ALTA
ARD OPERATING, LLC

February 15, 2019

Secretary's Bureau

PA Public Utility Commission

P.O. Box 3265

Harrisburg, PA 17105-3265

Re: Request for Special Permit ARD Operating, LLC

To whom it may concern:

This is a request for a waiver regarding use of unconventional pipeline material in a Class II regulated area in Cogan House Township, Lycoming County, Pennsylvania.

ARD Operating, LLC is seeking approval to install FlexSteel Technologies spoolable line pipe to be used as Class II natural gas gathering line. Enclosed is information regarding this pipe material and location of the line. All FlexSteel pipe currently being used by ARD Operating outside jurisdictional areas has been installed, and tested, as if it were steel pipeline.

Contact Information:

Edward J. Brezovec

Facilities Engineering Manager

ARD Operating, LLC

570-979-1236

ebrezovec@alta-resources.com

Respectfully,

Brett Butterworth
Facilities Specialist

Request for Special Permit to:

Board of Commisioners

Pennsylvania Public Utility Commission

Commonwealth Keystone Building

Harrisburg, PA 17105

The Applicant is:

ARD Operating, LLC

OPID# 39650

33 West Third Street, Suite 300

Williamsport, PA 17701

The designated contact for the application is:

Ed Brezovec, Facilities Engineering Manager

33 West Third Street, Suite 300

Williamsport, PA 17701

570-979-1236 Office

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1. Overview of ARD Operating, LLC (ARD)

ARD is an independent natural gas exploration and production company operating in the Marcellus Shale of Northeastern Pennsylvania. ARD currently owns and operates over 300 miles of natural gas midstream gathering pipelines, located in Lycoming, Clinton, and Centre Counties. After purchasing the asset in 2017 from Anadarko Petroleum Corporation (APC), ARD continues to expand and safely operate the infrastructure consisting of spoolable FlexSteel and carbon steel pipe installed within the last 10 years.

2. Description of Project and Facilities

ARD seeks a special permit from the Pennsylvania Public Utilities Commission (PAPUC) to authorize the use of FlexSteel Pipeline Technologies, Inc. (FlexSteel) pipe and fittings in a Class 2 regulated area. ARD proposes to install dual (2) 6-inch 1500 psig rated pipes approximately 2.4 miles (2.4 miles of right of way, actual 4.8 miles of pipe) in Cogan House Township, Lycoming County. The project would gather natural gas from an existing stranded well pad, the Michael R. Fulkerson Pad, located at 494 Cogan House Rd. in Cogan House Township. Refer to attached map (Exhibit A).

The right of way (ROW) is 60-ft wide with road crossings on State Route 184, Cemetery Rd, and Taylor Road. The land located just to the north of this project is mountainous and forested, while lands to the south consist of mainly farmed agricultural fields. The Fulkerson wells were drilled in 2012 by Anadarko

Petroleum Corp. to secure leasing agreements and have been stranded ever since. Due to their remote location from the rest of our gathering, and no current plans to further develop this area, traditional steel pipe is not economically feasible in this application.

With 72% of ARD's natural gas pipeline system built using FlexSteel and an additional 70 miles being used for our fresh water infrastructure, ARD is a leading user of FlexSteel pipe in the Appalachian Basin. ARD currently has 274 miles of this product in the ground and has had no integrity or operational concerns since first installed in 2010. FlexSteel's technology allows for narrower rights of way, 90% fewer connections per mile than traditional steel, and significantly reduced construction times, all of which combine to limit potential inconvenience caused to local land owners and residents in the affected area.

3. Affected Codes

ARD seeks a special permit addressing the following requirements and specifications of Title 49 CFR, Part 192

