drive	Colchester0002.pdf								
56	Everbreeze	Drive	Colchester0003.pdf								
72	Everbreeze	Drive	Colchester0004.pdf								
73	Everbreeze	Drive	Colchester0005.pdf								
86	Everbreeze	Drive	Colchester0006.pdf								
102	Everbreeze	Drive	Colchester0007.pdf								
109	Everbreeze	Drive	Colchester0008.pdf								
124	Everbreeze	Drive	Colchester0009.pdf								
129	Everbreeze	Drive	Colchester0010.pdf								
149	Everbreeze	Drive	Colchester0011.pdf								
164	Everbreeze	Drive	Colchester0012.pdf								
167	Everbreeze	Drive	Colchester0013.pdf								
183	Everbreeze	Drive	Colchester0014.pdf								
184	Everbreeze	Drive	Colchester0015.pdf								
200	Everbreeze	Drive	Colchester0016.pdf								
215	Everbreeze	Drive	Colchester0017.pdf								
218	Everbreeze	Drive	Colchester0018.pdf								
234	Everbreeze	Drive	Colchester0019.pdf								
263	Everbreeze	Drive	Colchester0020.pdf								
264	Everbreeze	Drive	Colchester0021.pdf								
16	Evergreen	Circle	Colchester0000.pdf		N	N	N	N		9/28/16	
52	Evergreen	Circle	Colchester.pdf								
022A	Fern	Court	Colchester0002.pdf		N	N	N	N	—	9/22/16	
022B	Fern	Court	Colchester0003.pdf								
48	Fern	Court	Colchester0000.pdf								
67	Fern	Court	Colchester0004.pdf								
77	Fern	Court	Colchester0005.pdf								
79	Fern	Court	Colchester0006.pdf								
97	Fern	Court	Colchester0007.pdf								
105	Fern	Court	Colchester0008.pdf								
111	Fern	Court	Colchester0009.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
112	Fern	Court	Colchester0000.pdf	1501-442006	N	N	N	N	—	9/20/16	Premier
130	Fern	Court	Colchester0010.pdf								
148	Fern	Court	Colchester0000.pdf								
162	Fern	Court	Colchester0011.pdf								
163	Fern	Court	Colchester0012.pdf								
173	Fern	Court	Colchester0013.pdf								
183-191	Fern	Court	Colchester0014.pdf								
190	Fern	Court	Colchester0015.pdf								
193	Fern	Court	Colchester0000.pdf								
12	Field Green	Drive	Colchester0010.pdf		N	N	N	N	—	9/22/16	
16	Field Green	Drive	Colchester0000.pdf								
32	Field Green	Drive	Colchester0001.pdf								
41	Field Green	Drive	Colchester0002.pdf								
58	Field Green	Drive	Colchester0003.pdf								
70	Field Green	Drive	Colchester0004.pdf								
71	Field Green	Drive	Colchester0005.pdf								
90	Field Green	Drive	Colchester0006.pdf								
91	Field Green	Drive	Colchester0007.pdf								
109	Field Green	Drive	Colchester0008.pdf								
110	Field Green	Drive	Colchester0009.pdf								
128	Foley	Road	Colchester0000.pdf		N	N	N	N	—	9/21/16	
135	Foley	Road	Colchester0000.pdf						—		
66	Foley	Road	Colchester0000.pdf						—		
71	Foley	Road	Colchester0000.pdf						—		
27	Ford	Lane	Colchester0000.pdf		N	N	N	N	—	9/22/16	
57	Ford	Lane	Colchester0000.pdf						—		
59	Ford	Lane	Colchester0000.pdf						—		
64-66	Ford	Lane	Colchester0001.pdf						—		
71-73	Ford	Lane	Colchester0002.pdf						—		
36	Forman	Drive	Colchester0000.pdf		N	N	N	N	—	9/23/16	
45	Forman	Drive	Colchester0002.pdf								
65	Forman	Drive	Colchester0001.pdf								
76	Forman	Drive	Colchester0003.pdf								
85	Forman	Drive	Colchester0004.pdf								
96	Forman	Drive	Colchester0005.pdf								
99	Forman	Drive	Colchester0006.pdf								
114	Forman	Drive	Colchester0007.pdf								
115	Forman	Drive	Colchester0008.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
122	Forman	Drive	Colchester0009.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
	Fort Ethan Allen		Colchester0000.pdf	CRF [illegible]							
19	Fox Run	Lane	Colchester0000.pdf		N	N	N	N	—	9/26/16	
45	Fox Run	Lane	Colchester0001.pdf								
62	Fox Run	Lane	Colchester0002.pdf								
77	Fox Run	Lane	Colchester0003.pdf								
90	Fox Run	Lane	Colchester0004.pdf								
97	Fox Run	Lane	Colchester0005.pdf								
119	Fox Run	Lane	Colchester0006.pdf								
205-209-213	Fox Run	Lane	Colchester0000.pdf								
208-214-220	Fox Run	Lane	Colchester0000.pdf								
229	Fox Run	Lane	Colchester		RETIRED.pdf						
238-242-250	Fox Run	Lane	Colchester0000.pdf								
243-247	Fox Run	Lane	Colchester0000.pdf								
258-262-270	Fox Run	Lane	Colchester0000.pdf								
259-263-267	Fox Run	Lane	Colchester0000.pdf								
311	Fox Run	Lane	Colchester0000.pdf								
20-22	Garden	Lane	Colchester0000.pdf		N	N	N	N	—	9/26/16	
44-46	Garden	Lane	Colchester0001.pdf						—		
54-56	Garden	Lane	Colchester0002.pdf						—		
78-80	Garden	Lane	Colchester0003.pdf						—		
23	Giffin	Court	Colchester0000.pdf		N	N	N	N	—	9/27/16	
43	Giffin	Court	Colchester0001.pdf								
52	Giffin	Court	Colchester0002.pdf								
61	Giffin	Court	Colchester0003.pdf								
69	Giffin	Court	Colchester0004.pdf								
84	Giffin	Court	Colchester0005.pdf								
93	Giffin	Court	Colchester0006.pdf								
182	Giffin	Court	Colchester0000.pdf								
182	Giffin	Court	Colchester0000.pdf								
182	Giffin	Court	Colchester0000.pdf								
182	Giffin	Court	Colchester0000.pdf								
182	Giffin	Court	Colchester0000.pdf								
011A	Gilman	Circle	Colchester0000.pdf		N	N	N	N	—	9/28/16	
011B	Gilman	Circle	Colchester0001.pdf								
011C	Gilman	Circle	Colchester0002.pdf								
13	Gilman	Circle	Colchester0003.pdf								
018A	Gilman	Circle	Colchester0004.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
018B	Gilman	Circle	Colchester0005.pdf	1501-442006	N	N	N	N	—	9/25/16	Premier
018C	Gilman	Circle	Colchester0006.pdf								
35	Gilman	Circle	Colchester0007.pdf								
036A	Gilman	Circle	Colchester0008.pdf								
036B	Gilman	Circle	Colchester0009.pdf								
036C	Gilman	Circle	Colchester0010.pdf								
46	Gilman	Circle	Colchester0011.pdf								
063A	Gilman	Circle	Colchester0012.pdf								
063B	Gilman	Circle	Colchester0013.pdf								
063C	Gilman	Circle	Colchester0014.pdf								
084A	Gilman	Circle	Colchester0015.pdf								
084B	Gilman	Circle	Colchester0016.pdf								
084C	Gilman	Circle	Colchester0017.pdf								
107	Gilman	Circle	Colchester0018.pdf								
113	Gilman	Circle	Colchester0019.pdf								
139A	Gilman	Circle	Colchester0020.pdf								
139B	Gilman	Circle	Colchester0021.pdf								
139C	Gilman	Circle	Colchester0022.pdf								
153	Gilman	Circle	Colchester0023.pdf								
16	Goodsell	Point	Road	Colchester0000.pdf	N	N	N	N	—	9/26/16	
28	Goodsell	Point	Road	Colchester0000.pdf	N	N	N	N	—		
9	Gorge	Road	Colchester0000.pdf		N	N	N	N	—	9/29/16	
31	Gorge	Road	Colchester0000.pdf						—		
41	Gorge	Road	Colchester0000.pdf						—		
73	Gorge	Road	Colchester0000.pdf						—		
021-23	Granite Creek	Road	Colchester0000.pdf		N	N	N	N	—	9/26/16	
047-49	Granite Creek	Road	Colchester0000.pdf								
86	Granite Creek	Road	Colchester0001.pdf								
101	Granite Creek	Road	Colchester0002.pdf								
103	Granite Creek	Road	Colchester0000.pdf								
156	Granite Creek	Road	Colchester0003.pdf								
193-195	Granite Creek	Road	Colchester0004.pdf								
200	Granite Creek	Road	Colchester0006.pdf								
225-227	Granite Creek	Road	Colchester0005.pdf								
259-261	Granite Creek	Road	Colchester0007.pdf								
34	Greenwood	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
35	Greenwood	Drive	Colchester0001.pdf						—		
57	Greenwood	Drive	Colchester0002.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
78	Greenwood	Drive	Colchester0003.pdf	1501-4nhoule	N	N	N	N	—	9/20/16	Premier
98	Greenwood	Drive	Colchester0004.pdf								
101	Greenwood	Drive	Colchester0005.pdf								
118	Greenwood	Drive	Colchester0006.pdf								
121	Greenwood	Drive	Colchester0007.pdf								
140	Greenwood	Drive	Colchester0008.pdf								
141	Greenwood	Drive	Colchester0009.pdf								
160	Greenwood	Drive	Colchester0010.pdf								
161	Greenwood	Drive	Colchester0000.pdf								
204	Greenwood	Drive	Colchester0000.pdf								
225	Greenwood	Drive	Colchester0000.pdf								
244	Greenwood	Drive	Colchester0000.pdf								
34	Gregg	Lane	Colchester0000.pdf		N	N	N	N	—	9/21/16	
35	Gregg	Lane	Colchester0000.pdf								
60	Gregg	Lane	Colchester0001.pdf								
69	Gregg	Lane	Colchester0000.pdf								
78	Gregg	Lane	Colchester0002.pdf								
98	Gregg	Lane	Colchester0000.pdf								
017-19	Grey Birch	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
037-39	Grey Birch	Drive	Colchester0001.pdf								
38	Grey Birch	Drive	Colchester0002.pdf								
057-59	Grey Birch	Drive	Colchester0003.pdf								
64	Grey Birch	Drive	Colchester0000.pdf								
66	Grey Birch	Drive	Colchester0000.pdf								
86	Grey Birch	Drive	Colchester0004.pdf								
105-107	Grey Birch	Drive	Colchester0006.pdf								
106-108	Grey Birch	Drive	Colchester0005.pdf								
123-125	Grey Birch	Drive	Colchester0007.pdf								
172	Grey Birch	Drive	Colchester0008.pdf								
179-181	Grey Birch	Drive	Colchester0009.pdf								
192	Grey Birch	Drive	Colchester0000.pdf								
203-205	Grey Birch	Drive	Colchester0010.pdf								
214	Grey Birch	Drive	Colchester0011.pdf								
216	Grey Birch	Drive	Colchester0012.pdf								
227	Grey Birch	Drive	Colchester0013.pdf								
229	Grey Birch	Drive	Colchester0014.pdf								
245	Grey Birch	Drive	Colchester0015.pdf								
104-116	Hailey's	Way	Colchester0000.pdf		N	N	N	N	—	9/27/16	

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
120-126	Hailey's	Way	Colchester0000.pdf	1501-Arh 036	N	N	N	N	—	9/27/16	Premier
17-27	Hailey's	Way	Colchester0000.pdf								
35-43	Hailey's	Way	Colchester0000.pdf								
42-54	Hailey's	Way	Colchester0000.pdf								
51	Hailey's	Way	Colchester0000.pdf								
64-76	Hailey's	Way	Colchester0000.pdf								
86-96	Hailey's	Way	Colchester0000.pdf		↓	↓	↓	↓	↓	↓	
36-38-48-50	Half Moon	Terrace	Colchester0000.pdf		N	N	N	N	—	9/21/16	
38	Half Moon	Terrace	Colchester0000.pdf						—		
48-50	Half Moon	Terrace	Colchester0000.pdf						—		
58-60	Half Moon	Terrace	Colchester0001.pdf						—		
63	Half Moon	Terrace	Colchester0002.pdf		↓	↓	↓	↓	—	↓	
031-43	Hannah's	Place	Colchester0000.pdf		N	N	N	N	—	9/27/16	
049-61	Hannah's	Place	Colchester0001.pdf								
070-82	Hannah's	Place	Colchester0002.pdf								
071-93	Hannah's	Place	Colchester0003.pdf								
090-98	Hannah's	Place	Colchester0004.pdf								
100-104	Hannah's	Place	Colchester0005.pdf								
106-116	Hannah's	Place	Colchester0006.pdf		↓	↓	↓	↓	↓	↓	
12	Harbor	Lane	Colchester0000.pdf		N	N	N	N	—	9/29/16	
18	Harbor	Lane	Colchester0000.pdf						—		
23	Harbor	Lane	Colchester0001.pdf						—		
25	Harbor	Lane	Colchester0002.pdf						—		
26	Harbor	Lane	Colchester0003.pdf		↓	↓	↓	↓	—	↓	
17	Hawkes	Way	Colchester0000.pdf		N	N	N	N	—	9/27/16	
71	Hawkes	Way	Colchester0001.pdf								
72	Hawkes	Way	Colchester0002.pdf								
99	Hawkes	Way	Colchester0003.pdf								
100	Hawkes	Way	Colchester0003.pdf								
123	Hawkes	Way	Colchester0000.pdf								
126	Hawkes	Way	Colchester0004.pdf								
148	Hawkes	Way	Colchester0005.pdf								
160	Hawkes	Way	Colchester0006.pdf		↓	↓	↓	↓	↓	↓	
028A	Hazelwood	Place	Colchester0000.pdf		N	N	N	N	—	9/27/16	
028B	Hazelwood	Place	Colchester0000.pdf						—		
028B	Hazelwood	Place	Colchester0001.pdf						—		
082A	Hazelwood	Place	Colchester0001.pdf						—		
082B	Hazelwood	Place	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
082C	Hazelwood	Place	Colchester0001.pdf	1501-422006	N	N	N	N	—	9/21/16	Premier
164A	Hazelwood	Place	Colchester0003.pdf						—		
164B	Hazelwood	Place	Colchester0000.pdf						—		
164C	Hazelwood	Place	Colchester0001.pdf						—		
28-2	Heather	Circle	Colchester.pdf		N	N	N	N	—	9/28/16	
46-1	Heather	Circle	Colchester.pdf								
70-1	Heather	Circle	Colchester.pdf								
70-2	Heather	Circle	Colchester.pdf								
78-1	Heather	Circle	Colchester.pdf								
78-2	Heather	Circle	Colchester.pdf								
44	Hegeman	Avenue	Colchester0000.pdf		N	N	N	N	—	9/29/16	
48	Hegeman	Avenue	Colchester0001.pdf								
116	Hegeman	Avenue	Colchester0003.pdf								
142	Hegeman	Avenue	Colchester0004.pdf								
162	Hegeman	Avenue	Colchester0005.pdf								
182	Hegeman	Avenue	Colchester0007.pdf								
183	Hegeman	Avenue	Colchester0008.pdf								
199	Hegeman	Avenue	Colchester0010.pdf								
206	Hegeman	Avenue	Colchester0000.pdf								
218	Hegeman	Avenue	Colchester0000.pdf								
237	Hegeman	Avenue	Colchester0012.pdf								
265	Hegeman	Avenue	Colchester0013.pdf								
340	Hegeman	Avenue	Colchester0015.pdf								
364	Hegeman	Avenue	Colchester0000.pdf								
377	Hegeman	Avenue	Colchester0019.pdf								
394	Hegeman	Avenue	Colchester0020.pdf								
424	Hegeman	Avenue	Colchester0022.pdf								
427	Hegeman	Avenue	Colchester0023.pdf								
462	Hegeman	Avenue	Colchester0024.pdf								
475	Hegeman	Avenue	Colchester0025.pdf								
478	Hegeman	Avenue	Colchester0026.pdf								
492	Hegeman	Avenue	Colchester0027.pdf								
513	Hegeman	Avenue	Colchester0028.pdf								
049A	Heineberg	Drive	Colchester0000.pdf		N	N	N	N	—	9/22/16	
049B	Heineberg	Drive	Colchester0000.pdf						—		
049C	Heineberg	Drive	Colchester0001.pdf						—		
049D	Heineberg	Drive	Colchester0002.pdf						—		
79	Heineberg	Drive	Colchester0001.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
109	Heineberg	Drive	Colchester0002.pdf	1501-422006	N	N	N	N	—	9/22/16	Premier
110	Heineberg	Drive	Colchester0003.pdf								
133	Heineberg	Drive	Colchester0004.pdf								
142A	Heineberg	Drive	Colchester0005.pdf								
142B	Heineberg	Drive	Colchester0006.pdf								
158	Heineberg	Drive	Colchester0007.pdf								
165	Heineberg	Drive	Colchester0008.pdf								
172A	Heineberg	Drive	Colchester0009.pdf								
172B	Heineberg	Drive	Colchester0000.pdf								
185	Heineberg	Drive	Colchester0010.pdf								
194	Heineberg	Drive	Colchester0011.pdf								
218	Heineberg	Drive	Colchester0012.pdf								
235	Heineberg	Drive	Colchester0000.pdf								
257	Heineberg	Drive	Colchester0013.pdf								
265	Heineberg	Drive	Colchester0000.pdf								
270	Heineberg	Drive	Colchester0016.pdf								
272	Heineberg	Drive	Colchester0017.pdf								
283	Heineberg	Drive	Colchester0000.pdf								
295	Heineberg	Drive	Colchester0018.pdf								
311	Heineberg	Drive	Colchester0001.pdf								
335	Heineberg	Drive	Colchester0019.pdf								
337	Heineberg	Drive	Colchester0020.pdf								
350	Heineberg	Drive	Colchester0021.pdf								
369	Heineberg	Drive	Colchester0022.pdf								
385	Heineberg	Drive	Colchester0024.pdf								
385	Heineberg	Drive	Colchester0000.pdf								
398	Heineberg	Drive	Colchester0025.pdf								
414	Heineberg	Drive	Colchester0026.pdf								
416	Heineberg	Drive	Colchester0027.pdf								
426	Heineberg	Drive	Colchester0028.pdf								
454	Heineberg	Drive	Colchester0000.pdf								
476	Heineberg	Drive	Colchester0000.pdf								
500	Heineberg	Drive	Colchester0029.pdf								
526	Heineberg	Drive	Colchester0030.pdf								
527	Heineberg	Drive	Colchester0031.pdf	—						—	
30	Hercules	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
40	Hercules	Drive	Colchester0000.pdf						—		
041-43	Hercules	Drive	Colchester0000.pdf						—		

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
175	Hercules	Drive	Colchester0003.pdf	1501422006	N	N	N	N	—	9/28/16	Premier
382A	Hercules	Drive	Colchester0004.pdf								
382B	Hercules	Drive	Colchester0005.pdf								
480A	Hercules	Drive	Colchester0006.pdf								
480B	Hercules	Drive	Colchester0007.pdf								
506	Hercules	Drive	Colchester0009.pdf								
525	Hercules	Drive	Colchester0010.pdf								
566	Hercules	Drive	Colchester0011.pdf								
697	Hercules	Drive	Colchester0013.pdf								
715A	Hercules	Drive	Colchester0014.pdf								
715B	Hercules	Drive	Colchester0015.pdf								
733	Hercules	Drive	Colchester0016.pdf								
784	Hercules	Drive	Colchester0017.pdf								
808	Hercules	Drive	Colchester0018.pdf								
856	Hercules	Drive	Colchester0019.pdf								
921	Hercules	Drive	Colchester0020.pdf								
948	Hercules	Drive	Colchester0021.pdf								
964	Hercules	Drive	Colchester0022.pdf								
62	Heritage	Lane	Colchester0000.pdf		N	N	N	N	—	9/27/16	
102	Heritage	Lane	Colchester0001.pdf								
163	Heritage	Lane	Colchester0002.pdf								
164	Heritage	Lane	Colchester0003.pdf								
166	Heritage	Lane	Colchester0004.pdf								
178	Heritage	Lane	Colchester0000.pdf								
207	Heritage	Lane	Colchester0006.pdf								
227	Heritage	Drive	Colchester0007.pdf								
246	Heritage	Drive	Colchester0000.pdf								
18	Hero's	View	Colchester0000.pdf		N	N	N	N	—	9/19/16	
20	Hero's	View	Colchester0000.pdf		N	N	N	N	—		
9	Hidden Oaks	Drive	Colchester0000.pdf		N	N	N	N	—	4/28/16	
10	Hidden Oaks	Drive	Colchester0001.pdf								
25	Hidden Oaks	Drive	Colchester0002.pdf								
41	Hidden Oaks	Drive	Colchester0003.pdf								
61	Hidden Oaks	Drive	Colchester0004.pdf								
76	Hidden Oaks	Drive	Colchester0005.pdf								
81	Hidden Oaks	Drive	Colchester0006.pdf								
97	Hidden Oaks	Drive	Colchester0007.pdf								
117	Hidden Oaks	Drive	Colchester0009.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
133	Hidden Oaks	Drive	Colchester0011.pdf	1501-Arrow	N	N	N	N	—	9/20/16	Premier
168	Hidden Oaks	Drive	Colchester0012.pdf								
179	Hidden Oaks	Drive	Colchester0013.pdf								
200	Hidden Oaks	Drive	Colchester0014.pdf								
213	Hidden Oaks	Drive	Colchester0015.pdf								
218	Hidden Oaks	Drive	Colchester0016.pdf								
236	Hidden Oaks	Drive	Colchester0017.pdf								
258	Hidden Oaks	Drive	Colchester0018.pdf								
275	Hidden Oaks	Drive	Colchester0019.pdf								
293	Hidden Oaks	Drive	Colchester0021.pdf								
305	Hidden Oaks	Drive	Colchester0022.pdf								
325	Hidden Oaks	Drive	Colchester0024.pdf								
336	Hidden Oaks	Drive	Colchester0025.pdf								
341	Hidden Oaks	Drive	Colchester0026.pdf								
350	Hidden Oaks	Drive	Colchester0027.pdf								
361	Hidden Oaks	Drive	Colchester0028.pdf								
362	Hidden Oaks	Drive	Colchester0029.pdf								
364	Hidden Oaks	Drive	Colchester0030.pdf								
365	Hidden Oaks	Drive	Colchester0031.pdf		↓	↓	↓	↓	↓	↓	
46	Highpoint	Center	Colchester0000.pdf		N	N	N	N	—	9/29/16	
106	Highpoint	Center	Colchester0001.pdf		N	N	N	N	—	↓	
82	Hillcrest	Lane	Colchester0000.pdf		N	N	N	N	—	9/22/16	
90	Hillcrest	Lane	Colchester0000.pdf								
93	Hillcrest	Lane	Colchester0000.pdf								
129	Hillcrest	Lane	Colchester0000.pdf								
130	Hillcrest	Lane	Colchester0000.pdf								
132	Hillcrest	Lane	Colchester0000.pdf								
42	Hillcrest	Lane	Colchester0000.pdf		↓	↓	↓	↓	↓	↓	
12	Hilltop	Court	Colchester0000.pdf		N	N	N	N	—	9/27/16	
13	Hilltop	Court	Colchester0000.pdf								
29	Hilltop	Court	Colchester0001.pdf								
30	Hilltop	Court	Colchester0000.pdf								
40	Hilltop	Court	Colchester0002.pdf								
42	Hilltop	Court	Colchester0003.pdf								
43	Hilltop	Court	Colchester0004.pdf								
75	Hilltop	Court	Colchester0005.pdf								
97	Hilltop	Court	Colchester0006.pdf								
114	Hilltop	Court	Colchester0007.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
125	Hilltop	Court	Colchester0008.pdf								
19	Holbrook	Court	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
20	Holbrook	Court	Colchester0000.pdf		N	N	N	N	—	9/22/16	
21	Holbrook	Court	Colchester0000.pdf								
22	Holbrook	Court	Colchester0000.pdf								
49	Holbrook	Court	Colchester0000.pdf								
51	Holbrook	Court	Colchester0000.pdf								
52	Holbrook	Court	Colchester0000.pdf								
54	Holbrook	Court	Colchester0000.pdf								
82	Holbrook	Court	Colchester0000.pdf								
84	Holbrook	Court	Colchester0000.pdf								
091A	Hollow Creek	Drive	Colchester0001.pdf								
091B	Hollow Creek	Drive	Colchester0002.pdf		N	N	N	N	—	9/26/16	
091C	Hollow Creek	Drive	Colchester0003.pdf								
091D	Hollow Creek	Drive	Colchester0004.pdf								
093A	Hollow Creek	Drive	Colchester0005.pdf								
093B	Hollow Creek	Drive	Colchester0006.pdf								
093C	Hollow Creek	Drive	Colchester0007.pdf								
093D	Hollow Creek	Drive	Colchester0008.pdf								
125A	Hollow Creek	Drive	Colchester0009.pdf								
125B	Hollow Creek	Drive	Colchester0010.pdf								
125C	Hollow Creek	Drive	Colchester0011.pdf								
199	Hollow Creek	Drive	Colchester0012.pdf								
199B	Hollow Creek	Drive	Colchester0000.pdf								
201	Hollow Creek	Drive	Colchester0022.pdf								
264	Hollow Creek	Drive	Colchester0023.pdf								
271A	Hollow Creek	Drive	Colchester0013.pdf								
271B	Hollow Creek	Drive	Colchester0014.pdf								
271C	Hollow Creek	Drive	Colchester0015.pdf								
271D	Hollow Creek	Drive	Colchester0016.pdf								
273A	Hollow Creek	Drive	Colchester0017.pdf								
273B	Hollow Creek	Drive	Colchester0018.pdf								
273C	Hollow Creek	Drive	Colchester0019.pdf								
273D	Hollow Creek	Drive	Colchester0020.pdf								
286A	Hollow Creek	Drive	Colchester0021.pdf								
286B	Hollow Creek	Drive	Colchester0000.pdf								
286C	Hollow Creek	Drive	Colchester0000.pdf								
286D	Hollow Creek	Drive	Colchester0001.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
51	Holy Cross	Road	Colchester0000.pdf	1501-442006	N	N	N	N	—	9/20/16	Premier
89	Holy Cross	Road	Colchester0001.pdf								
123	Holy Cross	Road	Colchester0000.pdf								
143	Holy Cross	Road	Colchester0003.pdf								
171	Holy Cross	Road	Colchester0006.pdf								
207	Holy Cross	Road	Colchester0007.pdf								
224	Holy Cross	Road	Colchester0008.pdf								
225	Holy Cross	Road	Colchester0009.pdf								
230	Holy Cross	Road	Colchester0010.pdf								
254	Holy Cross	Road	Colchester0011.pdf								
263	Holy Cross	Road	Colchester0012.pdf								
289	Holy Cross	Road	Colchester0013.pdf								
306	Holy Cross	Road	Colchester0000.pdf								
335	Holy Cross	Road	Colchester0015.pdf								
363	Holy Cross	Road	Colchester0017.pdf								
409	Holy Cross	Road	Colchester0018.pdf								
427	Holy Cross	Road	Colchester0019.pdf								
460	Holy Cross	Road	Colchester0000.pdf								
479	Holy Cross	Road	Colchester0000.pdf								
503	Holy Cross	Road	Colchester0000.pdf								
531	Holy Cross	Road	Colchester0000.pdf								
573	Holy Cross	Road	Colchester0023.pdf								
597	Holy Cross	Road	Colchester0024.pdf								
655	Holy Cross	Road	Colchester0000.pdf								
675	Holy Cross	Road	Colchester0025.pdf								
709	Holy Cross	Road	Colchester0026.pdf								
731-733	Holy Cross	Road	Colchester0027.pdf								
791	Holy Cross	Road	Colchester0028.pdf								
811	Holy Cross	Road	Colchester0000.pdf								
859	Holy Cross	Road	Colchester0029.pdf								
871	Holy Cross	Road	Colchester0030.pdf								
913	Holy Cross	Road	Colchester0031.pdf								
933	Holy Cross	Road	Colchester0000.pdf								
951	Holy Cross	Road	Colchester0032.pdf								
972	Holy Cross	Road	Colchester0033.pdf								
983	Holy Cross	Road	Colchester0034.pdf								
983	Holy Cross	Road	Colchester00340000.pdf								
11	Horizon View	Drive	Colchester0000.pdf		N	N	N	N	—	9/19/16	