Section	Section Title	Discussion / Rationale
192.53	General	Sub-paragraph (c) does not recognize flexible steel pipe in meeting the requirements of the Subpart.
192.55	Steel Pipe	(a)(1) There is no listed specification for flexible steel pipe. (a)(2) Qualification requirements are specific to rigid steel pipe and do not apply to flexible steel.
192.105	Design formula for steel pipe	This section does not provide a design formula for flexible steel pipe.
192.107	Yield strength (S) for steel pipe	This section does not provide a design formula for flexible steel pipe and fittings.
192.109	Nominal wall thickness (t) for steel pipe	This section does not address the steel strip reinforcement used in flexible steel pipe.
192.111	Design factor (F) for steel pipe	This section does not provide design factors for flexible steel pipe.
192.113	Longitudinal joint factor (E) for steel pipe	This section does not apply to flexible steel pipe.
192.144	Qualifying metallic components	There is no listed specification for the swaged steel connectors to use with the FlexSteel pipe system.
192.149	Standard fittings	There is no listed specification for the FlexSteel connectors.
192.150	Passage of internal inspection devices	There is no need or value in running an ILI tool since the internal wall of the FlexSteel pipe is thermoplastic.
192.619	What is the maximum allowable operating pressure for steel or plastic pipelines	This section does not provide a design formula for flexible steel pipe.

The Title 49 CFR, Part 192 design requirements listed in Table 1 are based on Barlow's formula developed for API 5L carbon steel line pipe fabricated from a single piece of rigid material. This simple model is not appropriate for flexible steel pipe, which is a complex structure. FlexSteel uses the design methodology from API 17J and requirements to establish the manufacturer's pressure rating (MPR) from API 15S, Second Edition, March 2016. Section 4 below, details the FlexSteel design methodology which is based on API 17J. FlexSteel has conducted stress and strain analysis demonstrating that the FlexSteel pipe designs are conservative compared to API 17J requirements for applicable loads cases, even though this requirement was mandated for harsh offshore environments and is not applicable in the proposed installation.

4. Background of FlexSteel

Known by the trade name FlexSteel, this flexible steel pipe offers the strength of steel pipe with the ease of installation and corrosion resistance of polyethylene (PE) pipe. Prime Natural Resources acquired the FlexSteel business in October 2009 to further develop and expand the onshore flexible pipe business. Since that time, FlexSteel has grown both in volume of pipe manufactured as well as in product offerings. FlexSteel pipe is manufactured in Baytown, Texas.

FlexSteel is ISO 9001:2008 certified and conducts its manufacturing processes in accordance with an API Q1 written program. The FlexSteel business unit was formerly owned by Wellstream, and key management and manufacturing expertise are still associated with the business. Wellstream has manufactured pipe for the offshore oil and gas industry for more than 30 years in some of the most severe offshore environments, including:

- Water depths exceeding 6,500 feet;
- Operating pressures up to 15,000 psi; and
- Pipe with internal diameters of 2-inches to 19-inches.

Wellstream applied the experience gained offshore to develop the first flexible steel pipe for onshore oil and gas operations.

5. FlexSteel Design

5.1.1 FlexSteel Design Codes

FlexSteel is manufactured in accordance with, *inter alia*, applicable portions of the following industry standards, specifications, and codes:

- API 15S Specification for Spoolable Reinforced Plastic Line Pipe
- API 17J - Specification for Unbonded Flexible Pipe
- API RP - 17B Recommended Practice for Unbonded Flexible Pipe
- ASME IX Boiler and Pressure Vessel Code - Welding and Brazing Qualifications

- ASTM D3350 - Standard Specification for PE Pipe and Fittings Materials:
- ASTM F2805 - Standard Specification for Multilayer Thermoplastic and Flexible Steel Pipe and Connections
- CSA Z662 - Clause 13.1 Reinforced Composite Pipelines of the CSA Z662, "Oil and Gas Pipeline Systems"

API 15S defines the minimum requirements for the function, design, materials, and manufacturing of flexible pipe. FlexSteel meets or exceeds the requirements for materials, qualifications, fitting manufacturing and testing, and in-service integrity evaluations. The materials used in API 15S compliant products are trackable and traceable from raw materials suppliers to end-user delivery. Testing performed to establish pressure ratings are verified and certified by an independent third-party agency that conforms to ISO/IEC 17020 and/or ISO/IEC 17065. The joining procedures are tested in an unrestrained condition at 1.5 times the maximum pressure rating at the maximum allowable temperature. Other tests required include evaluation for cyclic fatigue, rapid decompression to evaluate for collapse, disbondment, and blistering, axial load capability, and external load performance using ASTM D2412. Products meeting the API 15S Specification must be manufactured in a facility that maintains a written quality management system in accordance with API Q1, ISO TS 29001, or ISO 9001. FlexSteel maintains an API Q1 program and has been audited by API multiple times.