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
22	Horizon View	Drive	Colchester0001.pdf	1501-42200	N	N	N	N	—	9/19/16	Premier
29	Horizon View	Drive	Colchester0002.pdf								
48	Horizon View	Drive	Colchester0003.pdf								
60	Horizon View	Drive	Colchester0004.pdf								
66	Horizon View	Drive	Colchester0000.pdf								
71	Horizon View	Drive	Colchester0005.pdf								
118	Horizon View	Drive	Colchester0006.pdf								
131	Horizon View	Drive	Colchester0007.pdf								
134	Horizon View	Drive	Colchester0008.pdf								
153	Horizon View	Drive	Colchester0009.pdf								
176	Horizon View	Drive	Colchester0000.pdf								
42	Hullcrest	Lane	Colchester0000.pdf		N	N	N	N	—	9/26/16	
88	Hummingbird	Drive	Colchester0000.pdf		N	N	N	N	—	9/24/16	
93	Hummingbird	Drive	Colchester0001.pdf								
110	Hummingbird	Drive	Colchester0002.pdf								
121	Hummingbird	Drive	Colchester0003.pdf								
126	Hummingbird	Drive	Colchester0004.pdf								
152	Hummingbird	Drive	Colchester0005.pdf								
30	Indian	Circle	Colchester0001.pdf		N	N	N	N	—	9/26/16	
42	Indian	Circle	Colchester0002.pdf								
58	Indian	Circle	Colchester0003.pdf								
97	Indian	Circle	Colchester0004.pdf								
100A	Indian	Circle	Colchester0005.pdf								
100B	Indian	Circle	Colchester0006.pdf								
125A	Indian	Circle	Colchester0007.pdf								
125B	Indian	Circle	Colchester0008.pdf								
128A	Indian	Circle	Colchester0009.pdf								
128B	Indian	Circle	Colchester0000.pdf								
23	Ira Allen	Court	Colchester0000.pdf		N	N	N	N	—	9/22/16	
32	Ira Allen	Court	Colchester0000.pdf								
43	Ira Allen	Court	Colchester0000.pdf								
61	Ira Allen	Court	Colchester0001.pdf								
88	Ira Allen	Court	Colchester0000.pdf								
111	Ira Allen	Court	Colchester0002.pdf								
119	Ira Allen	Court	Colchester0003.pdf								
125	Ira Allen	Court	Colchester0004.pdf								
137	Ira Allen	Court	Colchester0005.pdf								
146	Ira Allen	Court	Colchester0006.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
148	Ira Allen	Court	Colchester0000.pdf	1501-Arroo6	N	N	N	N	—	9/22/16	Premier
150	Ira Allen	Court	Colchester0007.pdf		N	N	N	N	—	↓	
61	Jakes	Place	Colchester0000.pdf		N	N	N	N		9/22/16	
37	Jakes	Place	Colchester0000.pdf		N	N	N	N		↓	
39	James	Way	Colchester0000.pdf		N	N	N	N	—	9/21/16	
24	Jason	Drive	Colchester0001.pdf		N	N	N	N	—	9/21/16	
51	Jason	Drive	Colchester0003.pdf								
60	Jason	Drive	Colchester0004.pdf								
71	Jason	Drive	Colchester0005.pdf								
100	Jason	Drive	Colchester0006.pdf								
126	Jason	Drive	Colchester0007.pdf		↓	↓	↓	↓	↓		
14	Jefferey	Drive	Colchester0000.pdf		N	N	N	N	~~—~~		
19	Jefferey	Drive	Colchester0000.pdf								
42	Jefferey	Drive	Colchester0001.pdf								
55	Jefferey	Drive	Colchester0003.pdf								
81	Jefferey	Drive	Colchester0004.pdf								
96	Jefferey	Drive	Colchester0005.pdf								
122	Jefferey	Drive	Colchester0007.pdf								
148	Jefferey	Drive	Colchester0008.pdf		↓	↓	↓	↓	↓	↓	
20A	Jefferson	Drive	Colchester0000.pdf		N	N	N	N	—	9/29/16	
20B	Jefferson	Drive	Colchester0001.pdf						—		
20C	Jefferson	Drive	Colchester0002.pdf						—		
27	Jefferson	Drive	Colchester0003.pdf						—		
28	Jefferson	Drive	Colchester0004.pdf		↓	↓	↓	↓	—	↓	
9	Jen	Barry	Lane	Colchester.pdf	N	N	N	N	—	9/20/16	
30	Jimmo	Drive	Colchester0000.pdf		N	N	N	N	—		
136	Jimmo	Drive	Colchester0001.pdf								
136	Jimmo	Drive	Colchester0000.pdf								
162	Jimmo	Drive	Colchester0002.pdf								
162	Jimmo	Drive	Colchester0000.pdf		↓	↓	↓	↓	↓		
19	Jocelyn	Court	Colchester0001.pdf		N	N	N	N	—	9/27/16	
36	Jocelyn	Court	Colchester0002.pdf								
37	Jocelyn	Court	Colchester0003.pdf								
53	Jocelyn	Court	Colchester0004.pdf								
58	Jocelyn	Court	Colchester0005.pdf								
63	Jocelyn	Court	Colchester0006.pdf								
70	Jocelyn	Court	Colchester0007.pdf								
1	Jocelyn	Court	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
43	Joey	Drive	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/26/16	Premier
64	Joey	Drive	Colchester0001.pdf								
65	Joey	Drive	Colchester0002.pdf								
78	Joey	Drive	Colchester0003.pdf								
86	Joey	Drive	Colchester0004.pdf								
89	Joey	Drive	Colchester0005.pdf								
100	Joey	Drive	Colchester0006.pdf								
114	Joey	Drive	Colchester0007.pdf								
123	Joey	Drive	Colchester0008.pdf								
134	Joey	Drive	Colchester0000.pdf								
140	Joey	Drive	Colchester0009.pdf								
142	Joey	Drive	Colchester0000.pdf								
152	Joey	Drive	Colchester0000.pdf								
160	Joey	Drive	Colchester0010.pdf								
172	Joey	Drive	Colchester0011.pdf								
175	Joey	Drive	Colchester0012.pdf								
186	Joey	Drive	Colchester0013.pdf								
189	Joey	Drive	Colchester0014.pdf								
202	Joey	Drive	Colchester0015.pdf								
205	Joey	Drive	Colchester0016.pdf								
218	Joey	Drive	Colchester0017.pdf								
229	Joey	Drive	Colchester0000.pdf								
4	Johnson	Avenue	Colchester.pdf		N	N	N	N	—	9/26/16	
11	Johnson	Avenue	Colchester0000.pdf								
12	Johnson	Avenue	Colchester0004.pdf								
29	Johnson	Avenue	Colchester.pdf								
53	Johnson	Avenue	Colchester.pdf								
069A	Johnson	Avenue	Colchester.pdf								
069B	Johnson	Avenue	Colchester.pdf								
169	Johnson	Avenue	Colchester0000.pdf								
174	Johnson	Avenue	Colchester0000.pdf								
192	Johnson	Avenue	Colchester00130000.pdf								
206	Johnson	Avenue	Colchester.pdf								
12	Julie	Drive	Colchester0000.pdf		N	N	N	N	—	9/26/16	
29	Julie	Drive	Colchester0001.pdf								
38	Julie	Drive	Colchester0002.pdf								
51	Julie	Drive	Colchester0003.pdf								
62	Julie	Drive	Colchester0004.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
77	Julie	Drive	Colchester0005.pdf	1501-442006	N	N	N	N	—	5/16/16	Premier
95	Julie	Drive	Colchester0006.pdf								
108	Julie	Drive	Colchester0007.pdf								
139	Julie	Drive	Colchester0008.pdf	Colchester0008.pdf							
139	Julie	Drive	Colchester0000.pdf	Colchester0000.pdf							
144	Julie	Drive	Colchester0009.pdf								
173	Julie	Drive	Colchester0010.pdf								
173	Julie	Drive	Colchester0000.pdf								
209	Julie	Drive	Colchester0011.pdf								
209	Julie	Drive	Colchester0000.pdf								
212	Julie	Drive	Colchester0013.pdf								
214	Julie	Drive	Colchester0012.pdf								
235	Julie	Drive	Colchester0014.pdf								
246	Julie	Drive	Colchester0015.pdf								
246	Julie	Drive	Colchester0000.pdf								
249	Julie	Drive	Colchester0016.pdf								
249	Julie	Drive	Colchester0000.pdf								
289	Julie	Drive	Colchester0017.pdf								
289	Julie	Drive	Colchester0000.pdf								
296	Julie	Drive	Colchester0018.pdf								
296	Julie	Drive	Colchester0000.pdf								
324	Julie	Drive	Colchester0019.pdf								
324	Julie	Drive	Colchester0000.pdf								
350	Julie	Drive	Colchester0020.pdf								
350	Julie	Drive	Colchester0000.pdf								
374	Julie	Drive	Colchester0021.pdf								
374	Julie	Drive	Colchester0000.pdf								
388	Julie	Drive	Colchester0022.pdf								
388	Julie	Drive	Colchester0000.pdf								
10	Justin Morgan	Drive	Colchester0000.pdf	—	N	N	N	N	—	9/26/16	
11	Justin Morgan	Drive	Colchester0002.pdf								
12	Justin Morgan	Drive	Colchester0004.pdf								
13	Justin Morgan	Drive	Colchester0005.pdf								
14	Justin Morgan	Drive	Colchester0007.pdf								
15	Justin Morgan	Drive	Colchester0009.pdf								
70	Justin Morgan	Drive	Colchester0012.pdf								
102	Justin Morgan	Drive	Colchester0014.pdf								
111	Justin Morgan	Drive	Colchester0016.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
122	Justin Morgan	Drive	Colchester0018.pdf	1501-422006	N	N	N	N	—	9/26/16	Premier
129	Justin Morgan	Drive	Colchester0020.pdf								
168	Justin Morgan	Drive	Colchester0023.pdf								
190	Justin Morgan	Drive	Colchester0025.pdf								
220	Justin Morgan	Drive	Colchester0027.pdf								
236	Justin Morgan	Drive	Colchester0029.pdf								
274	Justin Morgan	Drive	Colchester0031.pdf								
287	Justin Morgan	Drive	Colchester0033.pdf								
299	Justin Morgan	Drive	Colchester0035.pdf								
313	Justin Morgan	Drive	Colchester0036.pdf								
326	Justin Morgan	Drive	Colchester0038.pdf								
327	Justin Morgan	Drive	Colchester0040.pdf								
335	Justin Morgan	Drive	Colchester0042.pdf								
347	Justin Morgan	Drive	Colchester0044.pdf								
353	Justin Morgan	Drive	Colchester0046.pdf								
368	Justin Morgan	Drive	Colchester0048.pdf								
373	Justin Morgan	Drive	Colchester0050.pdf								
384	Justin Morgan	Drive	Colchester0052.pdf								
389	Justin Morgan	Drive	Colchester0054.pdf								
405	Justin Morgan	Drive	Colchester0055.pdf								
410	Justin Morgan	Drive	Colchester0057.pdf								
421	Justin Morgan	Drive	Colchester0059.pdf								
428	Justin Morgan	Drive	Colchester0061.pdf								
437	Justin Morgan	Drive	Colchester0063.pdf								
442	Justin Morgan	Drive	Colchester0065.pdf								
456	Justin Morgan	Drive	Colchester0067.pdf								
466	Justin Morgan	Drive	Colchester0069.pdf								
482	Justin Morgan	Drive	Colchester0071.pdf								
496	Justin Morgan	Drive	Colchester0073.pdf								
501	Justin Morgan	Drive	Colchester0075.pdf								
60	Kathleen	Lane	Colchester0000.pdf		N	N	N	N	—	9/27/16	
68	Kathleen	Lane	Colchester0000.pdf						—		
94	Kathleen	Lane	Colchester0000.pdf						—		
	Kathleen	Lane	Colchester0000.pdf						—		
	Kathleen	Lane	Colchester0000.pdf						—		
	Kellog	Raod	Colchester0000.pdf		N	N	N	N	—	7/20/16	
70	King	Street	Colchester0000.pdf		N	N	N	N	—	4/29/16	
76	King	Street	Colchester0002.pdf		N	N	N	N	—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
42	Kylie's	Way	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/23/16	Premier
52	Kylie's	Way	Colchester0001.pdf								
75	Kylie's	Way	Colchester0002.pdf								
114	Kylie's	Way	Colchester0003.pdf								
115	Kylie's	Way	Colchester0004.pdf								
214	Kylie's	Way	Colchester0005.pdf								
217	Kylie's	Way	Colchester0006.pdf								
224	Kylie's	Way	Colchester0007.pdf								
240	Kylie's	Way	Colchester0008.pdf								
275	Kylie's	Way	Colchester0009.pdf								
278	Kylie's	Way	Colchester0010.pdf								
	Laker	Lane	Colchester0000.pdf		N	N	N	N	—	9/24/16	
	Laker	Lane	Colchester0001.pdf		N	N	N	N	—		
34	Lakewood	Court	Colchester0000.pdf		N	N	N	N	—	9/20/16	
37	Lakewood	Court	Colchester0000.pdf						—		
55	Lakewood	Court	Colchester0001.pdf						—		
65	Lakewood	Court	Colchester0002.pdf						—		
66	Lakewood	Court	Colchester0000.pdf						—		
64	Landing	Avenue	Colchester0000.pdf		N	N	N	N	—	9/19/16	
82	Landing	Avenue	Colchester0000.pdf								
83	Landing	Avenue	Colchester0001.pdf								
101	Landing	Avenue	Colchester0002.pdf								
102	Landing	Avenue	Colchester0003.pdf								
121	Landing	Avenue	Colchester0004.pdf								
24	Laura	Lane	Colchester0000.pdf		N	N	N	N	—	9/26/16	
35	Laura	Lane	Colchester0001.pdf						—		
42	Laura	Lane	Colchester0002.pdf						—		
46	Laura	Lane	Colchester0003.pdf						—		
39	Lavigne	Road	Colchester0000.pdf		N	N	N	N	—	9/22/16	
141	Lavigne	Road	Colchester0001.pdf								
209	Lavigne	Road	Colchester0002.pdf								
219	Lavigne	Road	Colchester0003.pdf								
224	Lavigne	Road	Colchester0004.pdf								
277	Lavigne	Road	Colchester0005.pdf								
277	Lavigne	Road	Colchester0005.pdf								
287	Lavigne	Road	Colchester0006.pdf								
93	Lavigne	Road	Colchester0000.pdf								
12	Lawrence J	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
19	Lawrence J	Drive	Colchester0001.pdf	1501-422006	N	N	N	N	~~[illegible]~~	[illegible]/16	Premier
41	Lawrence J	Drive	Colchester0002.pdf						—		
52	Lawrence J	Drive	Colchester0003.pdf								
56	Lawrence J	Drive	Colchester0004.pdf								
54	Leclaire	Drive	Colchester0001.pdf		N	N	N	N			
77	Leclaire	Drive	Colchester0002.pdf								
84	Leclaire	Drive	Colchester0003.pdf								
101	Leclaire	Drive	Colchester0004.pdf								
106	Leclaire	Drive	Colchester0000.pdf								
125	Leclaire	Drive	Colchester0005.pdf								
126	Leclaire	Drive	Colchester0006.pdf								
145	Leclaire	Drive	Colchester0007.pdf								
150	Leclaire	Drive	Colchester0008.pdf								
165	Leclaire	Drive	Colchester0009.pdf								
166	Leclaire	Drive	Colchester0000.pdf								
189	Leclaire	Drive	Colchester0010.pdf								
33	Ledge	Road	Colchester0000.pdf		N	N	N	N	—	9/22/16	
95	Ledge	Road	Colchester0000.pdf						—		
14	Leoray	Court	Colchester0000.pdf		N	N	N	N	—	9/26/16	
15	Lesage	Lane	Colchester0000.pdf		N	N	N	N	—	9/26/16	
43	Liberty	Lane	Colchester0000.pdf		N	N	N	N	—	9/28/16	
44	Liberty	Lane	Colchester0001.pdf								
80	Liberty	Lane	Colchester0003.pdf								
94	Liberty	Lane	Colchester0004.pdf								
99	Liberty	Lane	Colchester0005.pdf								
110	Liberty	Lane	Colchester0006.pdf								
124	Liberty	Lane	Colchester0007.pdf								
144	Liberty	Lane	Colchester0008.pdf								
156	Liberty	Lane	Colchester0009.pdf								
196	Liberty	Lane	Colchester0010.pdf								
213	Liberty	Lane	Colchester0011.pdf								
218	Liberty	Lane	Colchester0012.pdf								
23	Lilac	Street	Colchester0000.pdf		N	N	N	N	—	9/21/16	
118	Lily	Lane	Colchester0000.pdf		N	N	N	N	—	9/27/16	
13	Lily	Lane	Colchester0000.pdf								
14	Lily	Lane	Colchester.pdf								
31	Lily	Lane	Colchester0000.pdf								
38	Lily	Lane	Colchester0000.pdf								

Double
Check
This
(?)