Per API 15S, the maximum pressure rating (MPR) for steel reinforced products is established using preconditioned samples (bend radius and allowable temperature) and subjecting samples to burst test. For the MPR to be confirmed, the calculated 97.5 % lower prediction bound shall be greater than or equal to MPR/Fd. No single test specimen shall be below MPR/Fd.

FlexSteel meets or exceeds all of the requirements of ASTM F2805-15. The first edition of ASTM F2805 was passed in 2011 and has been revised several times.

API 17J defines the minimum requirements for the function, design, materials, and manufacturing of flexible pipe. FlexSteel pipe complies with the design methodology and design factors demonstrated over decades of service on API 17J compliant products. In addition, the carbon steel strip and the PE materials used in the fabrication of FlexSteel have been qualified to API 17J. The swaged end fittings used for FlexSteel pipe are the simpler and smaller API 15S-type end fittings rather than the large and complex API 17J-type end fittings.

Because the FlexSteel pipe is a product derived from a design for use in an offshore environment, there are some areas with deviations from the API 17J requirements. Some of these deviations result because the FlexSteel pipe is a newer variant of unbonded flexible steel pipe and the API 17 recommended practice and standards have not been updated to reflect certain characteristics of the FlexSteel pipe. The deviations are the result of the traditional use of flexible pipe to convey hydrocarbons in dynamic subsea applications that are not applicable to onshore, relatively static flowlines, gathering lines, and transmission lines.

API 15S and ASTM F2805 has been developed to reflect these differences between the onshore and offshore flexible steel reinforced pipe products.

Welding of the steel strip and end fitting connectors is performed in accordance with ASME Section IX for qualification of procedures and operators. All Welding Procedure Qualifications ("WPQ") are available for review through coordination with FlexSteel.

All welds used to manufacture fittings are done under ASME IX procedures and are 100% nondestructively tested using dye penetrant testing after manufacturing. WPQ's and Welder Qualifications associated with the manufacturing of fittings is on file and available for review through coordination with FlexSteel.

5.1.2 Flexible Steel Pipe Stress/Strain Analysis

API 17J, Section 5 requires that for a given application appropriate combined load cases be selected, the maximum applied loads be determined, and the stress and strain in each layer of the pipe be determined. The loads are verified as acceptable by comparing the resulting calculated stresses and strains to the maximum allowable utilizations specified in API 17J. For onshore applications, the loads are largely dependent upon internal pressure and evaluations are completed to ensure a safe product.

Engineering design is based on yield strength, which is most commonly defined as the tensile strength at 0.2% offset. For conservatism and better consistency with the types of steel used in flexible steel pipes, API 17J strength analysis uses structural strength that is similar to the yield strength and is typically considered to be 0.90 of the steel ultimate tensile strength (UTS). API 17J specifies the maximum allowable material utilization, essentially the reciprocal of a design factor, and maximum allowable strains for polymer layers. The maximum stress fraction is the maximum allowed ratio between the actual stress and the UTS_{eff}. FlexSteel pipe is rarely used onshore, and will not be used in this case, in a situation requiring the combined load cases typical of subsea installation and operation; thus, individual loads are considered separately.

In general, the pipes share essentially a single design, and similar design factors. Thus, a single analysis suffices to meet API 17J analysis requirements for all of the FlexSteel pipes.

Load Cases

The major operating load case is recurrent operation with internal pressure:

- API 17J revision 2, allows up to 0.67 * 0.90 = 0.603
- This load case is used to determine the pressure rating for the pipe.

For extreme or abnormal operations, the maximum tensile armor stress factor 0.85 * 0.9 = 0.765:

- For onshore fully static applications, the abnormal loads are generally the same as the recurrent operating loads indicated above. Since the load case allows 54% higher stresses than the recurrent load case, this load case is not limiting.

Hydrostatic pressure test case:

- API 17J allows a maximum tensile armor stress factor of 0.91 * 0.9 = 0.819
- The factory hydrotest pressure is performed at 1.3 * Design Pressure as required by API 17J for static flowlines.

FlexSteel considers the software used to develop Manufacturers' Pressure Rating proprietary and confidential, thus it is not included in the submittal because of Freedom of Information Act concerns. ARD and FlexSteel are happy to coordinate PAPUC's review of the documentation at its request.