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
49	Lily	Lane	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
71	Lily	Lane	Colchester0000.pdf						—		
76	Lily	Lane	Colchester0000.pdf						—		
96	Lily	Lane	Colchester0000.pdf						—		
19	Lime Kiln	Road	Colchester0000.pdf						—		
35	Lime Kiln	Road	Colchester0001.pdf		N	N	N	N	—	9/29/16	
15	Lincoln	Drive	Colchester0000.pdf		N	N	N	N	—		
35	Lincoln	Drive	Colchester0001.pdf		N	N	N	N	—	9/29/16	
053A	Lincoln	Drive	Colchester0002.pdf								
053B	Lincoln	Drive	Colchester0003.pdf								
053C	Lincoln	Drive	Colchester0004.pdf								
97	Lincoln	Drive	Colchester0005.pdf								
098A	Lincoln	Drive	Colchester0006.pdf								
098B	Lincoln	Drive	Colchester0007.pdf								
098C	Lincoln	Drive	Colchester0008.pdf								
105	Lincoln	Drive	Colchester0009.pdf								
25	Lindale	Drive	Colchester0001.pdf		N	N	N	N	—	9/27/16	
57	Lindale	Drive	Colchester0002.pdf								
78	Lindale	Drive	Colchester0003.pdf								
85	Lindale	Drive	Colchester0004.pdf								
113	Lindale	Drive	Colchester0005.pdf								
122	Lindale	Drive	Colchester0006.pdf								
146	Lindale	Drive	Colchester0007.pdf								
155	Lindale	Drive	Colchester0008.pdf								
164	Lindale	Drive	Colchester0009.pdf								
179	Lindale	Drive	Colchester0000.pdf								
182	Lindale	Drive	Colchester0010.pdf								
199	Lindale	Drive	Colchester0011.pdf								
204	Lindale	Drive	Colchester0012.pdf								
218	Lindale	Drive	Colchester0013.pdf								
221	Lindale	Drive	Colchester0014.pdf								
243	Lindale	Drive	Colchester0015.pdf								
14	Logan	Drive	Colchester0000.pdf		N	N	N	N	—	9/27/16	
21	Logan	Drive	Colchester0000.pdf								
37	Logan	Drive	Colchester0001.pdf								
2	Logan	Drive	Colchester0002.pdf								
3	Logan	Drive	Colchester0003.pdf								
4	Logan	Drive	Colchester0004.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
56	Logistics	Road	Colchester0000.pdf	1501-422006	~~N~~	~~N~~	~~N~~	~~N~~	CUST DENIED ACCESS	9/29/16	Premier
181	Logistics	Road	Colchester0000.pdf	see next page	~~N~~	~~N~~	~~N~~	~~N~~	↓	↓	↓
191	Logistics	Road	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
15	Lone Birch	Street	Colchester0000.pdf	↓	N	N	N	N	—	9/26/16	↓
18	Lone Birch	Street	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
24	Lone Birch	Street	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
29	Lone Birch	Street	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
34	Lone Birch	Street	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
37	Lone Birch	Street	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
39	Lone Birch	Street	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
46	Lone Birch	Street	Colchester0007.pdf	↓	↓	↓	↓	↓	↓	↓	↓
53	Lone Birch	Street	Colchester0009.pdf	↓	↓	↓	↓	↓	↓	↓	↓
54	Lone Birch	Street	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
57	Lone Birch	Street	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
70	Longmeadow		Colchester0001.pdf	↓	N	N	N	N	—	9/19/16	↓
106	Longmeadow		Colchester0002.pdf	↓	↓	↓	↓	↓	—	↓	↓
118	Longmeadow		Colchester0003.pdf	↓	↓	↓	↓	↓	—	↓	↓
146	Longmeadow		Colchester0004.pdf	↓	↓	↓	↓	↓	—	↓	↓
Garage	Longmeadow		Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
20	Longwood	Circle	Colchester0000.pdf	↓	N	N	N	N	—	9/29/16	↓
21	Longwood	Circle	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
44	Longwood	Circle	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
49	Longwood	Circle	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
54	Longwood	Circle	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
55	Longwood	Circle	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
18	Lower Mountain	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/28/16	↓
38	Lower Mountain	Road	Colchester0010.pdf	↓	↓	↓	↓	↓	↓	↓	↓
39	Lower Mountain	Road	Colchester0012.pdf	↓	↓	↓	↓	↓	↓	↓	↓
42	Lower Mountain	Road	Colchester0011.pdf	↓	↓	↓	↓	↓	↓	↓	↓
215	Lower Mountain	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
218	Lower Mountain	Road	Colchester0017.pdf	↓	↓	↓	↓	↓	↓	↓	↓
001-2-3-4	Lupine	Drive	Colchester0000.pdf	↓	N	N	N	N	—	9/21/16	↓
137	Lupine	Drive	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
163	Lupine	Drive	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
179	Lupine	Drive	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
197	Lupine	Drive	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
220	Lupine	Drive	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
230	Lupine	Drive	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
56	Logistics	Road	Colchester0000.pdf	~~1501-422006~~ 1442	N	N	N	N	N/A	11-8-16	420
181	Logistics	Road	Colchester0000.pdf								
191	Logistics	Road	Colchester0000.pdf								
15	Lone Birch	Street	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/26/16	
18	Lone Birch	Street	Colchester0001.pdf								
24	Lone Birch	Street	Colchester0002.pdf								
29	Lone Birch	Street	Colchester0003.pdf								
34	Lone Birch	Street	Colchester0004.pdf								
37	Lone Birch	Street	Colchester0005.pdf								
39	Lone Birch	Street	Colchester0006.pdf								
46	Lone Birch	Street	Colchester0007.pdf								
53	Lone Birch	Street	Colchester0009.pdf								
54	Lone Birch	Street	Colchester0008.pdf								
57	Lone Birch	Street	Colchester0000.pdf								
70	Longmeadow		Colchester0001.pdf		N	N	N	N	—	9/19/16	
106	Longmeadow		Colchester0002.pdf						—		
118	Longmeadow		Colchester0003.pdf						—		
146	Longmeadow		Colchester0004.pdf						—		
Garage	Longmeadow		Colchester0000.pdf						—		
20	Longwood	Circle	Colchester0000.pdf		N	N	N	N	—	9/19/16	
21	Longwood	Circle	Colchester0000.pdf								
44	Longwood	Circle	Colchester0002.pdf								
49	Longwood	Circle	Colchester0003.pdf								
54	Longwood	Circle	Colchester0004.pdf								
55	Longwood	Circle	Colchester0005.pdf								
18	Lower Mountain	Road	Colchester0000.pdf		N	N	N	N	—	9/20/16	
38	Lower Mountain	Road	Colchester0010.pdf								
39	Lower Mountain	Road	Colchester0012.pdf								
42	Lower Mountain	Road	Colchester0011.pdf								
215	Lower Mountain	Road	Colchester0000.pdf								
218	Lower Mountain	Road	Colchester0017.pdf								
001-2-3-4	Lupine	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
137	Lupine	Drive	Colchester0002.pdf								
163	Lupine	Drive	Colchester0001.pdf								
179	Lupine	Drive	Colchester0003.pdf								
197	Lupine	Drive	Colchester0004.pdf								
220	Lupine	Drive	Colchester0005.pdf								
230	Lupine	Drive	Colchester0006.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
25	Macrae	Road	Colchester0000.pdf	1501-4M2006	N	N	N	N	—	9/22/16	Premier
48	Macrae	Road	Colchester0000.pdf								
66	Macrae	Road	Colchester0002.pdf								
73	Macrae	Road	Colchester0003.pdf								
98	Macrae	Road	Colchester0000.pdf								
101	Macrae	Road	Colchester0004.pdf								
124	Macrae	Road	Colchester0000.pdf								
142	Macrae	Road	Colchester0005.pdf								
167	Macrae	Road	Colchester0000.pdf								
168	Macrae	Road	Colchester0006.pdf								
194	Macrae	Road	Colchester0007.pdf								
221-223	Macrae	Road	Colchester0008.pdf								
224	Macrae	Road	Colchester0009.pdf								
284	Macrae	Road	Colchester0010.pdf								
297	Macrae	Road	Colchester0000.pdf								
302	Macrae	Road	Colchester0011.pdf								
323	Macrae	Road	Colchester0000.pdf								
325	Macrae	Road	Colchester0000.pdf								
353-355	Macrae	Road	Colchester0012.pdf								
430	Macrae	Road	Colchester0000.pdf								
450	Macrae	Road	Colchester0013.pdf								
454	Macrae	Road	Colchester0014.pdf								
492	Macrae	Road	Colchester0015.pdf								
500	Macrae	Road	Colchester0000.pdf								
576	Macrae	Road	Colchester0016.pdf								
608	Macrae	Road	Colchester0000.pdf								
614	Macrae	Road	Colchester0017.pdf								
0063-69	Main	Street	Colchester0000.pdf		N	N	N	N	—	9/27/16	
116	Main	Street	Colchester0001.pdf								
164	Main	Street	Colchester0002.pdf								
0187A	Main	Street	Colchester0003.pdf								
0187B	Main	Street	Colchester0004.pdf								
0187C	Main	Street	Colchester0000.pdf								
0187D	Main	Street	Colchester0006.pdf								
0187E	Main	Street	Colchester0007.pdf								
0187F	Main	Street	Colchester0008.pdf								
0187G	Main	Street	Colchester0009.pdf								
0187H	Main	Street	Colchester0010.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
0187I	Main	Street	Colchester0011.pdf	1501-422006	N	N	N	N	—	5/27/16	Premier
0187J	Main	Street	Colchester0012.pdf								
0187K	Main	Street	Colchester0013.pdf								
0187L	Main	Street	Colchester0014.pdf								
0187M	Main	Street	Colchester0015.pdf								
0187N	Main	Street	Colchester0016.pdf								
0187O	Main	Street	Colchester0017.pdf								
0187P	Main	Street	Colchester0018.pdf								
0187Q	Main	Street	Colchester0019.pdf								
0187R	Main	Street	Colchester0020.pdf								
0187S	Main	Street	Colchester0021.pdf								
0187T	Main	Street	Colchester0022.pdf								
0187U	Main	Street	Colchester0000.pdf								
0187V	Main	Street	Colchester0024.pdf								
0187W	Main	Street	Colchester0025.pdf								
0187X	Main	Street	Colchester0026.pdf								
0187Y	Main	Street	Colchester0027.pdf								
0187Z	Main	Street	Colchester0028.pdf								
0187ZA	Main	Street	Colchester0000.pdf								
0187ZB	Main	Street	Colchester0000.pdf								
0187ZC	Main	Street	Colchester0000.pdf								
188	Main	Street	Colchester0030.pdf								
0202-204	Main	Street	Colchester0032.pdf								
220	Main	Street	Colchester0000.pdf								
222	Main	Street	Colchester0000.pdf								
231	Main	Street	Colchester0034.pdf								
233	Main	Street	Colchester0000.pdf								
250	Main	Street	Colchester0000.pdf								
253	Main	Street	Colchester0001.pdf								
342	Main	Street	Colchester0000.pdf								
344	Main	Street	Colchester0000.pdf								
356	Main	Street	Colchester0000.pdf								
358	Main	Street	Colchester0000.pdf								
366	Main	Street	Colchester0010.pdf								
374	Main	Street	Colchester0011.pdf								
375	Main	Street	Colchester0012.pdf								
391	Main	Street	Colchester0000.pdf								
404	Main	Street	Colchester0014.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
419	Main	Street	Colchester0015.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
465	Main	Street	Colchester0017.pdf								
470	Main	Street	Colchester0018.pdf								
483	Main	Street	Colchester0019.pdf								
488	Main	Street	Colchester0020.pdf								
508	Main	Street	Colchester0021.pdf								
521	Main	Street	Colchester0022.pdf								
531	Main	Street	Colchester0000.pdf								
532	Main	Street	Colchester0023.pdf								
541	Main	Street	Colchester0000.pdf								
544	Main	Street	Colchester0025.pdf								
567	Main	Street	Colchester0026.pdf								
568	Main	Street	Colchester0027.pdf								
570	Main	Street	Colchester0000.pdf								
587	Main	Street	Colchester0028.pdf								
594	Main	Street	Colchester0029.pdf								
604	Main	Street	Colchester0000.pdf								
610	Main	Street	Colchester0031.pdf								
626	Main	Street	Colchester0032.pdf								
649	Main	Street	Colchester0033.pdf								
658	Main	Street	Colchester0034.pdf								
680	Main	Street	Colchester0035.pdf								
718	Main	Street	Colchester0037.pdf								
721	Main	Street	Colchester0036.pdf								
740	Main	Street	Colchester.pdf								
741	Main	Street	Colchester0038.pdf								
751	Main	Street	Colchester0039.pdf								
783	Main	Street	Colchester0040.pdf								
784	Main	Street	Colchester0041.pdf								
800	Main	Street	Colchester0042.pdf								
801	Main	Street	Colchester0043.pdf								
823	Main	Street	Colchester0044.pdf								
828	Main	Street	Colchester0045.pdf								
830	Main	Street	Colchester0049.pdf								
851	Main	Street	Colchester0046.pdf								
873	Main	Street	Colchester0047.pdf								
893	Main	Street	Colchester0048.pdf								
899	Main	Street	Colchester0050.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
900	Main	Street	Colchester0051.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
935	Main	Street	Colchester.pdf								
960	Main	Street	Colchester0053.pdf								
965	Main	Street	Colchester0054.pdf								
984	Main	Street	Colchester0055.pdf								
0987-989	Main	Street	Colchester0056.pdf								
1005	Main	Street	Colchester0057.pdf								
1015	Main	Street	Colchester0058.pdf								
1016	Main	Street	Colchester0059.pdf								
1028	Main	Street	Colchester0060.pdf								
1035	Main	Street	Colchester0061.pdf								
1050	Main	Street	Colchester0062.pdf								
1055	Main	Street	Colchester0063.pdf								
1074	Main	Street	Colchester0064.pdf								
1097	Main	Street	Colchester0000.pdf								
1119	Main	Street	Colchester0000.pdf								
1136	Main	Street	Colchester0065.pdf								
1178	Main	Street	Colchester0000.pdf								
1204	Main	Street	Colchester0000.pdf								
1228	Main	Street	Colchester0067.pdf								
1448	Main	Street	Colchester0069.pdf								
1474	Main	Street	Colchester0070.pdf								
1492	Main	Street	Colchester0071.pdf								
1514	Main	Street	Colchester0072.pdf								
1546	Main	Street	Colchester0073.pdf								
1662	Main	Street	Colchester0000.pdf								
1662	Main	Street	Colchester0000.pdf								
1701	Main	Street	Colchester0000.pdf								
1702	Main	Street	Colchester0075.pdf								
1733	Main	Street	Colchester0076.pdf								
1767	Main	Street	Colchester0000.pdf								
1795	Main	Street	Colchester0077.pdf								
1815	Main	Street	Colchester0078.pdf								
1847	Main	Street	Colchester0079.pdf								
1865	Main	Street	Colchester0080.pdf								
1921	Main	Street	Colchester0081.pdf								
1945A	Main	Street	Colchester0000.pdf								
1945B	Main	Street	Colchester0000.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
1945C	Main	Street	Colchester0000.pdf	1501-A4006	N	N	N	N	—	9/20/16	Premier
1986	Main	Street	Colchester0083.pdf								
2029	Main	Street	Colchester0086.pdf								
2061	Main	Street	Colchester0088.pdf								
2091	Main	Street	Colchester0000.pdf								
2091	Main	Street	Colchester0000.pdf								
2093	Main	Street	Colchester0000.pdf								
2100	Main	Street	Colchester0090.pdf								
2163	Main	Street	Colchester0000.pdf								
2249	Main	Street	Colchester0091.pdf								
2285	Main	Street	Colchester0092.pdf								
2306	Main	Street	Colchester0093.pdf								
2309	Main	Street	Colchester0000.pdf								
2321	Main	Street	Colchester0000.pdf								
2330	Main	Street	Colchester0095.pdf								
2363	Main	Street	Colchester0096.pdf								
2367	Main	Street	Colchester0097.pdf								
2388	Main	Street	Colchester0098.pdf								
2397	Main	Street	Colchester0099.pdf								
2416	Main	Street	Colchester0100.pdf								
15	Mallard	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
31	Mallard	Drive	Colchester0000.pdf								
51	Mallard	Drive	Colchester0000.pdf								
67	Mallard	Drive	Colchester0000.pdf								
95	Mallard	Drive	Colchester0001.pdf								
102	Mallard	Drive	Colchester0000.pdf								
114	Mallard	Drive	Colchester0002.pdf								
136	Mallard	Drive	Colchester0000.pdf								
138	Mallard	Drive	Colchester0000.pdf								
149	Mallard	Drive	Colchester0004.pdf								
238	Mallard	Drive	Colchester0000.pdf								
254	Mallard	Drive	Colchester0005.pdf								
257	Mallard	Drive	Colchester0000.pdf								
306	Mallard	Drive	Colchester0000.pdf								
319	Mallard	Drive	Colchester0000.pdf								
340	Mallard	Drive	Colchester0000.pdf								
363	Mallard	Drive	Colchester0000.pdf								
368	Mallard	Drive	Colchester0000.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
385	Mallard	Drive	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/21/16	Premier
271	Malletts Bay	Avenue	Colchester0000.pdf		N	N	N	N	—	9/27/16	
300	Malletts Bay	Avenue	Colchester0000.pdf								
352	Malletts Bay	Avenue	Colchester0000.pdf								
384	Malletts Bay	Avenue	Colchester0000.pdf								
409	Malletts Bay	Avenue	Colchester0001.pdf								
422	Malletts Bay	Avenue	Colchester0000.pdf								
497	Malletts Bay	Avenue	Colchester0003.pdf								
521	Malletts Bay	Avenue	Colchester0004.pdf								
524	Malletts Bay	Avenue	Colchester0005.pdf								
556	Malletts Bay	Avenue	Colchester0006.pdf								
559	Malletts Bay	Avenue	Colchester0007.pdf								
658	Malletts Bay	Avenue	Colchester0008.pdf								
682	Malletts Bay	Avenue	Colchester0009.pdf								
732	Malletts Bay	Avenue	Colchester0010.pdf								
735	Malletts Bay	Avenue	Colchester0000.pdf								
742	Malletts Bay	Avenue	Colchester0012.pdf								
764	Malletts Bay	Avenue	Colchester0013.pdf								
787	Malletts Bay	Avenue	Colchester0014.pdf								
823	Malletts Bay	Avenue	Colchester0015.pdf								
844	Malletts Bay	Avenue	Colchester0000.pdf								
1635	Malletts Bay	Avenue	Colchester0016.pdf								
1729	Malletts Bay	Avenue	Colchester0017.pdf								
1861	Malletts Bay	Avenue	Colchester0000.pdf								
1939	Malletts Bay	Avenue	Colchester.pdf								
1995	Malletts Bay	Avenue	Colchester0018.pdf								
2133	Malletts Bay	Avenue	Colchester0000.pdf								
2178	Malletts Bay	Avenue	Colchester0000.pdf								
2230	Malletts Bay	Avenue	Colchester0000.pdf								
2256	Malletts Bay	Avenue	Colchester0000.pdf								
2274	Malletts Bay	Avenue	Colchester0000.pdf								
2334	Malletts Bay	Avenue	Colchester0000.pdf								
2374	Malletts Bay	Avenue	Colchester0001.pdf								
2385	Malletts Bay	Avenue	Colchester0000.pdf								
2423	Malletts Bay	Avenue	Colchester0000.pdf								
2432	Malletts Bay	Avenue	Colchester0000.pdf								
2462	Malletts Bay	Avenue	Colchester0019.pdf								
2467	Malletts Bay	Avenue	Colchester0020.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
2479	Malletts Bay	Avenue	Colchester0022.pdf	1501-442006	N	N	N	N	—	4/20/16	Premier
2479	Malletts Bay	Avenue	Colchester0023.pdf								
2519	Malletts Bay	Avenue	Colchester0024.pdf								
2520	Malletts Bay	Avenue	Colchester0025.pdf								
2537	Malletts Bay	Avenue	Colchester0026.pdf								
2540	Malletts Bay	Avenue	Colchester0027.pdf								
2552	Malletts Bay	Avenue	Colchester0028.pdf								
2553	Malletts Bay	Avenue	Colchester0000.pdf								
2576	Malletts Bay	Avenue	Colchester0029.pdf								
2594	Malletts Bay	Avenue	Colchester0030.pdf								
2608	Malletts Bay	Avenue	Colchester0031.pdf								
2617	Malletts Bay	Avenue	Colchester0032.pdf								
2642	Malletts Bay	Avenue	Colchester0033.pdf								
2645	Malletts Bay	Avenue	Colchester0034.pdf								
2670A	Malletts Bay	Avenue	Colchester0035.pdf								
2670B	Malletts Bay	Avenue	Colchester0036.pdf								
2673	Malletts Bay	Avenue	Colchester0037.pdf								
2688	Malletts Bay	Avenue	Colchester0038.pdf								
2689	Malletts Bay	Avenue	Colchester0040.pdf								
2709	Malletts Bay	Avenue	Colchester0041.pdf								
2720	Malletts Bay	Avenue	Colchester0000.pdf								
2737	Malletts Bay	Avenue	Colchester0042.pdf								
2751	Malletts Bay	Avenue	Colchester0043.pdf								
2758	Malletts Bay	Avenue	Colchester0044.pdf								
2770	Malletts Bay	Avenue	Colchester0045.pdf								
2787	Malletts Bay	Avenue	Colchester0046.pdf								
2797	Malletts Bay	Avenue	Colchester0047.pdf								
2802	Malletts Bay	Avenue	Colchester0048.pdf								
2824	Malletts Bay	Avenue	Colchester0049.pdf								
2825	Malletts Bay	Avenue	Colchester0000.pdf								
2834	Malletts Bay	Avenue	Colchester0051.pdf								
2864	Malletts Bay	Avenue	Colchester0052.pdf								
2885	Malletts Bay	Avenue	Colchester0053.pdf								
2897	Malletts Bay	Avenue	Colchester0054.pdf								
88	Malletts Bay	Avenue	Campground	Road0001.pdf							
41	Maple Ridge	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
83	Maple Ridge	Drive	Colchester0000.pdf						—		
95	Maple Ridge	Drive	Colchester0000.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
97	Maple Ridge	Drive	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/21/16	Premier
024-26	Marble Island	Road	Colchester0000.pdf		N	N	N	N	—	9/21/16	
054-56	Marble Island	Road	Colchester0001.pdf								
72	Marble Island	Road	Colchester0002.pdf								
98	Marble Island	Road	Colchester0004.pdf								
120	Marble Island	Road	Colchester0005.pdf								
136	Marble Island	Road	Colchester0006.pdf								
139	Marble Island	Road	Colchester0000.pdf								
147	Marble Island	Road	Colchester0008.pdf								
162	Marble Island	Road	Colchester0000.pdf								
164	Marble Island	Road	Colchester0009.pdf								
166	Marble Island	Road	Colchester0010.pdf								
170	Marble Island	Road	Colchester0011.pdf								
171	Marble Island	Road	Colchester0000.pdf								
172	Marble Island	Road	Colchester0012.pdf								
184	Marble Island	Road	Colchester0013.pdf								
187	Marble Island	Road	Colchester0014.pdf								
210	Marble Island	Road	Colchester0015.pdf								
221	Marble Island	Road	Colchester0016.pdf								
235	Marble Island	Road	Colchester0017.pdf								
263	Marble Island	Road	Colchester0018.pdf								
267	Marble Island	Road	Colchester0000.pdf								
274	Marble Island	Road	Colchester0000.pdf								
290	Marble Island	Road	Colchester0019.pdf								
292	Marble Island	Road	Colchester0020.pdf								
297	Marble Island	Road	Colchester0021.pdf								
305	Marble Island	Road	Colchester0000.pdf								
312	Marble Island	Road	Colchester0000.pdf								
319	Marble Island	Road	Colchester0022.pdf								
328	Marble Island	Road	Colchester0023.pdf								
339	Marble Island	Road	Colchester0000.pdf								
346	Marble Island	Road	Colchester0000.pdf								
357	Marble Island	Road	Colchester0024.pdf								
379	Marble Island	Road	Colchester0025.pdf								
386	Marble Island	Road	Colchester0000.pdf								
388	Marble Island	Road	Colchester0000.pdf								
402	Marble Island	Road	Colchester0026.pdf								
419	Marble Island	Road	Colchester0000.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
426	Marble Island	Road	Colchester0000.pdf	1501422006	N	N	N	N	—	9/22/16	Premier
575	Marble Island	Road	Colchester0000.pdf						—		
637	Marble Island	Road	Colchester0028.pdf						—		
641	Marble Island	Road	Colchester0029.pdf						—		
649	Marble Island	Road	Colchester0030.pdf						—		
9	Marsh	Lane	Colchester0000.pdf		N	N	N	N	—	9/19/16	
24	Marsh	Lane	Colchester0000.pdf						—		
40	Marsh	Lane	Colchester0000.pdf						—		
12	Mazza	Court	Colchester0001.pdf		N	N	N	N	—	9/28/16	
28	Mazza	Court	Colchester0001.pdf								
46	Mazza	Court	Colchester0002.pdf								
78	Mazza	Court	Colchester0000.pdf								
106	Mazza	Court	Colchester0003.pdf								
9	McHawk	Drive	Colchester0000.pdf		N	N	N	N	—	9/22/16	
19	McHawk	Drive	Colchester0001.pdf						—		
21	McHawk	Drive	Colchester0002.pdf						—		
118	McHawk	Drive	Colchester0003.pdf						—		
132	McHawk	Drive	Colchester0004.pdf						—		
6	McNeil	Road	Colchester0000.pdf		N	N	N	N	—	9/20/16	
22	McNeil	Road	Colchester0001.pdf						—		
32	McNeil	Road	Colchester0002.pdf						—		
16	Meadow	Drive	Colchester0000.pdf		N	N	N	N	—	9/22/16	
48	Meadow	Drive	Colchester0000.pdf								
76	Meadow	Drive	Colchester0001.pdf								
94	Meadow	Drive	Colchester0002.pdf								
103	Meadow	Drive	Colchester0003.pdf								
114	Meadow	Drive	Colchester0004.pdf								
146	Meadow	Drive	Colchester0005.pdf								
156	Meadow	Drive	Colchester0006.pdf								
164	Meadow	Drive	Colchester0007.pdf								
186	Meadow	Drive	Colchester0008.pdf								
195	Meadow	Drive	Colchester0009.pdf								
204	Meadow	Drive	Colchester0010.pdf								
217	Meadow	Drive	Colchester0011.pdf								
232	Meadow	Drive	Colchester0012.pdf								
240	Meadow	Drive	Colchester0000.pdf								
275	Meadow	Drive	Colchester0000.pdf								
27	Mercier	Drive	Colchester0000.pdf		N	N	N	N	—	9/22/16	

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
28	Mercier	Drive	Colchester0000.pdf	150422006	N	N	N	N	—	4/22/16	Premier
29	Mercier	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
30	Mercier	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
61	Mercier	Drive	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
63	Mercier	Drive	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
86	Mercier	Drive	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
99	Mercier	Drive	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
102	Mercier	Drive	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
104	Mercier	Drive	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
134	Mercier	Drive	Colchester0007.pdf	↓	↓	↓	↓	↓	↓	↓	↓
139	Mercier	Drive	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
163	Mercier	Drive	Colchester0009.pdf	↓	↓	↓	↓	↓	↓	↓	↓
165	Mercier	Drive	Colchester0010.pdf	↓	↓	↓	↓	↓	↓	↓	↓
166	Mercier	Drive	Colchester0011.pdf	↓	↓	↓	↓	↓	↓	↓	↓
7	Merganser	Way	Colchester0000.pdf	↓	N	N	N	N	—	4/19/16	↓
31	Merganser	Way	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
92	Middle	Road	Colchester0001.pdf	↓	N	N	N	N	—	4/27/16	↓
107	Middle	Road	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
142	Middle	Road	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
193	Middle	Road	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
197	Middle	Road	Colchester0007.pdf	↓	↓	↓	↓	↓	↓	↓	↓
16	Midnight	Pass	Colchester0000.pdf	↓	N	N	N	N	—	4/26/16	↓
60	Midnight	Pass	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
102	Midnight	Pass	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
110	Midnight	Pass	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
118	Midnight	Pass	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
124	Midnight	Pass	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
76	Mills Point	Road	Colchester0000.pdf	↓	N	N	N	N	—	4/19/16	↓
60	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
100	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
107	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
132	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
275	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
337	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
459	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
462	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
495	Mills Point	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
500	Mills Point	Road	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
507	Mills Point	Road	Colchester0001.pdf	1501422006	N	N	N	N	-	4/19/16	Premier
522	Mills Point	Road	Colchester0002.pdf								
525	Mills Point	Road	Colchester0000.pdf								
538	Mills Point	Road	Colchester0003.pdf								
545	Mills Point	Road	Colchester0004.pdf								
550	Mills Point	Road	Colchester0005.pdf								
101	Morehouse	Drive	Colchester0000.pdf		N	N	N	N	-	4/20/16	
102	Morehouse	Drive	Colchester0001.pdf								
130	Morehouse	Drive	Colchester0002.pdf								
131	Morehouse	Drive	Colchester0003.pdf								
143	Morehouse	Drive	Colchester0004.pdf								
144	Morehouse	Drive	Colchester0005.pdf								
166	Morehouse	Drive	Colchester0006.pdf								
180	Morehouse	Drive	Colchester0007.pdf								
185	Morehouse	Drive	Colchester0008.pdf								
194	Morehouse	Drive	Colchester0009.pdf								
235	Morehouse	Drive	Colchester0010.pdf								
252	Morehouse	Drive	Colchester0011.pdf								
255	Morehouse	Drive	Colchester0012.pdf								
285	Morehouse	Drive	Colchester0013.pdf								
24	Morellen	Lane	Colchester0000.pdf		N	N	N	N	-	4/26/16	
56	Morellen	Lane	Colchester0001.pdf						-		
79	Morellen	Lane	Colchester0002.pdf						-		
86	Morellen	Lane	Colchester0003.pdf						-		
91	Morellen	Lane	Colchester0004.pdf						-		
8	Mount Mansfield	Avenue	Colchester0000.pdf	Colchester0000.pdf	N	N	N	N	-	4/29/16	
14	Mount Mansfield	Avenue	Colchester0000.pdf								
20	Mount Mansfield	Avenue	Colchester0000.pdf								
30	Mount Mansfield	Avenue	Colchester0000.pdf								
66	Mountain View	Drive	Colchester0000.pdf		N	N	N	N	-	4/28/16	
69	Mountain View	Drive	Colchester0000.pdf						-		
261	Mountain View	Drive	Colchester0000.pdf						-		
298	Mountain View	Drive	Colchester0003.pdf						-		
302	Mountain View	Drive	Colchester0004.pdf						-		
354	Mountain View	Drive	Colchester0005.pdf						-		
356	Mountain View	Drive	Colchester0006.pdf						-		
463	Mountain View	Drive	Colchester0007.pdf						-		
25	Murdoch	Glen	Colchester0000.pdf		N	N	N	N	-	4/22/16	