5.1.3 Flexible Steel Pipe Cyclic Fatigue Analysis

The fatigue of the polymers' layers due to pressure cycling is not an issue. The inner and outer thermoplastic layers are extruded by FlexSteel using a High-Density PE (4710) pipe grade resin that is used for oil and gas gathering, transmission, and gas distribution service. The steel layers carry the structural load of the pipe and are the layer that must be evaluated to determine if there is concern for cyclic fatigue in a particular service. The following example of a Class 600 pipe that is cycled daily between the design pressure of 720 psi and 550 psi illustrates that the pipe has sufficient fatigue resistance in the intended application.

To expedite the analysis, a very conservative fatigue methodology for offshore structures per DNV-RP-C203 "Fatigue Design of Offshore Steel Structures", is utilized. S-N curve C1 is utilized for the most conservative result. To determine the number of cycles to failure, the following equation is used:

$$\log (N) = \log (a1) - m \log (\Delta\sigma)$$

Where N is the predicted number of cycles to failure, $\Delta\sigma$ is the stress range the product experiences during cycling, and (m) and (a1) are constants defined by the appropriate S-N curve. σ_{max} is the maximum stress in the steel strip and σ_{min} is the minimum stress in the steel strip during pressure cycling.

$\sigma_{max} = 0.480 * 457.33\ N/mm2 = 219.51\ N/mm^2$ at 720psi

$\sigma_{min} = 0.367 * 457.33\ N/mm2 = 167.84\ N/mm^2$ at 550 psi

$\Delta\sigma = 51.67\ N/mm^2$

Fatigue life calculation: (cycles to failure)

$$\log (N) = 12.449 - (3*\log(51.67))$$

$$N = 10^{12.449} \div (51.67)^3 = 20{,}383{,}774.93 \text{ cycles}$$

If the pipe is cycled daily between 550 psi and 720 psi, the pipe has a fatigue life of 27,923 years. A safety factor of 10 is applied according to the DNV & API 17J standards; resulting in a 2,792 year fatigue life estimate using this conservative analysis.

5.2 FlexSteel Pipe Design Characteristics

FlexSteel pipes have concentric extruded polymer and helically wrapped reinforcing steel layers, as shown in Figure 5-1.

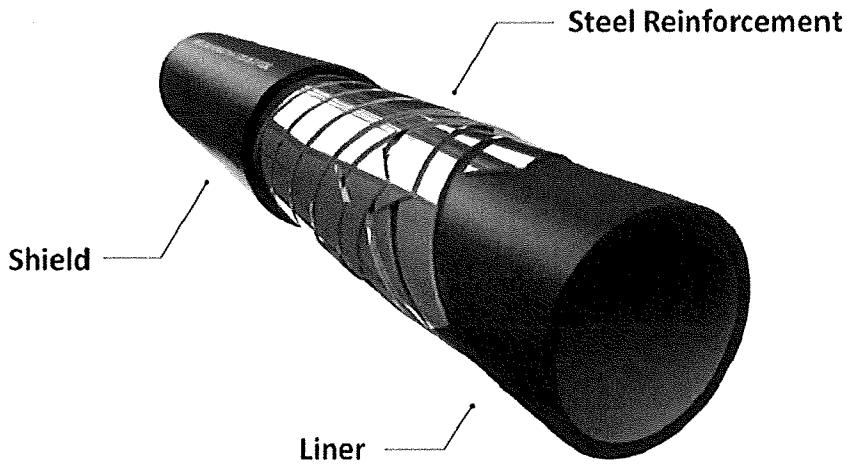


Figure 5 -1 FlexSteel Pipe Structure

The resulting structure is unbonded so that the layers are free to move during spooling and de-spooling. A detailed discussion of the functional characteristics and structures for each of the pipe layers and materials follows.

5.2.1 Liner

The innermost layer of the FlexSteel pipe is a liner or product bladder. For standard FlexSteel pipe, the liner is of pipe grade high density PE (HDPE). The resin is commonly used in the manufacture of gas distribution pipe in accordance with ASTM D2513 (HDPE 4710). FlexSteel normally uses black pigmented liners.