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
49	Murdoch	Glen	Colchester0001.pdf	1501-422006	N	N	N	N	—	9/22/16	Premier
33	Naomis	Way	Colchester0000.pdf		N	N	N	N	—	9/27/16	
15	New England	Avenue	Colchester0000.pdf		N	N	N	N	—	9/22/16	
52	New England	Avenue	Colchester0000.pdf								
55	New England	Avenue	Colchester0000.pdf								
65	New England	Avenue	Colchester0001.pdf								
71	New England	Avenue	Colchester0000.pdf								
79	New England	Avenue	Colchester0002.pdf								
91	New England	Avenue	Colchester0003.pdf								
99	New England	Avenue	Colchester0000.pdf								
113	New England	Avenue	Colchester0000.pdf								
42	Nice	Way	Colchester0000.pdf		N	N	N	N	—	9/26/16	
64	Nice	Way	Colchester0001.pdf								
75	Nice	Way	Colchester0002.pdf								
86	Nice	Way	Colchester0003.pdf								
107	Nice	Way	Colchester0004.pdf								
112	Nice	Way	Colchester0005.pdf								
136	Nice	Way	Colchester0006.pdf								
151	Nice	Way	Colchester0007.pdf								
156	Nice	Way	Colchester0008.pdf								
180	Nice	Way	Colchester0009.pdf								
199	Nice	Way	Colchester0010.pdf								
204	Nice	Way	Colchester0011.pdf								
221	Nice	Way	Colchester0012.pdf								
228	Nice	Way	Colchester0013.pdf								
252	Nice	Way	Colchester0014.pdf								
276	Nice	Way	Colchester0015.pdf								
298	Nice	Way	Colchester0016.pdf								
9	North Beach	Road	Colchester0000.pdf		N	N	N	N	—	9/22/16	
21	North Beach	Road	Colchester0000.pdf						—		
29	North Beach	Road	Colchester0000.pdf						—		
50	North Beach	Road	Colchester0000.pdf						—		
55	North Beach	Road	Colchester0000.pdf						—		
26	Northland	Court	Colchester0000.pdf		N	N	N	N	—	9/19/16	
35	Northland	Court	Colchester0001.pdf						—		
36	Northland	Court	Colchester0002.pdf						—		
12	Norway	Drive	Colchester0000.pdf		N	N	N	N	—	9/22/16	
38	Norway	Drive	Colchester0001.pdf		N	N	N	N	—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
43	Norway	Drive	Colchester0002.pdf	1501-422006	N	N	N	N	—	9/2/16	Premier
74	Norway	Drive	Colchester0002.pdf								
97	Norway	Drive	Colchester0000.pdf								
107	Norway	Drive	Colchester0003.pdf								
129	Norway	Drive	Colchester0004.pdf								
132	Norway	Drive	Colchester0005.pdf								
153	Norway	Drive	Colchester0006.pdf								
179	Norway	Drive	Colchester0000.pdf								
196	Norway	Drive	Colchester0000.pdf								
198	Norway	Drive	Colchester0000.pdf								
205	Norway	Drive	Colchester0007.pdf								
213	Norway	Drive	Colchester0000.pdf								
013-25	Nottingham	Court	Colchester0000.pdf		N	N	N	N	—	9/2/16	
026-38	Nottingham	Court	Colchester0001.pdf								
035-47	Nottingham	Court	Colchester0002.pdf								
62	Nottingham	Court	Colchester0003.pdf								
73	Nottingham	Court	Colchester0004.pdf								
102	Nottingham	Court	Colchester0005.pdf								
109-121	Nottingham	Court	Colchester0006.pdf								
133	Nottingham	Court	Colchester0007.pdf								
151-157	Nottingham	Court	Colchester0008.pdf								
7	Oak Circle	Drive	Colchester0000.pdf		N	N	N	N	—	9/2/16	
18	Oak Circle	Drive	Colchester0002.pdf						—		
27	Oak Circle	Drive	Colchester0004.pdf						—		
30	Oak Circle	Drive	Colchester0006.pdf						—		
45	Oak Circle	Drive	Colchester0008.pdf	See next page	CGI	CGI	CGI	CGI	under enclosed deck		
68	Oak Circle	Drive	Colchester0010.pdf		N	N	N	N	—		
69	Oak Circle	Drive	Colchester0012.pdf								
86	Oak Circle	Drive	Colchester0014.pdf								
87	Oak Circle	Drive	Colchester0016.pdf								
111	Oak Circle	Drive	Colchester0018.pdf								
116	Oak Circle	Drive	Colchester0019.pdf								
142	Oak Circle	Drive	Colchester0021.pdf								
149	Oak Circle	Drive	Colchester0022.pdf								
156	Oak Circle	Drive	Colchester0024.pdf								
171	Oak Circle	Drive	Colchester0026.pdf								
190A	Oak Circle	Drive	Colchester0028.pdf								
190B	Oak Circle	Drive	Colchester0029.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
43	Norway	Drive	Colchester0002.pdf	1501-422006	N	N	N	N	—	9/20/16	Premier
74	Norway	Drive	Colchester0002.pdf								
97	Norway	Drive	Colchester0000.pdf								
107	Norway	Drive	Colchester0003.pdf								
129	Norway	Drive	Colchester0004.pdf								
132	Norway	Drive	Colchester0005.pdf								
153	Norway	Drive	Colchester0006.pdf								
179	Norway	Drive	Colchester0000.pdf								
196	Norway	Drive	Colchester0000.pdf								
198	Norway	Drive	Colchester0000.pdf								
205	Norway	Drive	Colchester0007.pdf								
213	Norway	Drive	Colchester0000.pdf								
013-25	Nottingham	Court	Colchester0000.pdf		N	N	N	N	—	9/21/16	
026-38	Nottingham	Court	Colchester0001.pdf								
035-47	Nottingham	Court	Colchester0002.pdf								
62	Nottingham	Court	Colchester0003.pdf								
73	Nottingham	Court	Colchester0004.pdf								
102	Nottingham	Court	Colchester0005.pdf								
109-121	Nottingham	Court	Colchester0006.pdf								
133	Nottingham	Court	Colchester0007.pdf								
151-157	Nottingham	Court	Colchester0008.pdf								
7	Oak Circle	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
18	Oak Circle	Drive	Colchester0002.pdf						—		
27	Oak Circle	Drive	Colchester0004.pdf						—		
30	Oak Circle	Drive	Colchester0006.pdf						—		
45	Oak Circle	Drive	Colchester0008.pdf	DPI R—	CGI N	CGI N	CGI N	CGI N	under enclosed deck	5/31/16	562
68	Oak Circle	Drive	Colchester0010.pdf		N	N	N	N	—		
69	Oak Circle	Drive	Colchester0012.pdf								
86	Oak Circle	Drive	Colchester0014.pdf								
87	Oak Circle	Drive	Colchester0016.pdf								
111	Oak Circle	Drive	Colchester0018.pdf								
116	Oak Circle	Drive	Colchester0019.pdf								
142	Oak Circle	Drive	Colchester0021.pdf								
149	Oak Circle	Drive	Colchester0022.pdf								
156	Oak Circle	Drive	Colchester0024.pdf								
171	Oak Circle	Drive	Colchester0026.pdf								
190A	Oak Circle	Drive	Colchester0028.pdf								
190B	Oak Circle	Drive	Colchester0029.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
199	Oak Circle	Drive	Colchester0030.pdf	1501-422006	N	N	N	N	—	4/20/16	Premier
209	Oak Circle	Drive	Colchester0032.pdf								
235	Oak Circle	Drive	Colchester0034.pdf								
256A	Oak Circle	Drive	Colchester0036.pdf								
256B	Oak Circle	Drive	Colchester0037.pdf								
274	Oak Circle	Drive	Colchester0038.pdf								
285	Oak Circle	Drive	Colchester0039.pdf								
296	Oak Circle	Drive	Colchester0041.pdf								
316	Oak Circle	Drive	Colchester0042.pdf								
330	Oak Circle	Drive	Colchester0043.pdf								
341	Oak Circle	Drive	Colchester0045.pdf								
344	Oak Circle	Drive	Colchester0047.pdf								
354	Oak Circle	Drive	Colchester0049.pdf								
370	Oak Circle	Drive	Colchester0050.pdf								
382	Oak Circle	Drive	Colchester0051.pdf								
383	Oak Circle	Drive	Colchester0053.pdf								
407	Oak Circle	Drive	Colchester0055.pdf								
418	Oak Circle	Drive	Colchester0057.pdf								
423	Oak Circle	Drive	Colchester0059.pdf								
438A	Oak Circle	Drive	Colchester0061.pdf								
438B	Oak Circle	Drive	Colchester0062.pdf								
438C	Oak Circle	Drive	Colchester0063.pdf								
438D	Oak Circle	Drive	Colchester0064.pdf								
440A	Oak Circle	Drive	Colchester0000.pdf								
440B	Oak Circle	Drive	Colchester0066.pdf								
440C	Oak Circle	Drive	Colchester0067.pdf								
440D	Oak Circle	Drive	Colchester0068.pdf								
440E	Oak Circle	Drive	Colchester0069.pdf								
440F	Oak Circle	Drive	Colchester0070.pdf								
447	Oak Circle	Drive	Colchester0071.pdf								
461	Oak Circle	Drive	Colchester0073.pdf								
464	Oak Circle	Drive	Colchester0075.pdf								
470	Oak Circle	Drive	Colchester0077.pdf								
480	Oak Circle	Drive	Colchester0079.pdf								
481	Oak Circle	Drive	Colchester0081.pdf								
531	Oak Circle	Drive	Colchester0083.pdf								
545	Oak Circle	Drive	Colchester0085.pdf								
567	Oak Circle	Drive	Colchester0087.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
593	Oak Circle	Drive	Colchester0089.pdf	1501-422006	N	N	N	N	—	9/20/16	Premier
617	Oak Circle	Drive	Colchester0092.pdf						—		
643	Oak Circle	Drive	Colchester0094.pdf		↓	↓	↓	↓	—	↓	
17	Oak Ridge	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
44	Oak Ridge	Drive	Colchester0001.pdf		N	N	N	N	—		
64	Oak Ridge	Drive	Colchester0002.pdf		N	N	N	N	—	↓	
020A	Oak	Terrace	Colchester0000.pdf		N	N	N	N	—	9/28/16	
020B	Oak	Terrace	Colchester0000.pdf								
034A	Oak	Terrace	Colchester0000.pdf								
034B	Oak	Terrace	Colchester0001.pdf								
056A	Oak	Terrace	Colchester0000.pdf								
056B	Oak	Terrace	Colchester0000.pdf								
081A	Oak	Terrace	Colchester0002.pdf								
081B	Oak	Terrace	Colchester0000.pdf								
114A	Oak	Terrace	Colchester0004.pdf								
114B	Oak	Terrace	Colchester0000.pdf								
138A	Oak	Terrace	Colchester0006.pdf								
138B	Oak	Terrace	Colchester0000.pdf								
140A	Oak	Terrace	Colchester0000.pdf								
140B	Oak	Terrace	Colchester0000.pdf								
143A	Oak	Terrace	Colchester0007.pdf								
143B	Oak	Terrace	Colchester0000.pdf								
150A	Oak	Terrace	Colchester0008.pdf								
150B	Oak	Terrace	Colchester0000.pdf								
159A	Oak	Terrace	Colchester0000.pdf								
159B	Oak	Terrace	Colchester0000.pdf								
188A	Oak	Terrace	Colchester0000.pdf								
188B	Oak	Terrace	Colchester0000.pdf								
203A	Oak	Terrace	Colchester0009.pdf								
203B	Oak	Terrace	Colchester0000.pdf								
204A	Oak	Terrace	Colchester0010.pdf								
204B	Oak	Terrace	Colchester0000.pdf								
224A	Oak	Terrace	Colchester0000.pdf								
224B	Oak	Terrace	Colchester0000.pdf								
225A	Oak	Terrace	Colchester0011.pdf								
225B	Oak	Terrace	Colchester0000.pdf								
258A	Oak	Terrace	Colchester0012.pdf								
258B	Oak	Terrace	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
278A	Oak	Terrace	Colchester0000.pdf	1501-442006	N	N	N	N	—	9/19/16	Premier
278B	Oak	Terrace	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
11	Observatory	Lane	Colchester0000.pdf	↓	N	N	N	N	—	9/21/16	↓
13	Observatory	Lane	Colchester0002.pdf	↓	N	N	N	N	—	↓	↓
31	Observatory	Lane	Colchester0004.pdf	↓	N	N	N	N	—	↓	↓
66A	Observatory	Lane	Colchester0005.pdf	↓	N	N	N	N	—	↓	↓
66B	Observatory	Lane	Colchester0006.pdf	↓	N	N	N	N	—	↓	↓
51	Old Sawmill	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/22/16	↓
54	Old Sawmill	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
76	Old Sawmill	Road	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
89	Old Sawmill	Road	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
102	Old Sawmill	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
113	Old Sawmill	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
126	Old Sawmill	Road	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
128	Old Sawmill	Road	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
14	Old Sawmill	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
37	Old Well	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/23/16	↓
83	Old Well	Road	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
24	Orchard	Circle	Colchester0002.pdf	↓	N	N	N	N	—	9/26/16	↓
40	Orchard	Circle	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
54	Orchard	Circle	Colchester0004.pdf	↓	↓	↓	↓	↓	—	↓	↓
74	Orchard	Drive	Colchester0002.pdf	↓	N	N	N	N	—	9/26/16	↓
95	Orchard	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
98	Orchard	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
118	Orchard	Drive	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
121	Orchard	Drive	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
144	Orchard	Drive	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
195	Orchard	Drive	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
198	Orchard	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
241	Orchard	Drive	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
254	Orchard	Drive	Colchester0009.pdf	↓	↓	↓	↓	↓	↓	↓	↓
261	Orchard	Drive	Colchester0010.pdf	↓	↓	↓	↓	↓	↓	↓	↓
281	Orchard	Drive	Colchester0011.pdf	↓	↓	↓	↓	↓	↓	↓	↓
309	Orchard	Drive	Colchester0012.pdf	↓	↓	↓	↓	↓	↓	↓	↓
329	Orchard	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
336	Orchard	Drive	Colchester0013.pdf	↓	↓	↓	↓	↓	↓	↓	↓
345	Orchard	Drive	Colchester0015.pdf	↓	↓	↓	↓	↓	↓	↓	↓
361	Orchard	Drive	Colchester0014	corr.pdf ↓	↓	↓	↓	↓	↓	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
361	Orchard	Drive	Colchester00140000.pdf	1501-422006	N	N	N	N	—	4/26/16	Premier
368	Orchard	Drive	Colchester0016.pdf								
381	Orchard	Drive	Colchester0017.pdf								
393	Orchard	Drive	Colchester0018.pdf								
396	Orchard	Drive	Colchester0019.pdf								
413	Orchard	Drive	Colchester0020.pdf								
439	Orchard	Drive	Colchester0021.pdf								
443	Orchard	Drive	Colchester0022.pdf								
450	Orchard	Drive	Colchester0023.pdf								
463	Orchard	Drive	Colchester0024.pdf								
486	Orchard	Drive	Colchester0025.pdf								
495	Orchard	Drive	Colchester0026.pdf								
510	Orchard	Drive	Colchester0027.pdf								
513	Orchard	Drive	Colchester0028.pdf								
20	Orion	Drive	Colchester0001.pdf		N	N	N	N		4/20/16	
123	Orion	Drive	Colchester0002.pdf								
130	Orion	Drive	Colchester0003.pdf								
41	Outer Bay	Lane	Colchester0000.pdf		N	N	N	N	—	4/20/16	
65	Outer Bay	Lane	Colchester0000.pdf						—		
65	Outer Bay	Lane	Colchester0000.pdf						—		
67	Outer Bay	Lane	Colchester0000.pdf						—		
23	Overlake	Drive	Colchester0000.pdf		N	N	N	N	—	4/20/16	
43	Overlake	Drive	Colchester0001.pdf								
56	Overlake	Drive	Colchester0002.pdf								
59	Overlake	Drive	Colchester0003.pdf								
77	Overlake	Drive	Colchester0004.pdf								
78	Overlake	Drive	Colchester0005.pdf								
96	Overlake	Drive	Colchester0006.pdf								
97	Overlake	Drive	Colchester0007.pdf								
114	Overlake	Drive	Colchester0008.pdf								
119	Overlake	Drive	Colchester0000.pdf								
132	Overlake	Drive	Colchester0010.pdf								
141	Overlake	Drive	Colchester0011.pdf								
150	Overlake	Drive	Colchester0012.pdf								
167	Overlake	Drive	Colchester0013.pdf								
170	Overlake	Drive	Colchester0014.pdf								
180	Overlake	Drive	Colchester0015.pdf								
217	Overlake	Drive	Colchester0016.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
218	Overlake	Drive	Colchester0017.pdf	1501-Arrowh	N	N	N	N	—	9/20/16	Premier
16	Parkwood	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
51	Parkwood	Drive	Colchester0001.pdf								
67	Parkwood	Drive	Colchester0002.pdf								
83	Parkwood	Drive	Colchester0003.pdf								
101	Parkwood	Drive	Colchester0004.pdf								
26	Parsons	Road	Colchester0000.pdf		N	N	N	N	—	9/20/16	
63	Partridge	Hill	Colchester0000.pdf		N	N	N	N	—	9/20/16	
63	Partridge	Hill	Colchester0000.pdf								
63	Partridge	Hill	Colchester0000.pdf								
126	Partridge	Hill	Colchester0001.pdf								
126	Partridge	Hill	Colchester0000.pdf								
126	Partridge	Hill	Colchester0000.pdf								
138	Partridge	Hill	Colchester0002.pdf								
138	Partridge	Hill	Colchester0000.pdf								
138	Partridge	Hill	Colchester0000.pdf								
160	Partridge	Hill	Colchester0003.pdf								
160	Partridge	Hill	Colchester0000.pdf								
160	Partridge	Hill	Colchester0000.pdf								
13	Payne	Street	Colchester0000.pdf		N	N	N	N	—	9/29/16	
13A	Peach Tree	Lane	Colchester0000.pdf		N	N	N	N	—	9/28/16	
13B	Peach Tree	Lane	Colchester0001.pdf								
47A	Peach Tree	Lane	Colchester0003.pdf								
47B	Peach Tree	Lane	Colchester0004.pdf								
58A	Peach Tree	Lane	Colchester0005.pdf								
58B	Peach Tree	Lane	Colchester0006.pdf								
195	Perimeter	Drive	Colchester0000.pdf		N	N	N	N	—	9/27/16	
220	Perimeter	Drive	Colchester00000000.pdf								
245	Perimeter	Drive	Colchester0000.pdf								
42	Pierre	Court	Colchester0000.pdf								
84	Pierre	Court	Colchester0001.pdf								
110	Pierre	Court	Colchester0000.pdf								
39	Pine	Lane	Colchester0000.pdf		N	N	N	N	—	9/20/16	
44	Pine	Lane	Colchester0001.pdf								
57	Pine	Lane	Colchester0002.pdf								
75	Pine	Lane	Colchester0003.pdf								
86	Pine	Lane	Colchester0004.pdf								
97	Pine	Lane	Colchester0005.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
104	Pine	Lane	Colchester0006.pdf	1501-422006	N	N	N	N	—	4/20/16	Premier
113	Pine	Lane	Colchester0007.pdf								
124	Pine	Lane	Colchester0008.pdf								
133	Pine	Lane	Colchester0009.pdf								
138	Pine	Lane	Colchester0010.pdf								
31	Pine Meadow	Drive	Colchester0000.pdf		N	N	N	N	—	4/20/16	
51	Pine Meadow	Drive	Colchester0001.pdf								
62	Pine Meadow	Drive	Colchester0000.pdf								
91	Pine Meadow	Drive	Colchester0000.pdf								
100	Pine Meadow	Drive	Colchester0002.pdf								
120	Pine Meadow	Drive	Colchester0003.pdf								
160	Pine Meadow	Drive	Colchester0004.pdf								
230	Pine Meadow	Drive	Colchester0005.pdf								
254	Pine Meadow	Drive	Colchester0006.pdf								
275	Pine Meadow	Drive	Colchester0007.pdf								
304	Pine Meadow	Drive	Colchester0008.pdf								
311	Pine Meadow	Drive	Colchester0009.pdf								
86	Saint Michaels		Colchester0000.pdf		N	N	N	N	—	4/29/16	
102	Saint Michaels		Colchester0000.pdf								
154A	Saint Michaels		Colchester0000.pdf								
154B	Saint Michaels		Colchester0000.pdf								
154C	Saint Michaels		Colchester0000.pdf								
92	Saint Michaels		Colchester0000.pdf								
23	Ponderosa	Drive	Colchester0000.pdf		N	N	N	N	—	4/21/16	
32	Ponderosa	Drive	Colchester0001.pdf								
47	Ponderosa	Drive	Colchester0002.pdf								
50	Ponderosa	Drive	Colchester0003.pdf								
72	Ponderosa	Drive	Colchester0004.pdf								
17	Pontigny	Place	Colchester.pdf		N	N	N	N	—	4/29/16	
22	Pontigny	Place	Colchester0000.pdf		N	N	N	N	—		
38	Poor Farm	Road	Colchester0000.pdf		N	N	N	N	—	4/27/16	
40	Poor Farm	Road	Colchester0001.pdf								
89	Poor Farm	Road	Colchester0002.pdf								
94	Poor Farm	Road	Colchester0000.pdf								
96	Poor Farm	Road	Colchester0000.pdf								
111	Poor Farm	Road	Colchester0003.pdf								
135	Poor Farm	Road	Colchester0004.pdf								
193A	Poor Farm	Road	Colchester0005.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
193B	Poor Farm	Road	Colchester0006.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
195	Poor Farm	Road	Colchester0007.pdf								
265	Poor Farm	Road	Colchester0000.pdf								
288	Poor Farm	Road	Colchester0008.pdf								
492	Poor Farm	Road	Colchester0009.pdf								
494	Poor Farm	Road	Colchester0000.pdf								
496	Poor Farm	Road	Colchester0000.pdf								
613	Poor Farm	Road	Colchester0010.pdf								
689	Poor Farm	Road	Colchester0000.pdf								
702	Poor Farm	Road	Colchester0011.pdf								
810	Poor Farm	Road	Colchester0012.pdf								
41	Porters Point	Court	Colchester0000.pdf		N	N	N	N	—	9/30/16	
72	Porters Point	Court	Colchester0000.pdf		N	N	N	N	—		
75	Porters Point	Road	Colchester0000.pdf			N					
25	Porters Point	Road	Colchester0000.pdf								
41	Porters Point	Road	Colchester0001.pdf								
55	Porters Point	Road	Colchester0002.pdf								
77	Porters Point	Road	Colchester0000.pdf								
127	Porters Point	Road	Colchester0003.pdf								
155	Porters Point	Road	Colchester0000.pdf								
157	Porters Point	Road	Colchester0000.pdf								
164	Porters Point	Road	Colchester0005.pdf								
247	Porters Point	Road	Colchester0000.pdf								
253	Porters Point	Road	Colchester0000.pdf								
256	Porters Point	Road	Colchester0000.pdf								
264	Porters Point	Road	Colchester0006.pdf								
267	Porters Point	Road	Colchester0000.pdf								
276	Porters Point	Road	Colchester0008.pdf								
281	Porters Point	Road	Colchester0001.pdf								
293	Porters Point	Road	Colchester0000.pdf								
304	Porters Point	Road	Colchester0010.pdf								
307	Porters Point	Road	Colchester0011.pdf								
327	Porters Point	Road	Colchester0012.pdf								
344	Porters Point	Road	Colchester0013.pdf								
372	Porters Point	Road	Colchester0014.pdf								
390	Porters Point	Road	Colchester0015.pdf								
412	Porters Point	Road	Colchester0016.pdf								
416	Porters Point	Road	Colchester0000.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
0427-429	Porters Point	Road	Colchester0017.pdf	1501-4220006	N	N	N	N	—	9/20/16	Premier
441	Porters Point	Road	Colchester0018.pdf								
490	Porters Point	Road	Colchester0019.pdf								
499	Porters Point	Road	Colchester0020.pdf								
506	Porters Point	Road	Colchester0021.pdf								
521	Porters Point	Road	Colchester0022.pdf								
533	Porters Point	Road	Colchester0023.pdf								
558	Porters Point	Road	Colchester0024.pdf								
569	Porters Point	Road	Colchester0025.pdf								
637	Porters Point	Road	Colchester0026.pdf								
638	Porters Point	Road	Colchester0027.pdf								
655	Porters Point	Road	Colchester0028.pdf								
664	Porters Point	Road	Colchester0029.pdf								
673	Porters Point	Road	Colchester0000.pdf								
693	Porters Point	Road	Colchester0031.pdf								
723	Porters Point	Road	Colchester0032.pdf								
741	Porters Point	Road	Colchester0000.pdf								
752	Porters Point	Road	Colchester0033.pdf								
776	Porters Point	Road	Colchester0000.pdf								
820	Porters Point	Road	Colchester0034.pdf								
838	Porters Point	Road	Colchester0035.pdf								
0847-851	Porters Point	Road	Colchester0000.pdf								
0859-863	Porters Point	Road	Colchester0000.pdf								
868	Porters Point	Road	Colchester0037.pdf								
893	Porters Point	Road	Colchester0038.pdf								
902	Porters Point	Road	Colchester0039.pdf								
925	Porters Point	Road	Colchester0040.pdf								
951	Porters Point	Road	Colchester0041.pdf								
965	Porters Point	Road	Colchester0042.pdf								
968	Porters Point	Road	Colchester0000.pdf								
1035	Porters Point	Road	Colchester0000.pdf								
1038	Porters Point	Road	Colchester.pdf								
1047	Porters Point	Road	Colchester0046.pdf								
1049	Porters Point	Road	Colchester0000.pdf								
1064	Porters Point	Road	Colchester0047.pdf								
1136	Porters Point	Road	Colchester0048.pdf								
1192	Porters Point	Road	Colchester0049.pdf								
1244	Porters Point	Road	Colchester0050.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
1285	Porters Point	Road	Colchester0051.pdf	1501-422006	N	N	N	N	—	9/20/16	Premier
1285	Porters Point	Road	Colchester0052.pdf								
1299	Porters Point	Road	Colchester0053.pdf								
1301	Porters Point	Road	Colchester0054.pdf								
1317	Porters Point	Road	Colchester0055.pdf								
1411	Porters Point	Road	Colchester0056.pdf								
1518	Porters Point	Road	Colchester0058.pdf								
1519	Porters Point	Road	Colchester0059.pdf								
1526	Porters Point	Road	Colchester0060.pdf								
1528	Porters Point	Road	Colchester0061.pdf								
1561	Porters Point	Road	Colchester0062.pdf								
1572	Porters Point	Road	Colchester0063.pdf								
1605	Porters Point	Road	Colchester0064.pdf								
1608	Porters Point	Road	Colchester0065.pdf								
1638	Porters Point	Road	Colchester0066.pdf								
1653	Porters Point	Road	Colchester0000.pdf								
1668	Porters Point	Road	Colchester0067.pdf								
1691	Porters Point	Road	Colchester0068.pdf								
1747	Porters Point	Road	Colchester0070.pdf								
1800	Porters Point	Road	Colchester0071.pdf								
1817	Porters Point	Road	Colchester0072.pdf								
1843	Porters Point	Road	Colchester0073.pdf								
1877	Porters Point	Road	Colchester0074.pdf								
1929	Porters Point	Road	Colchester0000.pdf								
1945	Porters Point	Road	Colchester0075.pdf								
1975	Porters Point	Road	Colchester0000.pdf								
1989	Porters Point	Road	Colchester0000.pdf								
1994	Porters Point	Road	Colchester0076.pdf								
2019	Porters Point	Road	Colchester0000.pdf								
2024	Porters Point	Road	Colchester0000.pdf								
2046	Porters Point	Road	Colchester0000.pdf								
2074	Porters Point	Road	Colchester0000.pdf								
2101	Porters Point	Road	Colchester0000.pdf								
2114	Porters Point	Road	Colchester0000.pdf								
2115	Porters Point	Road	Colchester0000.pdf								
2125	Porters Point	Road	Colchester0000.pdf								
2140	Porters Point	Road	Colchester0000.pdf								
2143	Porters Point	Road	Colchester0000.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
2198	Porters Point	Road	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/20/16	Premier
2224	Porters Point	Road	Colchester00000000.pdf								
2260	Porters Point	Road	Colchester00000000.pdf								
2284	Porters Point	Road	Colchester0000.pdf								
2297	Porters Point	Road	Colchester0000.pdf								
2299	Porters Point	Road	Colchester0000.pdf								
461	Porters Point	Road	Colchester0000.pdf								
40	Pretty	Road	Colchester0000.pdf		N	N	N	N	—	9/20/16	
57	Pretty	Road	Colchester0001.pdf								
72	Pretty	Road	Colchester0002.pdf								
81	Pretty	Road	Colchester0003.pdf								
94	Pretty	Road	Colchester0004.pdf								
95	Pretty	Road	Colchester0005.pdf								
115	Pretty	Road	Colchester0006.pdf								
124	Pretty	Road	Colchester0000.pdf								
135	Pretty	Road	Colchester0007.pdf								
146	Pretty	Road	Colchester0008.pdf								
151	Pretty	Road	Colchester0009.pdf								
160	Pretty	Road	Colchester0010.pdf								
163	Pretty	Road	Colchester0000.pdf								
205	Pretty	Road	Colchester0012.pdf								
225	Pretty	Road	Colchester0013.pdf								
227	Pretty	Road	Colchester0014.pdf								
1 & 2	Prim	Road	Colchester0000.pdf		N	N	N	N	—	9/22/16	
3 thru 8	Prim	Road	Colchester0000.pdf								
353	Prim	Road	Colchester0000.pdf								
356	Prim	Road	Colchester0001.pdf								
0405A	Prim	Road	Colchester0002.pdf								
0405B	Prim	Road	Colchester0003.pdf								
474	Prim	Road	Colchester0005.pdf								
494	Prim	Road	Colchester0006.pdf								
508	Prim	Road	Colchester0000.pdf								
574	Prim	Road	Colchester0000.pdf								
642	Prim	Road	Colchester0007.pdf								
645	Prim	Road	Colchester0008.pdf								
650	Prim	Road	Colchester0009.pdf								
698	Prim	Road	Colchester0010.pdf								
699	Prim	Road	Colchester0011.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
717	Prim	Road	Colchester0012.pdf	1501-Arrow6	N	N	N	N	—	9/20/16	Premier
718	Prim	Road	Colchester0013.pdf								
745	Prim	Road	Colchester0014.pdf								
0746A	Prim	Road	Colchester0015.pdf								
0746B	Prim	Road	Colchester0016.pdf								
769	Prim	Road	Colchester0000.pdf								
0772A	Prim	Road	Colchester0017.pdf								
0772B	Prim	Road	Colchester0018.pdf								
777	Prim	Road	Colchester0000.pdf								
821	Prim	Road	Colchester.pdf								
0868A	Prim	Road	Colchester0021.pdf								
0868B	Prim	Road	Colchester0022.pdf								
880	Prim	Road	Colchester0023.pdf								
931	Prim	Road	Colchester0024.pdf								
950	Prim	Road	Colchester0000.pdf								
951	Prim	Road	Colchester0025.pdf								
964	Prim	Road	Colchester0026.pdf								
967	Prim	Road	Colchester0000.pdf								
992	Prim	Road	Colchester.pdf								
1032	Prim	Road	Colchester0027.pdf								
1063	Prim	Road	Colchester0029.pdf								
1110	Prim	Road	Colchester0030.pdf								
1161	Prim	Road	Colchester0031.pdf								
1177	Prim	Road	Colchester0032.pdf								
1184	Prim	Road	Colchester0033.pdf								
1217	Prim	Road	Colchester0034.pdf								
1241	Prim	Road	Colchester0035.pdf								
34	Princess Ann	Drive	Colchester0001.pdf		N	N	N	N	—	9/21/16	
51	Princess Ann	Drive	Colchester0002.pdf								
56	Princess Ann	Drive	Colchester0003.pdf								
88	Princess Ann	Drive	Colchester0004.pdf								
95	Princess Ann	Drive	Colchester0005.pdf								
109	Princess Ann	Drive	Colchester0006.pdf								
110	Princess Ann	Drive	Colchester0007.pdf								
127	Princess Ann	Drive	Colchester0008.pdf								
132	Princess Ann	Drive	Colchester0009.pdf								
154	Princess Ann	Drive	Colchester0010.pdf								
155	Princess Ann	Drive	Colchester0011.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
171	Princess Ann	Drive	Colchester0012.pdf	1501 Arrow	N	N	N	N	—	9/21/16	Premier
180	Princess Ann	Drive	Colchester0013.pdf	↓	↓	↓	↓	↓	↓	↓	↓
191	Princess Ann	Drive	Colchester0014.pdf	↓	↓	↓	↓	↓	↓	↓	↓
216	Princess Ann	Drive	Colchester0015.pdf	↓	↓	↓	↓	↓	↓	↓	↓
227	Princess Ann	Drive	Colchester0016.pdf	↓	↓	↓	↓	↓	↓	↓	↓
240	Princess Ann	Drive	Colchester0017.pdf	↓	↓	↓	↓	↓	↓	↓	↓
245	Princess Ann	Drive	Colchester0018.pdf	↓	↓	↓	↓	↓	↓	↓	↓
264	Princess Ann	Drive	Colchester0019.pdf	↓	↓	↓	↓	↓	↓	↓	↓
273	Princess Ann	Drive	Colchester0020.pdf	↓	↓	↓	↓	↓	↓	↓	↓
286	Princess Ann	Drive	Colchester0021.pdf	↓	↓	↓	↓	↓	↓	↓	↓
295	Princess Ann	Drive	Colchester0022.pdf	↓	↓	↓	↓	↓	↓	↓	↓
314	Princess Ann	Drive	Colchester0023.pdf	↓	↓	↓	↓	↓	↓	↓	↓
317	Princess Ann	Drive	Colchester0024.pdf	↓	↓	↓	↓	↓	↓	↓	↓
333	Princess Ann	Drive	Colchester0025.pdf	↓	↓	↓	↓	↓	↓	↓	↓
340	Princess Ann	Drive	Colchester0026.pdf	↓	↓	↓	↓	↓	↓	↓	↓
27	Rail	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/19/16	↓
29	Rail	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
49	Rail	Road	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
74	Rail	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
118	Rail	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
125	Rail	Road	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
139	Rail	Road	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
154	Rail	Road	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
180	Rail	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
208	Rail	Road	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
59	Rathe	Road	Colchester0002.pdf	↓	N	N	N	N	—	9/20/16	↓
71	Rathe	Road	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
14	Rathe	Road	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
25	Rea Janet	Drive	Colchester0000.pdf	↓	N	N	N	N	—	9/27/16	↓
118	Rea Janet	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
130	Rea Janet	Drive	Colchester0001.pdf	↓	↓	↓	↓	↓	—	↓	↓
218	Red Oak	Drive	Colchester0000.pdf	↓	N	N	N	N	—	9/19/16	↓
8	Red Oak	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
25	Red Oak	Drive	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
34	Red Oak	Drive	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
57	Red Oak	Drive	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
58	Red Oak	Drive	Colchester0004.pdf	↓	↓	↓	↓	↓	↓	↓	↓
84	Red Oak	Drive	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
87	Red Oak	Drive	Colchester0006.pdf	1501422006	N	N	N	N	—	9/15/16	Premier
106	Red Oak	Drive	Colchester0007.pdf								
111	Red Oak	Drive	Colchester0008.pdf								
136	Red Oak	Drive	Colchester0009.pdf								
147	Red Oak	Drive	Colchester0010.pdf								
180	Red Oak	Drive	Colchester0011.pdf								
202	Red Oak	Drive	Colchester0012.pdf								
203	Red Oak	Drive	Colchester0013.pdf								
220	Red Oak	Drive	Colchester0014.pdf								
231	Red Oak	Drive	Colchester0015.pdf								
232	Red Oak	Drive	Colchester0016.pdf								
245	Red Oak	Drive	Colchester0017.pdf								
265	Red Oak	Drive	Colchester0018.pdf								
274	Red Oak	Drive	Colchester0019.pdf								
281	Red Oak	Drive	Colchester0020.pdf								
298	Red Oak	Drive	Colchester0021.pdf								
301	Red Oak	Drive	Colchester0022.pdf								
314	Red Oak	Drive	Colchester0023.pdf								
330	Red Oak	Drive	Colchester0024.pdf								
348	Red Oak	Drive	Colchester0025.pdf								
367	Red Oak	Drive	Colchester0026.pdf								
396	Red Oak	Drive	Colchester0027.pdf								
422	Red Oak	Drive	Colchester0028.pdf								
28	Renkin	Drive	Colchester0001.pdf		N	N	N	N	—	9/20/16	
43	Renkin	Drive	Colchester0002.pdf								
48	Renkin	Drive	Colchester0003.pdf								
55	Renkin	Drive	Colchester0004.pdf								
68	Renkin	Drive	Colchester0005.pdf								
75	Renkin	Drive	Colchester0006.pdf								
80	Renkin	Drive	Colchester0007.pdf								
95	Renkin	Drive	Colchester0008.pdf								
102	Renkin	Drive	Colchester.pdf								
125	Renkin	Drive	Colchester0009.pdf								
36	Reynolds	Drive	Colchester0000.pdf							9/20/16	
45	Reynolds	Drive	Colchester00010000.pdf								
65	Reynolds	Drive	Colchester0001.pdf								
81	Reynolds	Drive	Colchester0002.pdf								
97	Reynolds	Drive	Colchester0003.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
104	Reynolds	Drive	Colchester0004.pdf	1501422006	N	N	N	N	—	4/28/16	PremieC
122	Reynolds	Drive	Colchester0005.pdf		N	N	N	N	—		
20	Richfield	Lane	Colchester0000.pdf		N	N	N	N	—	9/20/16	
021-23	Richfield	Lane	Colchester0001.pdf								
38	Richfield	Lane	Colchester0002.pdf								
43	Richfield	Lane	Colchester0003.pdf								
60	Richfield	Lane	Colchester0004.pdf								
63	Richfield	Lane	Colchester0005.pdf								
80	Richfield	Lane	Colchester0006.pdf								
83	Richfield	Lane	Colchester0007.pdf								
100	Richfield	Lane	Colchester0008.pdf								
101	Richfield	Lane	Colchester0009.pdf								
114	Richfield	Lane	Colchester0010.pdf								
127	Richfield	Lane	Colchester0011.pdf								
134	Richfield	Lane	Colchester0012.pdf								
33	Ridge Top	Way	Colchester0000.pdf		N	N	N	N	—	9/19/16	
38	Ridge Top	Way	Colchester0000.pdf						—		
58	Ridge Top	Way	Colchester0000.pdf						—		
57	River Bend	Lane	Colchester0002.pdf		N	N	N	N	—	9/20/16	
57	River Bend	Lane	Colchester0003.pdf								
116	River Bend	Lane	Colchester0000.pdf								
116	River Bend	Lane	Colchester0001.pdf								
157	River Bend	Lane	Colchester0004.pdf								
157	River Bend	Lane	Colchester0005.pdf								
16	River	Road	Colchester0000.pdf		N	N	N	N	—	9/20/16	
016B	River	Road	Colchester0001.pdf								
39	River	Road	Colchester.pdf								
90	River	Road	Colchester0002.pdf								
92	River	Road	Colchester0003.pdf								
99	River	Road	Colchester0004.pdf								
108	River	Road	Colchester0006.pdf								
110	River	Road	Colchester0008.pdf								
119	River	Road	Colchester0007.pdf								
128	River	Road	Colchester0009.pdf								
147	River	Road	Colchester0010.pdf								
157	River	Road	Colchester0011.pdf								
177	River	Road	Colchester0012.pdf								
178	River	Road	Colchester0013.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
194	River	Road	Colchester0014.pdf	1501-422006	N	N	N	N	—	4/20/16	Premier
205	River	Road	Colchester0015.pdf	↓	↓	↓	↓	↓	↓	↓	↓
227	River	Road	Colchester0016.pdf	↓	↓	↓	↓	↓	↓	↓	↓
264	River	Road	Colchester0018.pdf	↓	↓	↓	↓	↓	↓	↓	↓
276	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
277	River	Road	Colchester0019.pdf	↓	↓	↓	↓	↓	↓	↓	↓
293	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
294	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
316	River	Road	Colchester0021.pdf	↓	↓	↓	↓	↓	↓	↓	↓
318	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
366	River	Road	Colchester0022.pdf	↓	↓	↓	↓	↓	↓	↓	↓
394	River	Road	Colchester0023.pdf	↓	↓	↓	↓	↓	↓	↓	↓
407	River	Road	Colchester0024.pdf	↓	↓	↓	↓	↓	↓	↓	↓
426	River	Road	Colchester0025.pdf	↓	↓	↓	↓	↓	↓	↓	↓
429	River	Road	Colchester0026.pdf	↓	↓	↓	↓	↓	↓	↓	↓
439	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
446	River	Road	Colchester0027.pdf	↓	↓	↓	↓	↓	↓	↓	↓
459	River	Road	Colchester0028.pdf	↓	↓	↓	↓	↓	↓	↓	↓
479	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
497	River	Road	Colchester0031.pdf	↓	↓	↓	↓	↓	↓	↓	↓
57A	River	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
22A	Robert Frost	Circle	Colchester0000.pdf	↓	N	N	N	N	—	5/26/16	↓
22B	Robert Frost	Circle	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
22C	Robert Frost	Circle	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
22D	Robert Frost	Circle	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
26	Robert Frost	Circle	Colchester0004.pdf	Circle ↓	↓	↓	↓	↓	↓	↓	↓
26	Robert Frost	Circle	Colchester0000.pdf	Circle ↓	↓	↓	↓	↓	↓	↓	↓
26	Robert Frost	Circle	Colchester0000.pdf	Circle ↓	↓	↓	↓	↓	↓	↓	↓
36A	Robert Frost	Circle	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
36B	Robert Frost	Circle	Colchester0006.pdf	↓	↓	↓	↓	↓	↓	↓	↓
36C	Robert Frost	Circle	Colchester0007.pdf	↓	↓	↓	↓	↓	↓	↓	↓
36D	Robert Frost	Circle	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
4	Robin	Road	Colchester0000.pdf	↓	N	N	N	N	—	5/21/16	↓
17	Robin	Road	Colchester0001.pdf	↓	↓	↓	↓	↓	—	↓	↓
20	Robin	Road	Colchester0002.pdf	↓	↓	↓	↓	↓	—	↓	↓
34	Robin	Road	Colchester0003.pdf	↓	↓	↓	↓	↓	—	↓	↓
47	Robin	Road	Colchester0004.pdf	↓	↓	↓	↓	↓	—	↓	↓
63	Robin	Road	Colchester0005.pdf	↓	↓	↓	↓	↓	—	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
78	Robin	Road	Colchester0006.pdf	1501-422006	N	N	N	N	—	9/21/16	Premier
87	Robin	Road	Colchester0007.pdf		N	N	N	N	—		
94	Robin	Road	Colchester0008.pdf		N	N	N	N	—		
104	Robin	Road	Colchester0000.pdf		N	N	N	N	—		
19	Roosevelt	Highway	Colchester0000.pdf		N	N	N	N	—	5/26/16	
38	Roosevelt	Highway	Colchester0001.pdf								
70	Roosevelt	Highway	Colchester0003.pdf								
156	Roosevelt	Highway	Colchester0005.pdf								
414	Roosevelt	Highway	Colchester0007.pdf								
416	Roosevelt	Highway	Colchester0009.pdf								
480	Roosevelt	Highway	Colchester0010.pdf								
0553A	Roosevelt	Highway	Colchester0012.pdf								
0553B	Roosevelt	Highway	Colchester0013.pdf								
0623-641	Roosevelt	Highway	Colchester0014.pdf								
875	Roosevelt	Highway	Colchester0018.pdf								
905	Roosevelt	Highway	Colchester0019.pdf								
925	Roosevelt	Highway	Colchester0000.pdf								
947	Roosevelt	Highway	Colchester0000.pdf								
973	Roosevelt	Highway	Colchester0001.pdf								
1007	Roosevelt	Highway	Colchester0002.pdf								
2031	Roosevelt	Highway	Colchester0003.pdf								
3330	Roosevelt	Highway	Colchester0004.pdf								
3424	Roosevelt	Highway	Colchester0000.pdf								
3555	Roosevelt	Highway	Colchester0000.pdf								
3570	Roosevelt	Highway	Colchester0005.pdf								
3595	Roosevelt	Highway	Colchester0000.pdf								
3619	Roosevelt	Highway	Colchester0006.pdf								
3650A	Roosevelt	Highway	Colchester0008.pdf								
3650B	Roosevelt	Highway	Colchester0009.pdf								
3650C	Roosevelt	Highway	Colchester0010.pdf								
3650D	Roosevelt	Highway	Colchester0011.pdf								
3691	Roosevelt	Highway	Colchester0000.pdf								
4200	Roosevelt	Highway	Colchester0012.pdf								
4941	Roosevelt	Highway	Colchester0000.pdf								
4977	Roosevelt	Highway	Colchester0000.pdf								
4977	Roosevelt	Highway	Colchester0001.pdf								
400	Route 7		Colchester0000.pdf								
15	Rudgate	Road	Colchester0000.pdf		N	N	N	N	—	9/19/16	

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
36	Rudgate	Road	Colchester0001.pdf	1501-422006	N	N	N	N	—	9/19/16	Premier
60	Rudgate	Road	Colchester0000.pdf								
66	Rudgate	Road	Colchester0000.pdf								
70	Rudgate	Road	Colchester0003.pdf								
86	Rudgate	Road	Colchester0004.pdf								
87	Rudgate	Road	Colchester0005.pdf								
104	Rudgate	Road	Colchester0006.pdf								
105	Rudgate	Road	Colchester0006.pdf								
123	Rudgate	Road	Colchester0007.pdf								
124	Rudgate	Road	Colchester0008.pdf								
140	Rudgate	Road	Colchester0009.pdf								
141	Rudgate	Road	Colchester0010.pdf								
155	Rudgate	Road	Colchester0011.pdf								
164	Rudgate	Road	Colchester0012.pdf								
180	Rudgate	Road	Colchester0013.pdf								
183	Rudgate	Road	Colchester0014.pdf								
198	Rudgate	Road	Colchester0015.pdf								
199	Rudgate	Road	Colchester0000.pdf								
216	Rudgate	Road	Colchester0016.pdf								
221	Rudgate	Road	Colchester0000.pdf								
235	Rudgate	Road	Colchester0017.pdf								
240	Rudgate	Road	Colchester0018.pdf								
250	Rudgate	Road	Colchester0019.pdf								
268	Rudgate	Road	Colchester0020.pdf								
278	Rudgate	Road	Colchester0021.pdf								
289	Rudgate	Road	Colchester0022.pdf								
302	Rudgate	Road	Colchester0023.pdf								
11	Ryan	Place	Colchester0001.pdf		N	N	N	N	—	9/20/16	
25	Ryan	Place	Colchester0002.pdf								
51	Ryan	Place	Colchester0003.pdf								
53	Ryan	Place	Colchester0000.pdf								
56	Ryan	Place	Colchester0004.pdf								
58	Ryan	Place	Colchester0000.pdf								
330	Ryan	Place	Colchester0005.pdf								
25	Sandy Shore	Terrace	Colchester0000.pdf		N	N	N	N	—	9/22/16	
63	Sandy Shore	Terrace	Colchester.pdf						—		
93	Sandy Shore	Terrace	Colchester0000.pdf						—		
127	Sandy Shore	Terrace	Colchester0000.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
18	Severance	Green	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
42	Severance	Green	Colchester0000.pdf						—		
78	Severance	Green	Colchester0000.pdf						—		
104	Severance	Green	Colchester0000.pdf						—		
98	Severance	Road	Colchester00000000.pdf		N	N	N	N	—	9/28/16	
385	Severance	Road	Colchester0000.pdf								
568	Severance	Road	Colchester0001.pdf								
599	Severance	Road	Colchester0002.pdf								
631	Severance	Road	Colchester0003.pdf								
650	Severance	Road	Colchester0004.pdf								
672	Severance	Road	Colchester0005.pdf								
681	Severance	Road	Colchester0006.pdf								
714	Severance	Road	Colchester0000.pdf								
727	Severance	Road	Colchester0010.pdf								
798	Severance	Road	Colchester0011.pdf								
818	Severance	Road	Colchester0012.pdf								
834	Severance	Road	Colchester0000.pdf								
849	Severance	Road	Colchester0013.pdf								
853	Severance	Road	Colchester0014.pdf								
1121	Severance	Road	Colchester0000.pdf								
1141	Severance	Road	Colchester0016.pdf								
1182	Severance	Road	Colchester0018.pdf								
1194	Severance	Road	Colchester0019.pdf								
1368	Severance	Road	Colchester0020.pdf								
1426	Severance	Road	Colchester0021.pdf								
1460	Severance	Road	Colchester0022.pdf								
1576	Severance	Road	Colchester0023.pdf								
1578	Severance	Road	Colchester0024.pdf								
33	Shady	Lane	Colchester0000.pdf		N	N	N	N	—	9/21/16	
42	Shady	Lane	Colchester0000.pdf								
53	Shady	Lane	Colchester0001.pdf								
73	Shady	Lane	Colchester0000.pdf								
86	Shady	Lane	Colchester0000.pdf								
115	Shady	Lane	Colchester0003.pdf								
118	Shady	Lane	Colchester0004.pdf								
129	Shady	Lane	Colchester0005.pdf								
132	Shady	Lane	Colchester0006.pdf								
145	Shady	Lane	Colchester0007.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
154	Shady	Lane	Colchester0008.pdf	1501-442006	N	N	N	N	—	9/26/16	Premier
163	Shady	Lane	Colchester0009.pdf								
174	Shady	Lane	Colchester0010.pdf								
183	Shady	Lane	Colchester0011.pdf								
194	Shady	Lane	Colchester0012.pdf								
213	Shady	Lane	Colchester0014.pdf								
228	Shady	Lane	Colchester0015.pdf								
237	Shady	Lane	Colchester0016.pdf								
246	Shady	Lane	Colchester0000.pdf								
255	Shady	Lane	Colchester0017.pdf								
266	Shady	Lane	Colchester0018.pdf								
279	Shady	Lane	Colchester0019.pdf								
284	Shady	Lane	Colchester0020.pdf								
322	Shady	Lane	Colchester0021.pdf								
342	Shady	Lane	Colchester0000.pdf								
356	Shady	Lane	Colchester0000.pdf								
370	Shady	Lane	Colchester0022.pdf								
376	Shady	Lane	Colchester0023.pdf								
386	Shady	Lane	Colchester0024.pdf								
396	Shady	Lane	Colchester0025.pdf								
420	Shady	Lane	Colchester0026.pdf								
16	Shetland	Lane	Colchester0000.pdf		N	N	N	N	—	9/26/16	
21	Shetland	Lane	Colchester0002.pdf								
27	Shetland	Lane	Colchester0004.pdf								
37	Shetland	Lane	Colchester0006.pdf								
42	Shetland	Lane	Colchester0008.pdf								
49	Shetland	Lane	Colchester0010.pdf								
69	Shetland	Lane	Colchester0012.pdf								
76	Shetland	Lane	Colchester0013.pdf								
78	Shetland	Lane	Colchester0015.pdf								
82	Shetland	Lane	Colchester0017.pdf								
24	Shore Acres	Drive	Colchester0003.pdf		N	N	N	N	—	9/22/16	
44	Shore Acres	Drive	Colchester0000.pdf								
81	Shore Acres	Drive	Colchester0000.pdf								
82	Shore Acres	Drive	Colchester0000.pdf								
106	Shore Acres	Drive	Colchester0000.pdf								
107	Shore Acres	Drive	Colchester0000.pdf								
138	Shore Acres	Drive	Colchester0000.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
197	Shore Acres	Drive	Colchester.pdf	1501-422006 ✓	N	N	N	N	—	9/22/16	Premier
214	Shore Acres	Drive	Colchester0000.pdf								
263	Shore Acres	Drive	Colchester0000.pdf								
303	Shore Acres	Drive	Colchester0000.pdf								
304	Shore Acres	Drive	Colchester0000.pdf								
351	Shore Acres	Drive	Colchester0000.pdf								
373	Shore Acres	Drive	Colchester0000.pdf								
411	Shore Acres	Drive	Colchester0000.pdf								
436	Shore Acres	Drive	Colchester0000.pdf								
484	Shore Acres	Drive	Colchester0000.pdf								
512	Shore Acres	Drive	Colchester0000.pdf								
519	Shore Acres	Drive	Colchester0000.pdf								
534	Shore Acres	Drive	Colchester0000.pdf								
581	Shore Acres	Drive	Colchester0000.pdf								
663	Shore Acres	Drive	Colchester0000.pdf								
683	Shore Acres	Drive	Colchester0000.pdf								
688	Shore Acres	Drive	Colchester0000.pdf								
717	Shore Acres	Drive	Colchester0000.pdf								
748	Shore Acres	Drive	Colchester0000.pdf								
751	Shore Acres	Drive	Colchester0000.pdf								
764	Shore Acres	Drive	Colchester0000.pdf								
798	Shore Acres	Drive	Colchester0000.pdf								
827	Shore Acres	Drive	Colchester0000.pdf								
842	Shore Acres	Drive	Colchester0000.pdf								
849	Shore Acres	Drive	Colchester0000.pdf								
9	Smith	Road	Colchester0000.pdf		N	N	N	N	—	9/20/16	
17	Smith	Road	Colchester0001.pdf								
21	Smith	Road	Colchester0002.pdf								
26	Smith	Road	Colchester0003.pdf								
27	Smith	Road	Colchester0004.pdf								
39	Smith	Road	Colchester0005.pdf								
45	Smith	Road	Colchester0006.pdf								
48	Smith	Road	Colchester0007.pdf								
74	Smith	Road	Colchester0008.pdf								
101	Smith	Road	Colchester0009.pdf								
107	Smith	Road	Colchester0010.pdf								
109	Smith	Road	Colchester0011.pdf								
138	Smith	Road	Colchester0012.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
55	South Bay	Circle	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
64	South Bay	Circle	Colchester0001.pdf								
78	South Bay	Circle	Colchester0000.pdf								
85	South Bay	Circle	Colchester0002.pdf								
95	South Bay	Circle	Colchester0003.pdf								
100	South Bay	Circle	Colchester0004.pdf								
119	South Bay	Circle	Colchester0005.pdf								
124	South Bay	Circle	Colchester0006.pdf								
140	South Bay	Circle	Colchester0007.pdf								
145	South Bay	Circle	Colchester0008.pdf								
167	South Bay	Circle	Colchester0009.pdf								
170	South Bay	Circle	Colchester0010.pdf								
198	South Bay	Circle	Colchester0011.pdf								
203	South Bay	Circle	Colchester0012.pdf								
214	South Bay	Circle	Colchester0013.pdf								
244	South Bay	Circle	Colchester0000.pdf								
306	South Bay	Circle	Colchester0000.pdf								
313	South Bay	Circle	Colchester0000.pdf								
324	South Bay	Circle	Colchester0015.pdf								
341	South Bay	Circle	Colchester0016.pdf								
362	South Bay	Circle	Colchester0000.pdf								
371	South Bay	Circle	Colchester0017.pdf								
384	South Bay	Circle	Colchester0018.pdf								
390	South Bay	Circle	Colchester0019.pdf								
397	South Bay	Circle	Colchester0020.pdf								
415	South Bay	Circle	Colchester0000.pdf								
435	South Bay	Circle	Colchester0000.pdf								
438	South Bay	Circle	Colchester0021.pdf								
458	South Bay	Circle	Colchester0022.pdf								
464	South Bay	Circle	Colchester0023.pdf								
486	South Bay	Circle	Colchester0024.pdf								
493	South Bay	Circle	Colchester0000.pdf								
508	South Bay	Circle	Colchester0000.pdf								
523	South Bay	Circle	Colchester0000.pdf								
534	South Bay	Circle	Colchester0025.pdf								
550	South Bay	Circle	Colchester0026.pdf								
564	South Bay	Circle	Colchester0027.pdf								
570	South Bay	Circle	Colchester0028.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
585	South Bay	Circle	Colchester0029.pdf	1501-442006	N	N	N	N	—	9/27/16	Premier
598	South Bay	Circle	Colchester0030.pdf								
61	South Oak	Circle	Colchester0000.pdf							↓	
94	South Oak	Circle	Colchester0002.pdf							9/28/16	
170	South Oak	Circle	Colchester0003.pdf								
208	South Oak	Circle	Colchester0004.pdf								
226	South Oak	Circle	Colchester0005.pdf								
33	South Park	Drive	Colchester0000.pdf							↓	
44	South Park	Drive	Colchester0001.pdf							9/29/16	
74	South Park	Drive	Colchester0002.pdf								
84	South Park	Drive	Colchester0003.pdf								
85	South Park	Drive	Colchester0005.pdf								
208	South Park	Drive	Colchester0000.pdf								
208	South Park	Drive	Colchester0006.pdf								
220	South Park	Drive	Colchester0007.pdf								
245	South Park	Drive	Colchester0000.pdf		↓	↓	↓	↓	↓	↓	
3	Spaulding Bay	Court	Colchester0000.pdf		N	N	N	N	—	9/30/16	
33	Spaulding Bay	Court	Colchester0001.pdf								
57	Spaulding Bay	Court	Colchester0000.pdf								
64	Spaulding Bay	Court	Colchester0002.pdf								
66	Spaulding Bay	Court	Colchester0000.pdf								
30	Spaulding East	Shore	Colchester0000.pdf								
32	Spaulding East	Shore	Colchester0001.pdf								
46	Spaulding East	Shore	Colchester0002.pdf								
67	Spaulding East	Shore	Colchester0004.pdf								
88	Spaulding East	Shore	Colchester0005.pdf								
95	Spaulding East	Shore	Colchester0006.pdf								
108	Spaulding East	Shore	Colchester0007.pdf								
111	Spaulding East	Shore	Colchester0008.pdf								
122	Spaulding East	Shore	Colchester0009.pdf								
143	Spaulding East	Shore	Colchester0010.pdf								
148	Spaulding East	Shore	Colchester0011.pdf								
150A	Spaulding East	Shore	Colchester0012.pdf								
150B	Spaulding East	Shore	Colchester0000.pdf		↓	↓	↓	↓	↓	↓	
10	Starboard	Way	Colchester0000.pdf		N	N	N	N	—		
17	Starboard	Way	Colchester0000.pdf		N	N	N	N	—		
012-14	Stone	Drive	Colchester0000.pdf		N	N	N	N	—	9/26/16	
023-25	Stone	Drive	Colchester0001.pdf	↓	N	N	N	N	—	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
032-34	Stone	Drive	Colchester0002.pdf	1501-422006	N	N	N	N	—	9/26/16	Premier
056-58	Stone	Drive	Colchester0003.pdf								
057-59	Stone	Drive	Colchester0004.pdf								
078-80	Stone	Drive	Colchester0005.pdf								
079-81	Stone	Drive	Colchester0006.pdf								
102-104	Stone	Drive	Colchester0007.pdf								
107-109	Stone	Drive	Colchester0008.pdf								
125	Stone	Drive	Colchester0009.pdf								
126-128	Stone	Drive	Colchester0010.pdf								
158-166	Stone	Drive	Colchester0011.pdf								
182-190	Stone	Drive	Colchester0012.pdf								
197	Stone	Drive	Colchester0013.pdf								
204-210	Stone	Drive	Colchester0014.pdf								
230	Stone	Drive	Colchester0015.pdf								
252	Stone	Drive	Colchester0016.pdf								
261	Stone	Drive	Colchester0017.pdf								
270	Stone	Drive	Colchester0018.pdf								
283	Stone	Drive	Colchester0019.pdf								
296	Stone	Drive	Colchester0000.pdf								
323	Stone	Drive	Colchester0021.pdf								
334	Stone	Drive	Colchester0022.pdf								
343	Stone	Drive	Colchester0023.pdf								
34	Student	Lane	Colchester0000.pdf		N	N	N	N	—	9/28/16	
54-56	Student	Lane	Colchester0001.pdf		N	N	N	N	—		
65-103-172-176	Sullivan	Lane	Colchester0001.pdf		N	N	N	N	—	4/29/16	
	Sullivan	Lane	Colchester0000.pdf		N	N	N	N	—		
29	Summitt	Ridge	Colchester0000.pdf		N	N	N	N	—	9/23/16	
43	Summitt	Ridge	Colchester0000.pdf						—		
70	Summitt	Ridge	Colchester0000.pdf						—		
16	Sunderland Woods	Road	Colchester0000.pdf		N	N	N	N	—	9/28/16	
63	Sunderland Woods	Road	Colchester0000.pdf								
65	Sunderland Woods	Road	Colchester0000.pdf								
167	Sunderland Woods	Road	Colchester0003.pdf								
197	Sunderland Woods	Road	Colchester0005.pdf								
213	Sunderland Woods	Road	Colchester0007.pdf								
237	Sunderland Woods	Road	Colchester0009.pdf								
238	Sunderland Woods	Road	Colchester0011.pdf								
259	Sunderland Woods	Road	Colchester0013.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
260	Sunderland Woods	Road	Colchester0015.pdf	1501-422006	N	N	N	N	—	9/20/16	Premier
276	Sunderland Woods	Road	Colchester0017.pdf								
277	Sunderland Woods	Road	Colchester0020.pdf								
298	Sunderland Woods	Road	Colchester0022.pdf								
299	Sunderland Woods	Road	Colchester0024.pdf								
318	Sunderland Woods	Road	Colchester0026.pdf								
321	Sunderland Woods	Road	Colchester0028.pdf								
333	Sunderland Woods	Road	Colchester0030.pdf								
349	Sunderland Woods	Road	Colchester0032.pdf								
363	Sunderland Woods	Road	Colchester0034.pdf								
383	Sunderland Woods	Road	Colchester0035.pdf								
384	Sunderland Woods	Road	Colchester0037.pdf								
404	Sunderland Woods	Road	Colchester0039.pdf								
415	Sunderland Woods	Road	Colchester0041.pdf								
433	Sunderland Woods	Road	Colchester0043.pdf								
436	Sunderland Woods	Road	Colchester0045.pdf								
442	Sunderland Woods	Road	Colchester0047.pdf								
449	Sunderland Woods	Road	Colchester0049.pdf								
473	Sunderland Woods	Road	Colchester0051.pdf								
489	Sunderland Woods	Road	Colchester0053.pdf								
507	Sunderland Woods	Road	Colchester0054.pdf								
536	Sunderland Woods	Road	Colchester0057.pdf								
560	Sunderland Woods	Road	Colchester0059.pdf								
578	Sunderland Woods	Road	Colchester0061.pdf								
8	Sunset	Drive	Colchester0000.pdf		N	N	N	N	—	9/14/16	
15	Sunset	Drive	Colchester0001.pdf								
36	Sunset	Drive	Colchester0000.pdf								
37	Sunset	Drive	Colchester0002.pdf								
53	Sunset	Drive	Colchester0003.pdf								
60	Sunset	Drive	Colchester0004.pdf								
82	Sunset	Drive	Colchester0005.pdf								
109	Sunset	Drive	Colchester00050000.pdf								
23	Tanglewood	Drive	Colchester0000.pdf		N	N	N	N	—	9/19/16	
26	Tanglewood	Drive	Colchester0000.pdf								
42	Tanglewood	Drive	Colchester0002.pdf								
45	Tanglewood	Drive	Colchester0003.pdf								
81	Tanglewood	Drive	Colchester0005.pdf								
96	Tanglewood	Drive	Colchester0006.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
101	Tanglewood	Drive	Colchester0007.pdf	1501-Arrow	N	N	N	N	—	9/19/16	Premier
110	Tanglewood	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
124	Tanglewood	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
127	Tanglewood	Drive	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
148	Tanglewood	Drive	Colchester0009.pdf	↓	↓	↓	↓	↓	↓	↓	↓
151	Tanglewood	Drive	Colchester0010.pdf	↓	↓	↓	↓	↓	↓	↓	↓
165	Tanglewood	Drive	Colchester0011.pdf	↓	↓	↓	↓	↓	↓	↓	↓
170	Tanglewood	Drive	Colchester0012.pdf	↓	↓	↓	↓	↓	↓	↓	↓
192	Tanglewood	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
27-29	Thayer Bay	Circle	Colchester0000.pdf	↓	N	N	N	N	—	9/20/16	↓
33-35	Thayer Bay	Circle	Colchester0001.pdf	↓	↓	↓	↓	↓	—	↓	↓
44-46	Thayer Bay	Circle	Colchester0002.pdf	↓	↓	↓	↓	↓	—	↓	↓
47-49	Thayer Bay	Circle	Colchester0003.pdf	↓	↓	↓	↓	↓	—	↓	↓
48-50	Thayer Bay	Circle	Colchester0004.pdf	↓	↓	↓	↓	↓	—	↓	↓
52-54	Thayer Bay	Circle	Colchester0005.pdf	↓	↓	↓	↓	↓	—	↓	↓
30	Thayer Bay	Road	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
32	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
46	Thayer Bay	Road	Colchester0001.pdf	↓	↓	↓	↓	↓	↓	↓	↓
48	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
68	Thayer Bay	Road	Colchester0002.pdf	↓	↓	↓	↓	↓	↓	↓	↓
70	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
112	Thayer Bay	Road	Colchester0003.pdf	↓	↓	↓	↓	↓	↓	↓	↓
114	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
185	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
187	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
187	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
189A	Thayer Bay	Road	Colchester.pdf	↓	↓	↓	↓	↓	↓	↓	↓
189B	Thayer Bay	Road	Colchester.pdf	↓	↓	↓	↓	↓	↓	↓	↓
189C	Thayer Bay	Road	Colchester.pdf	↓	↓	↓	↓	↓	↓	↓	↓
233	Thayer Bay	Road	Colchester0005.pdf	↓	↓	↓	↓	↓	↓	↓	↓
235	Thayer Bay	Road	Colchester0007.pdf	↓	↓	↓	↓	↓	↓	↓	↓
249	Thayer Bay	Road	Colchester0008.pdf	↓	↓	↓	↓	↓	↓	↓	↓
304	Thayer Bay	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
310	Thayer Bay	Road	Colchester0009.pdf	↓	↓	↓	↓	↓	↓	↓	↓
10	Thayer Beach	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/22/16	↓
282	Thayer Beach	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
302	Thayer Beach	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
310	Thayer Beach	Road	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
370	Thayer Beach	Road	Colchester0000.pdf	1501-922006	N	N	N	N	—	9/20/16	Premier
414	Thayer Beach	Road	Colchester0000.pdf						—		
428	Thayer Beach	Road	Colchester0000.pdf						—		
445	Thayer Beach	Road	Colchester0000.pdf						—		
481	Thayer Beach	Road	Colchester0000.pdf						—		
561	Thayer Beach	Road	Colchester0000.pdf						—		
590	Thayer Beach	Road	Colchester0000.pdf						—		
615	Thayer Beach	Road	Colchester0000.pdf						—		
12	Thibault	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
42	Thibault	Drive	Colchester0001.pdf								
45	Thibault	Drive	Colchester0002.pdf								
69	Thibault	Drive	Colchester0000.pdf								
72	Thibault	Drive	Colchester0004.pdf								
90	Thibault	Drive	Colchester0005.pdf								
106	Thibault	Drive	Colchester0006.pdf								
141	Thibault	Drive	Colchester0007.pdf								
142	Thibault	Drive	Colchester0008.pdf								
27	Thomas	Drive	Colchester0000.pdf		N	N	N	N	—	9/20/16	
28	Thomas	Drive	Colchester0001.pdf								
33	Thomas	Drive	Colchester0002.pdf								
75	Thomas	Drive	Colchester0003.pdf								
80	Thomas	Drive	Colchester0004.pdf								
87	Thomas	Drive	Colchester0000.pdf								
102	Thomas	Drive	Colchester0005.pdf								
107	Thomas	Drive	Colchester0006.pdf								
129	Thomas	Drive	Colchester0007.pdf								
132	Thomas	Drive	Colchester0000.pdf								
151	Thomas	Drive	Colchester0009.pdf								
18	Timberlake	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
19	Timberlake	Drive	Colchester0000.pdf								
32	Timberlake	Drive	Colchester0001.pdf								
053-55	Timberlake	Drive	Colchester0002.pdf								
71	Timberlake	Drive	Colchester0003.pdf								
89	Timberlake	Drive	Colchester0004.pdf								
110	Timberlake	Drive	Colchester0000.pdf								
130	Timberlake	Drive	Colchester0005.pdf								
133	Timberlake	Drive	Colchester0006.pdf								
162	Timberlake	Drive	Colchester0007.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
165	Timberlake	Drive	Colchester0008.pdf	1501-422006	N	N	N	N	—	9/21/16	Premier
184	Timberlake	Drive	Colchester0000.pdf								
197	Timberlake	Drive	Colchester0000.pdf								
214	Timberlake	Drive	Colchester0009.pdf		↓	↓	↓	↓	↓	↓	
11	Tower Ridge	Circle	Colchester0000.pdf		N	N	N	N	—	9/22/16	
12	Tower Ridge	Circle	Colchester0001.pdf								
28	Tower Ridge	Circle	Colchester0002.pdf								
40	Tower Ridge	Circle	Colchester0003.pdf								
50	Tower Ridge	Circle	Colchester0004.pdf								
64	Tower Ridge	Circle	Colchester0005.pdf		↓	↓	↓	↓	↓	↓	
15	Tracy	Road	Colchester0000.pdf		N	N	N	N	—	9/25/16	
51	Tracy	Road	Colchester0000.pdf						—		
74	Tracy	Road	Colchester0000.pdf						—		
132	Tracy	Road	Colchester0000.pdf		↓	↓	↓	↓	—	↓	
20	Troy	Avenue	Colchester0001.pdf		N	N	N	N	—	9/29/16	
46	Troy	Avenue	Colchester0002.pdf								
365	Troy	Avenue	Colchester0003.pdf								
366	Troy	Avenue	Colchester0004.pdf								
429	Troy	Avenue	Colchester0005.pdf								
512	Troy	Avenue	Colchester0006.pdf								
1610	Troy	Avenue	Colchester0000.pdf		↓	↓	↓	↓	↓	↓	
15	Truman	Drive	Colchester0000.pdf		N	N	N	N	—	9/29/16	
29	Truman	Drive	Colchester0001.pdf								
38A	Truman	Drive	Colchester0002.pdf								
38B	Truman	Drive	Colchester0003.pdf								
38C	Truman	Drive	Colchester0004.pdf								
39	Truman	Drive	Colchester0005.pdf		↓	↓	↓	↓	↓	↓	
18	Turquoise	Drive	Colchester0000.pdf		N	N	N	N	—	9/21/16	
44	Turquoise	Drive	Colchester0001.pdf								
47	Turquoise	Drive	Colchester0000.pdf								
65	Turquoise	Drive	Colchester0002.pdf								
82	Turquoise	Drive	Colchester0003.pdf								
83	Turquoise	Drive	Colchester0000.pdf		↓	↓	↓	↓	↓	↓	
21	University	Lane	Colchester0000.pdf		N	N	N	N	—		
32	University	Lane	Colchester0001.pdf						—		
34	University	Lane	Colchester0002.pdf						—		
35	University	Lane	Colchester0003.pdf		↓	↓	↓	↓	—		
13	Valiquette	Court	Colchester0000.pdf	↓	N	N	N	N	—	9/21/16	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
248	Village	Drive	Colchester0011.pdf	1501-442006	N	N	N	N	—	9/27/16	Premier
259	Village	Drive	Colchester0000.pdf								
276	Village	Drive	Colchester0012.pdf								
279	Village	Drive	Colchester0000.pdf								
293	Village	Drive	Colchester0013.pdf								
298	Village	Drive	Colchester0014.pdf								
312	Village	Drive	Colchester0000.pdf								
316	Village	Drive	Colchester0015.pdf								
324	Village	Drive	Colchester0016.pdf								
330	Village	Drive	Colchester0017.pdf								
410	Village	Drive	Colchester0018.pdf								
2	Village	Drive	Colchester0002.pdf								
12	Wall	Street	Colchester0000.pdf		N	N	N	N	—	9/28/16	
23	Wall	Street	Colchester0001.pdf								
78	Wall	Street	Colchester0002.pdf								
99	Wall	Street	Colchester0003.pdf								
107	Wall	Street	Colchester0004.pdf								
142	Wall	Street	Colchester0005.pdf								
159	Wall	Street	Colchester0006.pdf								
206	Wall	Street	Colchester0008.pdf								
218	Wall	Street	Colchester0000.pdf								
241	Wall	Street	Colchester0000.pdf								
250	Wall	Street	Colchester0000.pdf								
274	Wall	Street	Colchester0000.pdf								
299	Wall	Street	Colchester0009.pdf								
306	Wall	Street	Colchester0010.pdf								
339	Wall	Street	Colchester0000.pdf								
340	Wall	Street	Colchester0011.pdf								
150	Water Tower	Circle	Colchester0001.pdf		N	N	N	N	—	9/28/16	
336	Water Tower	Circle	Colchester0002.pdf						—		
401	Water Tower	Circle	Colchester0003.pdf						—		
402	Water Tower	Circle	Colchester0004.pdf						—		
434	Water Tower	Circle	Colchester0004.pdf						—		
441	Water Tower	Circle	Colchester0005.pdf						—		
105-109	Waterlefe	Way	Colchester0000.pdf		N	N	N	N	—	9/26/16	
153-157	Waterlefe	Way	Colchester0000.pdf						—		
193	Waterlefe	Way	Colchester.pdf						—		
194	Waterlefe	Way	Colchester0000.pdf						—		

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
78	Valleyfield	Drive	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/20/16	Premier
12	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
151	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
163	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
175	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
177	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
187	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
199	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
201	Valleyfield	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
28	Vermont	Avenue	Colchester0003.pdf	↓	N	N	N	N	—	9/29/16	↓
77	Vermont	Avenue	Colchester0000.pdf	↓	N	N	N	N	—	↓	↓
1004	VT National Guard	Road	Colchester.pdf	↓					CGT Denied Access on Base	9/29/16	↓
670	VT National Guard	Road	Colchester.pdf	↓					↓	↓	↓
789	VT National Guard	Road	Colchester.pdf	↓					↓	↓	↓
790	VT National Guard	Road	Colchester.pdf	↓					↓	↓	↓
	Guard	Road	Colchester.pdf	↓					↓	↓	↓
			ter.pdf	↓					↓	↓	↓
114	Village	Drive									
115	Village	Drive	Colchester0004.pdf	↓	↓	↓	↓	↓		↓	↓
132	Village	Drive	Colchester0005.pdf	↓	↓	↓	↓	↓		↓	↓
145	Village	Drive	Colchester0006.pdf	↓	↓	↓	↓	↓	—	↓	↓
150	Village	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
206	Village	Drive	Colchester0007.pdf	↓	↓	↓	↓	↓	—	↓	↓
228	Village	Drive	Colchester0009.pdf	↓	↓	↓	↓	↓	—	↓	↓
237	Village	Drive	Colchester0010.pdf	↓	↓	↓	↓	↓	—	↓	↓

see next page

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
50	Waybury	Road	Colchester0000.pdf	1501-422006	N	N	N	N	—	9/19/16	Premier
57	Waybury	Road	Colchester0001.pdf								
75	Waybury	Road	Colchester0002.pdf								
87	Waybury	Road	Colchester0003.pdf								
97	Waybury	Road	Colchester0004.pdf								
116	Waybury	Road	Colchester0005.pdf								
127	Waybury	Road	Colchester0006.pdf								
147	Waybury	Road	Colchester0000.pdf								
167	Waybury	Road	Colchester0007.pdf								
183	Waybury	Road	Colchester0008.pdf								
199	Waybury	Road	Colchester0009.pdf								
215	Waybury	Road	Colchester0010.pdf								
38	W. Lakeshore	Drive	Colchester0001.pdf		N	N	N	N	—	9/21/16	
76	W. Lakeshore	Drive	Colchester0002.pdf								
105	W. Lakeshore	Drive	Colchester0003.pdf								
0135A	W. Lakeshore	Drive	Colchester0004.pdf								
0135B	W. Lakeshore	Drive	Colchester0005.pdf								
0135C	W. Lakeshore	Drive	Colchester0006.pdf								
0135D	W. Lakeshore	Drive	Colchester0007.pdf								
180	W. Lakeshore	Drive	Colchester0008.pdf								
203	W. Lakeshore	Drive	Colchester0009.pdf								
227	W. Lakeshore	Drive	Colchester0010.pdf								
278	W. Lakeshore	Drive	Colchester0000.pdf								
288	W. Lakeshore	Drive	Colchester0012.pdf								
298	W. Lakeshore	Drive	Colchester0000.pdf								
310	W. Lakeshore	Drive	Colchester0000.pdf								
318	W. Lakeshore	Drive	Colchester0000.pdf								
371	W. Lakeshore	Drive	Colchester0016.pdf								
419	W. Lakeshore	Drive	Colchester0017.pdf								
449	W. Lakeshore	Drive	Colchester0018.pdf								
541	W. Lakeshore	Drive	Colchester0019.pdf								
546	W. Lakeshore	Drive	Colchester0000.pdf								
549	W. Lakeshore	Drive	Colchester0020.pdf								
558	W. Lakeshore	Drive	Colchester0000.pdf								
570	W. Lakeshore	Drive	Colchester0022.pdf								
586	W. Lakeshore	Drive	Colchester0000.pdf								
598	W. Lakeshore	Drive	Colchester0023.pdf								
657	W. Lakeshore	Drive	Colchester0026.pdf								

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
662	W. Lakeshore	Drive	Colchester0027.pdf	1501-422006	N	N	N	N	—	9/21/16	Premier
713	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
760	W. Lakeshore	Drive	Colchester0028.pdf	↓	↓	↓	↓	↓	↓	↓	↓
777	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
0794A	W. Lakeshore	Drive	Colchester0030.pdf	↓	↓	↓	↓	↓	↓	↓	↓
0794B	W. Lakeshore	Drive	Colchester0031.pdf	↓	↓	↓	↓	↓	↓	↓	↓
0824A	W. Lakeshore	Drive	Colchester0032.pdf	↓	↓	↓	↓	↓	↓	↓	↓
0824B	W. Lakeshore	Drive	Colchester0033.pdf	↓	↓	↓	↓	↓	↓	↓	↓
851	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
955	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1022	W. Lakeshore	Drive	Colchester0035.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1098	W. Lakeshore	Drive	Colchester0037.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1291	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1329	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1383	W. Lakeshore	Drive	Colchester0038.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1407	W. Lakeshore	Drive	Colchester0039.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1431	W. Lakeshore	Drive	Colchester0040.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1447	W. Lakeshore	Drive	Colchester0041.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1473	W. Lakeshore	Drive	Colchester0042.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1495	W. Lakeshore	Drive	Colchester0043.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1517	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1601	W. Lakeshore	Drive	Colchester0045.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1647	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1672	W. Lakeshore	Drive	Colchester0046.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1694	W. Lakeshore	Drive	Colchester0047.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1750	W. Lakeshore	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1775	W. Lakeshore	Drive	Colchester0048.pdf	↓	↓	↓	↓	↓	↓	↓	↓
1821	W. Lakeshore	Drive	Colchester0049.pdf	↓	↓	↓	↓	↓	↓	↓	↓
11	W. Porters Point	Road	Colchester0000.pdf	Road	N	N	N	N	—	9/22/16	↓
46	W. Porters Point	Road	Colchester0000.pdf	Road	↓	↓	↓	↓	—	↓	↓
121	W. Porters Point	Road	Colchester0001.pdf	Road	↓	↓	↓	↓	—	↓	↓
105	W. View	Road	Colchester0000.pdf	↓	N	N	N	N	—	9/26/16	↓
44	Westward	Drive	Colchester0000.pdf	↓	N	N	N	N	—	9/27/16	↓
117	Westward	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓
130	Westward	Drive	Colchester0001.pdf	↓	↓	↓	↓	↓	—	↓	↓
159	Westward	Drive	Colchester0002.pdf	↓	↓	↓	↓	↓	—	↓	↓
181	Westward	Drive	Colchester0003.pdf	↓	↓	↓	↓	↓	—	↓	↓
205	Westward	Drive	Colchester0000.pdf	↓	↓	↓	↓	↓	—	↓	↓

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
212	Westward	Drive	Colchester0004.pdf	i501A22006	N	N	N	N	—	9/27/16	Premier
222	Westward	Drive	Colchester0005.pdf								
256	Westward	Drive	Colchester0000.pdf								
266	Westward	Drive	Colchester0000.pdf								
274	Westward	Drive	Colchester0006.pdf								
289	Westward	Drive	Colchester0007.pdf								
294	Westward	Drive	Colchester0008.pdf								
307	Westward	Drive	Colchester0009.pdf								
316	Westward	Drive	Colchester0010.pdf								
338	Westward	Drive	Colchester0011.pdf								
354	Westward	Drive	Colchester0012.pdf								
41	Wheatley	Court	Colchester0000.pdf		N	N	N	N	~	9/19/16	
42	Wheatley	Court	Colchester0001.pdf								
065-067	Wheatley	Court	Colchester0002.pdf								
070-072	Wheatley	Court	Colchester0003.pdf								
88	Wheatley	Court	Colchester0004.pdf								
90	Wheatley	Court	Colchester0005.pdf								
101-103	Wheatley	Court	Colchester0000.pdf								
108	Wheatley	Court	Colchester0000.pdf								
116	Whitcomb	Street	Colchester0000.pdf		N	N	N	N	—	9/28/16	
9 thru 11	White Lilac	Way	Colchester0000.pdf						—		
19-21	White Lilac	Way	Colchester0001.pdf						—		
29-31	White Lilac	Way	Colchester0002.pdf						—		
39-41	White Lilac	Way	Colchester0003.pdf						—		
30	Whitecap	Road	Colchester0000.pdf		N	N	N	N	—	9/19/16	
36	Whitecap	Road	Colchester0000.pdf								
55	Whitecap	Road	Colchester0000.pdf								
68	Whitecap	Road	Colchester0000.pdf								
154	Whitecap	Road	Colchester0000.pdf								
160	Whitecap	Road	Colchester0000.pdf								
205	Whitecap	Road	Colchester0000.pdf								
208	Whitecap	Road	Colchester0000.pdf								
210	Whitecap	Road	Colchester0000.pdf								
236	Whitecap	Road	Colchester0000.pdf								
262	Whitecap	Road	Colchester0000.pdf								
281	Whitecap	Road	Colchester0000.pdf								
303	Whitecap	Road	Colchester0000.pdf								
21	Wiley	Road	Colchester0000.pdf		N	N	N	N	—	9/22/16	

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
120	Wiley	Road	Colchester0001.pdf	1501-422006	N	N	N	N	—	9/26/16	Premier
160	Wiley	Road	Colchester0002.pdf	↓	↓	↓	↓	↓	—	↓	↓
87	Williams	Road	Colchester0000.pdf		N	N	N	N	—	9/27/16	
89	Williams	Road	Colchester0000.pdf								
0091-93	Williams	Road	Colchester0001.pdf								
127	Williams	Road	Colchester0002.pdf								
149	Williams	Road	Colchester0004.pdf								
177	Williams	Road	Colchester0005.pdf								
243	Williams	Road	Colchester0006.pdf								
273	Williams	Road	Colchester0007.pdf								
275	Williams	Road	Colchester0008.pdf								
356	Williams	Road	Colchester0009.pdf								
388	Williams	Road	Colchester0010.pdf								
422	Williams	Road	Colchester0011.pdf								
435	Williams	Road	Colchester0012.pdf								
476	Williams	Road	Colchester0014.pdf								
483	Williams	Road	Colchester0015.pdf								
518	Williams	Road	Colchester0016.pdf								
550	Williams	Road	Colchester0018.pdf								
574	Williams	Road	Colchester0019.pdf								
612	Williams	Road	Colchester0020.pdf								
0619-621	Williams	Road	Colchester0000.pdf								
0619-621	Williams	Road	Colchester0021.pdf								
650	Williams	Road	Colchester0000.pdf								
674	Williams	Road	Colchester0022.pdf								
730	Williams	Road	Colchester0023.pdf								
754	Williams	Road	Colchester0026.pdf								
0881-883	Williams	Road	Colchester0027.pdf								
0899-901	Williams	Road	Colchester.pdf								
916	Williams	Road	Colchester0028.pdf								
916	Williams	Road	Colchester0000.pdf								
948	Williams	Road	Colchester0029.pdf								
963	Williams	Road	Colchester0032.pdf								
965	Williams	Road	Colchester0031.pdf								
993	Williams	Road	Colchester0034.pdf								
995	Williams	Road	Colchester0035.pdf								
1006	Williams	Road	Colchester0000.pdf								
1018	Williams	Road	Colchester0037.pdf	↓	↓	↓	↓	↓	↓	↓	↓

Service Address			City/Town	FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
1035	Williams	Road	Colchester0038.pdf	1501-422006	N	N	N	N	—	9/27/16	Premier
1037A	Williams	Road	Colchester0000.pdf						—		
1037B	Williams	Road	Colchester0000.pdf						—		
1040	Williams	Road	Colchester0039.pdf						—		
1050	Williams	Road	Colchester0041.pdf						—		
20	Willow	Circle	Colchester.pdf		N	N	N	N	—	9/28/16	
40	Willow	Circle	Colchester.pdf						—		
46	Willow	Circle	Colchester.pdf						—		
50	Willow	Circle	Colchester.pdf						—		
018B	Windemere	Way	Colchester0000.pdf		N	N	N	N	—	9/19/16	
27	Windemere	Way	Colchester0001.pdf								
30	Windemere	Way	Colchester0002.pdf								
54	Windemere	Way	Colchester0003.pdf								
59	Windemere	Way	Colchester0004.pdf								
81	Windemere	Way	Colchester0005.pdf								
94	Windemere	Way	Colchester0000.pdf								
103	Windemere	Way	Colchester0006.pdf								
116	Windemere	Way	Colchester.pdf								
130	Windemere	Way	Colchester0007.pdf								
164	Windemere	Way	Colchester0008.pdf								
183	Windemere	Way	Colchester0009.pdf								
190	Windemere	Way	Colchester0010.pdf								
212	Windemere	Way	Colchester0000.pdf								
257	Windemere	Way	Colchester0011.pdf								
334	Windemere	Way	Colchester0000.pdf								
362	Windemere	Way	Colchester0000.pdf								
375	Windemere	Way	Colchester0000.pdf								
390	Windemere	Way	Colchester0013.pdf								
419	Windemere	Way	Colchester0014.pdf								
469	Windemere	Way	Colchester0015.pdf								
531	Windemere	Way	Colchester0016.pdf								
549	Windemere	Way	Colchester0017.pdf								
562	Windemere	Way	Colchester0000.pdf								
596	Windemere	Way	Colchester0018.pdf								
644	Windemere	Way	Colchester0019.pdf								
22	Windswept	Drive	Colchester0000.pdf		N	N	N	N	—	9/26/16	
37	Windswept	Drive	Colchester0001.pdf						—		
38	Windswept	Drive	Colchester0002.pdf						—		

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
56	Windswept	Drive	Colchester0003.pdf	1501- Arrowle	N	N	N	N	—	9/26/16	Premier
67	Windswept	Drive	Colchester0004.pdf						—		
70	Windswept	Drive	Colchester0005.pdf						—		
86	Windswept	Drive	Colchester0006.pdf						—		
87	Windswept	Drive	Colchester0007.pdf						—		
106	Windswept	Drive	Colchester0008.pdf						—		
107	Windswept	Drive	Colchester0009.pdf						—		
127	Windswept	Drive	Colchester0010.pdf						—		
30	Windy	Lane	Colchester0010.pdf		N	N	N	N	—	9/26/16	
36	Windy	Lane	Colchester0010.pdf						—		
62	Windy	Lane	Colchester0010.pdf						—		
64	Windy	Lane	Colchester0010.pdf						—		
	Winooski	Park	Colchester0000.pdf		N	N	N	N	—	9/29/16	
63	Wintergreen	Drive	Colchester0000.pdf		N	N	N	N	—	9/26/16	
75	Wintergreen	Drive	Colchester0001.pdf								
80	Wintergreen	Drive	Colchester0002.pdf								
107	Wintergreen	Drive	Colchester0003.pdf								
112	Wintergreen	Drive	Colchester0004.pdf								
119	Wintergreen	Drive	Colchester0005.pdf								
155	Wintergreen	Drive	Colchester0006.pdf								
28	Wolcott	Street	Colchester0000.pdf		N	N	N	N	—	9/27/16	
60	Wolcott	Street	Colchester0001.pdf								
62	Wolcott	Street	Colchester0002.pdf								
74	Wolcott	Street	Colchester0000.pdf								
76	Wolcott	Street	Colchester0003.pdf								
79	Wolcott	Street	Colchester0004.pdf								
81	Wolcott	Street	Colchester0000.pdf								
86	Wolcott	Street	Colchester0000.pdf								
93	Wolcott	Street	Colchester0000.pdf								
95	Wolcott	Street	Colchester0005.pdf								
9	Woodrose	Lane	Colchester0000.pdf		N	N	N	N	—	9/28/16	
12	Woodrose	Lane	Colchester0001.pdf								
30	Woodrose	Lane	Colchester0002.pdf								
39	Woodrose	Lane	Colchester0003.pdf								
54	Woodrose	Lane	Colchester0004.pdf								
73	Woodrose	Lane	Colchester0005.pdf								
76	Woodrose	Lane	Colchester0006.pdf								
92	Woodrose	Lane	Colchester0007.pdf								

Service Address		City/Town		FI Serial Number	Leak Y/N	Hazardous Y/N	Leak Y/N	Hazardous Y/N	Classification 1 ,2, or 3	Date	Clock #
101	Woodrose	Lane	Colchester0008.pdf	1501-442006	N	N	N	N	—	9/20/16	Ramier
48	Woodside	Drive	Colchester0002.pdf		N	N	N	N	—	9/22/16	
83	Woodside	Drive	Colchester0004.pdf						—		
92	Woodside	Drive	Colchester0000.pdf						—		
95	Woodside	Drive	Colchester0005.pdf						—		
44	Young	Street	Colchester0000.pdf		N	N	N	N	—	9/20/16	
47	Young	Street	Colchester0000.pdf								
69	Young	Street	Colchester0000.pdf								
78	Young	Street	Colchester0000.pdf								
87	Young	Street	Colchester0000.pdf								
102	Young	Street	Colchester0001.pdf								
107	Young	Street	Colchester0002.pdf								
119	Young	Street	Colchester0000.pdf								
130	Young	Street	Colchester0004.pdf								
165	Young	Street	Colchester0005.pdf								
173	Young	Street	Colchester0000.pdf								
187	Young	Street	Colchester0000.pdf								
214	Young	Street	Colchester0006.pdf								
243	Young	Street	Colchester0007.pdf								
244	Young	Street	Colchester0008.pdf								
261	Young	Street	Colchester0000.pdf								

Vermont Gas

MEMORANDUM

TO: ANGP File

FROM: Shana Kane

DATE: April 6, 2017

RE: Addison Natural Gas Project (ANGP) QA/QC Executive Summary (Twenty-two mile Section)

This QA/QC Summary covers the approximately twenty-two mile section of pipe from the north side of Geprags Park in Hinesburg to the Middlebury Gate Station , stations 979+00 to 2179+88.

VGS' quality assurance/quality control (QA/QC) for the ANGP project has undergone continuous improvement over the course of the project. VGS' inspectors have collected extensive QA/QC data including:

- Final holiday surveys
- Coating repairs (type and location)
- Adhesion testing
- Voltage readings
- Bending (locations, joint #, length, total deflection, any damage)
- Daily grade and ditching reports
- HDD and RD bores (locations, pull back dates, station locations, length)
- Pipe anomaly evaluation
- Pipe lowering, padding and backfill
- Cleanup and restoration

The data has been collated and analyzed for trends by the VGS Operations team and DPS regulators on an ongoing basis. VGS used this information to identify additional quality assurance checks as well as revisions needed to project specifications. Summaries of specific QA/QC focus areas for the pipeline south of Geprags Park are provided below, followed by a separate summary for the Geprags HDD pipeline installation, which occurred at a later date.

Coating

Coating integrity is a critical component of a pipeline system and has been a focus area of the ANGP QA/QC program. Specific items related to coating are summarized below.

Holiday Detection

Holiday detection was performed as pipe sections are welded together to identify any anomalies needing repair. Final holiday detection surveys were performed prior to the pipe being laid in the trench and as it was lowered into the ditch.

VGS plans a closed interval survey and coating holiday survey of the buried 22-mile segment in 2017.

Adhesion Testing

The lead coating inspector performed adhesion tests for the Canusa sleeves and epoxy coating, used on the Pritec-coated pipe and fusion-bonded epoxy (FBE)-coated pipe respectively. This quality control process tested the integrity of applied coating and was a key factor that identified an issue with defective Canusa wrap (see discussion below).

Canusa Wrap Failure

In 2016, adhesion testing identified failure of coating repairs that used Canusa sleeves from a set of 2013 and 2014 manufactured lots. Immediate actions included removal of the Canusa lot numbers from the project and identification of locations that had sleeves installed from these lots. Testing was performed on other lots of Canusa wrap; no additional batches were identified as having quality issues. See attachment, “Report on Canusa Shrink Sleeve Peel Tests”.

Handling Damage

The Pritec coating used for the ANGP project has been susceptible to damage during pipe handling (transfer of pipe and bending). Project personnel had operator qualifications related to coating damage prevention, field bending of pipe and hauling, stringing and handling of pipe. Coating inspectors were onsite and provided field oversight of pipe handling techniques. QA checklists were completed for coating application, repairs and holiday inspections.

Bending of the pipe was performed in accordance with specifications outlined in Trenching and Backfilling (Section 312333). Inspectors performed QA/QC of the bending to ensure coating was not damaged during the bending process. It was observed that bends with a high total deflection were more likely to have coating damage. Any damage as well as high deflection bends was repaired with Canusa sleeves.

Horizontal Directional Drilling (HDD)

This pipeline segment had eleven sections of pipe installed by HDD. Michels followed VGS requirements for HDD pipe pullback and HMM completed QAQC checklists for each location.

The HDD at Monkton Swamp required approximately 158 ft. of pipe to be pulled through prior to the pipe meeting inspection criteria. VGS provided details related to the acceptance of this HDD to the Department of Public Safety on Sept. 6, 2016.

Welding

Welding was performed in accordance with project specification Section 137000 – Welding, which includes 100% visual inspection by HMM inspectors and 100% radiographical inspection.

No QAQC issues have been identified for follow-up.

Materials – Pipe Anomalies

Pipe anomalies/defects were detected at the ends of several joints of pipe. Prior to June 20, 2016, inspectors performed visual inspections of the anomalies for acceptance or mitigation.

VGS issued Directive 2016-004 on June 20, 2016 which established a procedure to measure anomalies with pit gauges or ultrasonic testing (UT) and detailed criteria for acceptance, repair or cut-out.

Anomalies were repaired by grinding or cut out, depending on the pit depth and wall thickness. UT was used to ensure pipe thickness met requirements in areas of repair by grinding.

VGS plans a closed interval survey of the buried 22-mile segment in 2017, which will assess coating integrity and an ILI survey, which will assess wall thickness. In addition, the cathodic protection system will be commissioned as soon as possible after the pipeline is fully installed.

QAQC ADDENDUM – GEPRAGS HDD

Coating

The pipe installed for the Geprags HDD has fusion-bonded epoxy (FBE) coated to the steel and Powercrete abrasive resistant overlay (ARO) coating. In addition, the welds had a sacrificial coating of Canusa Wrapid Shield fiberglass cloth for protection against possible damage during pullback.

Holiday Detection

Holiday detection (jeeping) was performed by VGS personnel. Each weld joint was jeeped after the R-95 two-part epoxy was applied and prior to the installation of the Wrapid Shield. A final survey performed as the pipe was being pulled in. No holidays were detected during either survey.

Adhesion Testing

VGS performed three adhesion tests for the R-95 epoxy coating; all were successful.

Horizontal Directional Drilling (HDD)

The HDD at Geprags Park was drilled and installed by Gabe's Construction Company following VGS requirements. Pullback met VGS' HDD acceptance criteria.

Welding

Welding was performed by Mulholland Welding in accordance with project specification Section 137000 – Welding. No cut-outs or repairs were required.

Team Industrial Services performed radiographical inspection of all welds. No issues were detected.

Report on Canusa Shrink Sleeve Peel Tests

Date: March 21, 2017, Revision 0

By: Christopher LeForce

Purpose: This report summarizes and addresses the testing performed on the Canusa Shrink Sleeves, specifically the batches from 2013 and 2014.

Background: As part of the Addison Natural Gas Project (ANGP), adhesion tests were performed on the various field applied coatings. For the Canusa K60 Shrink Sleeves, the adhesion test performed was a field peel test. The VGS Construction Team and contractors followed the Canusa procedure titled "Field Peel Test & Repair Procedure."

The adhesion test for the Canusa K60 shrink sleeve consists of cutting a 1-inch wide by 6-inch long outline into a sleeve 24 hours after it was applied, then using a utility knife to pry back the first two inches of the cut sleeve. Vice grips with an attached force gauge are attached to the 2-inch tab and used to pull the coating at a 90° angle at a rate of 4 inches per minute. The tab is pulled until cohesive failure is noted to both substrate and sleeve backing.

On August 19, 2016, a field adhesion test was initiated but failed when attempting to pry back the 2-inch tab of the coating. The sleeve backing (yellow outer layer) separated from the adhesive, which was bonded to the steel. The lot number associated with this adhesion test was 13-B-319. The "13" refers to the year it was manufactured. Eight additional adhesion tests were performed that same day; six failures occurred and were associated to 2013 lots. Two other lots were tested and passed.

The VGS lead coating inspector contacted the manufacturer, Canusa, and the distributor, Liberty Coatings, regarding the field peel test failures associated with lot 13-B-319. On August 22, 2016, representatives from both companies were on-site to witness additional field peel tests. Two adhesion tests were performed (lot 13-B-319 and 14-B-284) and received a fail rating. All parties agreed that the adhesion tests were performed according to the Field Peel Test & Repair Procedure and failed due to adhesive failure from the backing.

The Canusa representative then conducted additional tests on sleeves with batch prefix 14-B. These tests also received a fail rating due to adhesive failure from the backing. During an August 22, 2016 meeting between Canusa representative (Jeff Bertsche), Liberty Coating representatives (Shane Quakenbush and Wally Armstrong), Michels QA/QC (George Hess), and VGS lead coating inspector (Ryan Schaefer), all parties agreed that Canusa batches associated with years 2013 and 2014 should not be used until Canusa could perform laboratory tests on the batches of concern.

Actions: All welds coated with a shrink sleeve batch from 2013 or 2014 and had not been buried, were removed and replaced with a newer batch from 2015 or later. A total of 296 shrink sleeves were removed and replaced. Currently 66 shrink sleeves remain from 2013/14 batches that were installed during the 2016 construction season.

Canusa took shrink sleeves from 2013/14 batches and ran laboratory tests on them. They conducted both a Peel Test and a Lap Shear Test. The results of those tests and discussion around them is included in a document titled "Re: Canusa Peel Test / Lap Shear Review for the Vermont Gas / Michels Project" to Mr. Wally Armstrong from Mr. Paul Boczkowski on January 24, 2017.

Discussion: The Field Peel Test was used as a QA/QC check on the application of the field applied coating. The purpose of the test is to make the shrink sleeve fail. The type of failure is the important part of the test. As described in the Canusa document referenced above, there are three types of failure modes described as follows:

- Cohesive Failure – adhesive remains on both the steel substrate and PE backing
- Adhesive Failure from the Backing – all adhesive remains on the steel substrate
- Adhesive Failure from the Substrate – clean peel, no adhesive on the steel substrate

The first two are acceptable failure modes and the last one is unacceptable. Basically, the adhesive on the shrink sleeve is the corrosion protection and the outer backing layer is protection for the adhesive. The worst outcome is to have the adhesive not adhere to the steel pipe it is protecting, which is adhesive failure from the substrate.

The Peel Tests that were completed on ANGP primarily experienced cohesive failure. The Peels Tests that were completed on August 19, 2016 and August 22, 2016 experienced adhesion failure from the backing. Both were acceptable failure modes.

Canusa conducted their own laboratory tests on the shrink sleeves from 2013/2014 batches as outlined in the Canusa document referenced above. The Peel Test showed that varying the temperature can effect the failure mode between cohesive failure and adhesion failure from the backing. They did not have any test experience adhesion failure from the substrate, which would be the unacceptable result.

Further testing, specifically a Lap Shear Test, was completed on the shrink sleeves from 2013/2014 batches to closely mimic the conditions of a buried pipeline where soil stresses act on the pipe and its coating. The results of these tests show that the sleeves were compliant with Canusa's performance standards.

Conclusion: With the results of the tests completed by Canusa, VGS believes no further action needs to be completed at this time. The lab test results show that the Canusa K60 Shrink Sleeves from batches manufactured in 2013 and 2014 were acceptable and the results of the Field Peel Tests on ANGP that were experienced were also acceptable.

VGS will maintain records of the installed shrink sleeves in the event a future problem develops.

January 24, 2017

Mr. Wally Armstrong
Liberty Sales & Distribution
2880 Bergey Road, Suite F
Hatfield, PA 19440

Re: Canusa Peel Test / Lap Shear Review for the Vermont Gas / Michels Project

Dear Mr. Armstrong

With respect to the above referenced Review, please be advised that Canusa has performed testing on 2013/14 manufactured K-60 heat shrink sleeves (“Sleeves”), which were supplied to Michels in August 2016, for installation on the subject Vermont Gas Addison Country Project. The results of the testing are set out here below, alongside the test methods of both Peel Tests and Lap Shear Tests used to evaluate the Sleeves.

Field Peel Test

It should be noted that the references to “failure” used throughout this document refer to a pipeline industry term used to describe how adhesives separate from the different layers. Failure is the desired outcome of the testing, the particular mode of failure being the desirable or undesirable test result.

The Field Peel Test is a quality control check, which may be used on the Right-of-way (“ROW”) as a method of determining whether the heat shrink sleeve was applied properly. Visual inspection is used additionally or in the alternative. The Field Peel Test utilizes portions of the ASTM D1000 and the DIN 30672 standards as performed in a lab, however lab testing procedures naturally use more precise instrumentation providing accurate values and temperatures, which are held constant throughout the testing process. The Field Peel Test is used to measure the bond of the adhesive to the substrate.

Changing temperatures on the ROW can produce different peel values and peel modes, and therefore the peel tests completed in the field are not considered to be a reliable measure or an indicator of the product’s in-use performance, rather as stated they are used to check for proper surface preparation and preheat.

Installers typically use visual inspection of the peeled area to determine the particular failure mode and to understand if the Sleeve has been applied properly. The three (3) typical modes of failure are as follows:

- Cohesive Failure – adhesive remains on both the steel substrate and PE backing
- Adhesive Failure from the Backing – all adhesive remains on the steel substrate
- Adhesive Failure from the Substrate – clean peel, no adhesive on the steel substrate

Field Peel Tests can result in cohesive failure, however, adhesive failure from the backing can also occur with cooler ambient temperatures as was the case on this project. Adhesive failure from the substrate (bare pipe exposed), would be considered an undesirable and an unacceptable result, which would typically require the joint to be recoated. It is important to note that in the case of this project, this ‘adhesive failure from the substrate’ failure mode did not occur.

Peel Test

Canusa conducted peel tests for the purpose of simulating the Vermont Gas / Michels field peel test as set out below. The results of the testing show that temperature differences between the adhesive and backing can change the resultant failure mode, for example, a temperature differential of 5.3°F can produce the adhesive failure from the backing failure mode as opposed to the cohesive failure mode. Both failure modes being considered acceptable modes of failure for this test.

Figure 1: Canusa K-60/L, QA# 13-B-319 SL

Peel Test Method:

- 2016 Canusa K-60/L sleeve was applied
- Ice was placed in the bottom half of the pipe to simulate a temperature differential between the steel surface and the outer PE backing.
- Peel test was performed.

The results of the Peel Test were as follows:

- Top half of the pipe, test showed cohesive failure = a PASS
- Bottom half of the pipe, test showed adhesive failure from the backing = a PASS
- Same Sleeve, installer and peel test with two (2) different results. The only variable that changed was a lower steel pipe temperature. (Approximately 5°F).

Figure 2: Follow Up Testing Canusa K-60/L, QA# 16-B-554.

The testing and results obtained described above indicate that the Sleeve's performance was normal, acceptable and the peel testing in the field was conducted at a peel failure mode transition temperature (temperature differential). Both results would be considered a PASS.

The existence of two results may have contributed to some confusion on the ROW, since we understand the contractor had observed only one (the cohesive failure mode) thus far. In a proactive response to the concerns expressed on the ROW all 2013 and 2014 material was set aside and replaced with 2016 material until Canusa could show there were no material quality issues. We understand that Michels wanted to ensure that this 2013 and 2014 material would perform as expected.

Canusa reviewed the quality control reports at the time of manufacturing of the Sleeves and has also completed lap shear testing (to ASTM D1002). All manufacturing quality control test results (thickness, viscosity, softening point, shear, peel, etc.) were shown to be within acceptable ranges. The lap shear testing performed is discussed below.

<u>Lap Shear Testing</u>

The lap shear test follows ASTM D1002. This test is used to ensure that the Sleeve can withstand soil stresses such as the longitudinal shear deformation caused by temperature differences and circumferential stresses exerted during wet/dry cycles. Lap shear measures the comparative strengths of adhesives for bonding materials.

Lap Shear Test Method:

1. 1 square inch of adhesive is placed between two metal strips (or metal and PE backing strips)
2. Condition sample for several hours at required temperature
3. Place sample between grips of Instron test system
4. Pull sample apart at specified rate
5. Typical values for the Canusa K-60 is 35 N/cm^2

The lap shear test provides a good indicator of how the sleeve will perform in service. A random sample of 2013 and 2014 sleeves were pulled from the ROW and sent to the Shawcor Technology and Development Center for testing.

The Lap Shear Test results are set out in Appendix 1 to this letter and show that all values are within acceptable ranges.

In conclusion, the Peel tests and Lap Shear tests described here, the results of which are shown for both the 2013 and 2014 Canusa K-60 heat shrink sleeves, demonstrate that the Sleeves are compliant with Canusa's performance standards and expected therefore to perform normally and within our product specifications.

Should you wish to discuss these results, have questions or require any further information, please do not hesitate to contact myself or Ms. Salehpour from Canusa's Product and Technology Management, contact information below, Thank you.

Sincerely,

Paul Boczkowski
Global Product Manager
Phone: +1-416-744-5590
Paul.Boczkowski@shawcor.com

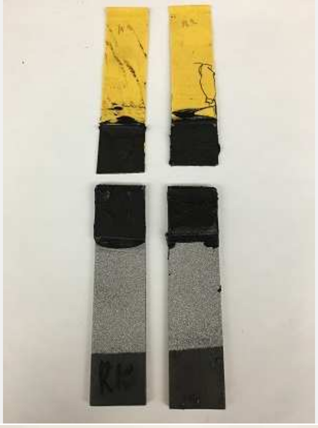
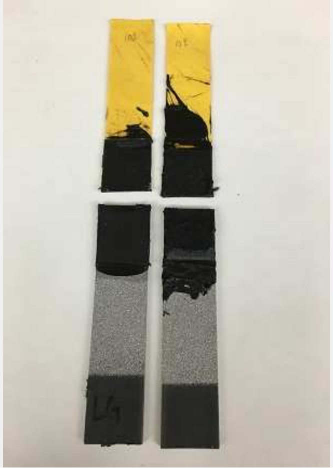
Somaieh Salehpour
Global Technology Manger
Phone: +1-416-744-5792
Samaieh.Salehpour@shawcor.com

Appendix 1

Figure A1: Results of lap shear tests on 2013 Sleeves

Lap Shear Testing for 2013 Canusa K-60 / Vermont Gas, 1cm/min, 15°C		
QA #	**Average Value**	**Image**
13 B 319 SL	45 N/cm^2 CF, backing broke	
13 B 2201 LG	49 N/cm^2, CF	
13 B 1981 SL	49 N/cm^2, CF	

Figure A2: Results of lap shear tests on 2014 Sleeves

Lap Shear Testing for 2014 Canusa K-60 / Vermont Gas, 1cm/min, 15°C		
14 B 1404 RK	44 N/ cm², CF	
14 B 108 LG	46 N/ cm², CF	

Attachment 13

MEMORANDUM

TO: Addison Natural Gas Project (ANGP) File

FROM: Christopher LeForce

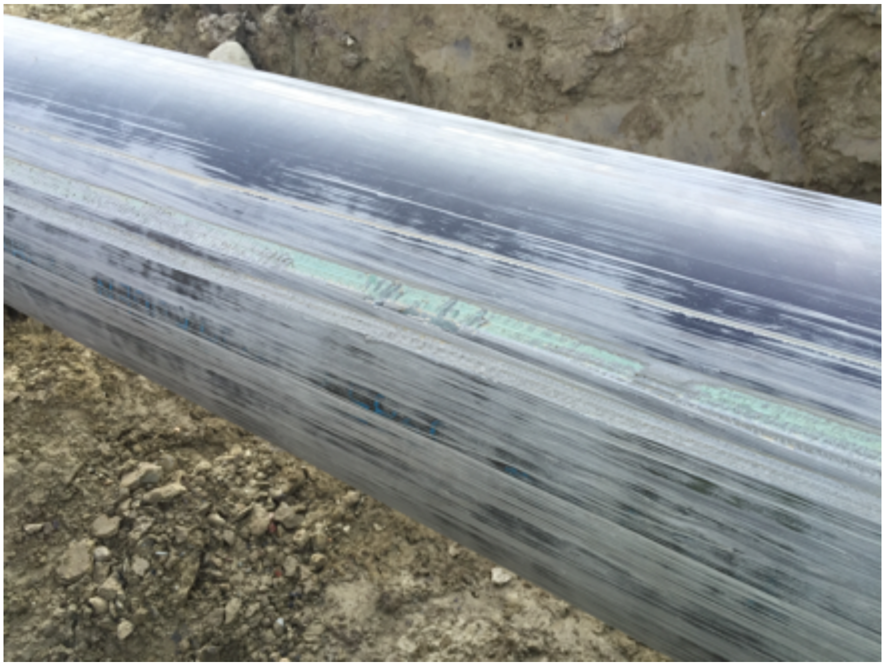
DATE: September 6, 2016

RE: Acceptance of the Monkton Swamp Horizontal Directional Drill (HDD)

Michels Pipeline Construction completed the HDD of the Monkton Swamp on August 6, 2016. During the initial inspection of the pipe and a weld, coating damage down to metal was found, along with some damage to the steel pipe. Additional pipe was pulled through the borehole to locate where the damage ended. Approximately 158 feet of additional pipe was pulled. On August 10, 2016 an approximately 16-foot section of pipe was inspected. Visual inspection of the pipe showed no damage to the steel pipe or coating damage down to bare metal. There were scratches and scrapes in the Abrasive Resistant Overlay (ARO), some down to the FBE pipe coating. This section of pipe was jeeped and did not indicate any holidays in the coating. The jeep was checked using a known anomaly on an adjacent section of pipe and did alert, indicating a holiday. The HDD was accepted. Present for the final inspection were Christopher LeForce (VGS Project Engineering Manager), Mike Reagan (ANGP Construction Manager), Darrell Crandell (ANGP Chief Inspector), Bob Spinette (Michels HDD Superintendent), Carl Bubolz (Michels Construction Superintendent), and John McCauley (Vermont State Inspector).

The acceptance criteria for an HDD was met in this instance. After finding damage to the steel pipe and coating during the initial inspection of 15 feet of consecutive pipe and a weld, additional pipe was pulled through as the plan indicates to do. The damage to the steel pipe and coating subsided as more pipe was pulled through. A new visual inspection of 15 feet of consecutive pipe was completed which indicated damage to the ARO. This same section of pipe that was inspected using a jeeping tool and no holidays were found on the section.

The "HDD Inspector's QA Checklist" for the Monkton Swamp HDD is attached for reference. Also included below are pictures of the final section of pipe inspected.



HDD Inspector's QA Checklist

QAQC Checklist (Procedure # VGS-110-2, Inspection of New Transmission Facilities)

Section: **Addison Natural Gas Project Phase I**

Date: 8/10/16

Report #:

Location: Monkton Swamp

Inspector: Mike Ray

Contractor: Michels

Super/Foreman: Bob spinalle

Weather/Temp: Cloudy /H 83 L 70

County/Town: New Haven

JSA Topic: Safety

Final Report: ☐ No ☐ Yes

WORK DETAILS/COMMENTS (use backside of page, if needed)

Monkton Swamp pull back is completed. Peyser bore 100 ft on ream pass today. Storage Shed 300 ft on 18 in ream today .Lewis Creek 180 feet to finish pull back.

The Monkton Swamp HDD pipes initial 15' and 1st weld was visually inspected and found to have coating loss down to bare steel with anomolies down to the steel pipe in some areas. The pipe continued to be pulled through until a good 15' section of pipe was observed. A total of approx. 158' was cut off due to damage of the coating. After visually inspecting a good section of pipe it was then jeeped and found acceptable for a total length of 16'1". Those in attendance were the Construction Manager Mike Reagan, Chief Inspector Darrel Crandall, VG Project Engineer Chris LaForce, Michels HDD Superintendant Bob Spinette, Michels Construction Superintendant Carl Buboltz, Vermont State inpsector John McCauley and various other Michels employees that were on site.

	Yes	**No**
Did ABNORMAL working conditions adversely affect construction progress?	☐	☐
Crews affected by adverse weather, right-of-way, or other working conditions?	☐	☐
Any Contractor caused delays, down time, or other reduced progress?	☐	☐

If Yes, explain Below (use backside of page, if needed)

Inspector's Name: Mike Ray

Signature: Mike Ray

Date: 8/10/16

Additional Comments:

Photos Below:

Vermont Gas
CLEAN ENERGY CLEAN AIR

HDD PULLBACK OPERATIONS CHECKLIST- QAQC Checklist (Procedure VGS-110-2)

A	**Contractor & Contractor Foreman**	Michels BobSpinele	**Location**	Monkton Swamp

B

WORKING CONDITIONS

Weather Conditions: Cloudy H 82 L 57

Right-of-Way Conditions: Dry

	Yes	No
A. Crews affected by adverse weather, right-of-.way or other working conditions?	☐	☑
B. Any Contractor caused delays, down time or other reduced progress?	☐	☑
C. Have all personnel onsite attended the JSA and activity plan meeting?	☑	☐

INSPECTOR'S CHECK LIST

C

Pre-pullback Items

1. Have all the contractor daily reports for pilot hole drilling and reaming operations containing drilling fluid properties, bentonite quantities, additives, torque values and any other pertinent information been submitted and reviewed? [✓ Yes] No

2. Have the pullback strings been properly pressure tested? [✓ Yes] No

3. Has the contractor/s viewed and inspected to their satisfaction the pullback strings and corrected any coating or mechanical defects or notified the company representative of any said defects? [✓ Yes] No If yes, have the defects been repaired to the satisfaction of the contractor and company? [✓ Yes] No

4. Have all permanent welds been inspected by required NDE methods? [✓ Yes] No

5. Have all notices been given to the right of way department in case pullback operations go into extended hours? [✓ Yes] No

6. Is there sufficient rated equipment on site with adequate rigging to properly hoist the drill strings to the over-bend radius as specified in the design submittal? [✓ Yes] No

7. Does the contractor have the properly rated swivel for the HDD section? [✓ Yes] No Has the swivel been properly installed between the pull string and the reamer assembly? [✓ Yes] No

8. Have rollers been inspected as to ensure no damage to the pipe string? [✓ Yes] No ☐ N/A Are the pull strings properly supported on rollers to accommodate pullback so as not to damage the pipe or coatings during pullback operations? [✓ Yes] No ☐ N/A

9. Is the drill rig being utilized for pullback the size and type as specified in the design submittal? [✓ Yes] No If not, has the literature for the drill rig to be utilized been submitted to engineering for approval and verified not to have capabilities to overstress the pull string? [✓ Yes] No

10. Are there sufficient materials and equipment onsite to mitigate potential inadvertent fluid releases, particularly in areas of previous releases during the pilot hole drilling and reaming processes? [✓ Yes] No

11. Are welding and NDE personnel onsite or at a nearby location on standby prior to commencement of activities? [✓ Yes] No

12. Have all personnel performing OQ covered tasks been identified and verified through the VGS compliance department? [✓ Yes] No

13. Is the holiday detector onsite, properly calibrated and grounded, and are personnel able to access a sufficient length of the drill string during pullback operations to perform holiday detection and associated coating repairs? [✓ Yes] No

14. Are there sufficient and proper coating kits onsite to perform coating of the tie-in girth welds and coating repairs? [✓ Yes] No

15. Are there sufficient tents or temporary shelters onsite to accommodate welding and coating activates in case of inclement weather events? [✓ Yes] No

Inspector Name: Mike Ray

Date: 8/10/16