5.2.2 Tensile Armor

The hoop and tensile structural strength of the FlexSteel structure is provided by tensile armor layers. The tensile armor is a cold rolled and stress relieved carbon steel strip with a minimum ultimate tensile strength of 100 ksi. The tensile layers consist of contra-wound sets of steel strips applied over the liner at roughly a 55° lay angle with a nominal gap of 10%. The gap gives the pipe its flexibility and provides a continuous path to vent permeated gases. The considerations for the selection of material for the tensile layers are strength, toughness, and resistance to the permeated gases. The tensile layers are not exposed to the bore fluid; instead they are in the considerably milder annulus environment. API 17J requires that testing be performed to ensure that the steel armor is compatible with the annulus environment. ARD and FlexSteel are happy to coordinate PAPUC's review of these testing results if requested.

5.2.3 Outer Sheath

The outer sheath is an extruded external polymer barrier applied to resist mechanical damage and to provide the underlying layers of the pipe protection from the environment; i.e., an extremely thick coating. The shield is made of a pipe grade PE commonly used in the manufacture of gas distribution pipe in accordance with ASTM D2513. The standard shield material is a black PE formulated with a package of colorants, stabilizers, and antioxidants. The colorants define the pipe color and emissivity. Stabilizers minimize damage to the polymer chains from heat and UV irradiation. The antioxidants trap radicals formed when

chain scission occurs, limiting the catalytic reaction of the radicals with diffused oxygen to cause additional chain scissions.

5.3 Fittings

5.3.1 Design

The end fitting terminates the end of the pipe, maintaining the integrity of the pipe structure, sealing to the inner and outer extruded layers, and providing a fixture to transmit tension and pressure loads to the pipe structure. It interfaces between the pipe and a connector, such as a flange or weld stub. The connector mates with other steel pipe and is supplied in weld-neck or ANSI rated flange configurations. The end fitting ID after installation is typically 1/2-inch smaller than the ID of the FlexSteel pipe.

The FlexSteel pipe is terminated with simple swaged end fittings of the API 15S type, like those proven through many years of experience on hoses. The pipe and end fittings are qualified per API RP 17B and API 15S

Midline fittings are used to join one reel of pipe to another. The manufacturing and welding process is the same as for end fittings. Midline fittings incorporate an internal pathway to permit gases in the annulus to travel to the end fittings where they can be vented or captured for other purposes.

Figure 5-2 presents the basic structure of the midline and end fitting design. The end fitting body is a steel tube that fits inside the pipe bore. The jacket is a concentric steel tube that fits outside the pipe. The body and jacket are welded together and the end connector attached prior to assembly on the pipe. Although welding during the manufacturing process is not covered under the CFR, all welding performed during the fitting manufacturing process is compliant with an ASME IX Weld Procedure Specification (WPS) performed by welders qualified to each procedure. Each completed weld is non-destructively tested using liquid penetrant inspection (LPI). Fitting to pipe connections are proof tested by hydro-testing representative fitting-pipe assemblies at maximum rated temperature and at 1.5x the pipes' rated pressure with the fitting unrestrained. Acceptance criteria for hydrostatic pressure and tension qualification tests require that failure must occur within the pipe section and not the end fitting.

Figure 5-2 Midline and End Fitting Design

5.3.2 Fitting Material

The end fitting material can be supplied in either carbon steel or stainless steel, although the vast majority of fittings FlexSteel sells are the 316L variety. ARD has selected 316L stainless steel (S31603) for this application due to its superior corrosion resistance as compared to carbon steel.

6. Installation

ARD will install FlexSteel in accordance with Title 49 CFR, Part 192.327 requiring a minimum of 36" of cover. The pipe will be hydrostatically pretested by FlexSteel Technologies' manufacturing facility at 130% (1950 psi) of their published maximum allowable operating pressure of 1500 psig for a minimum of 8 hours which exceeds test pressures conducted on steel pipe which is only 60% greater than the Specified Minimum Yield Strength (SMYS) for a minimum of 5 seconds.

Pipe storage, handling, and installation techniques unique to FlexSteel products will be performed in accordance with the applicable sections of the FlexSteel Installation and Operations Manual. All fittings will be installed by FlexSteel certified technicians using FlexSteel Installation Procedures. GPS locations for all fittings will be documented on as-built drawings, as specified in these procedures.

As per FlexSteel Technologies installation guidelines after each spool of pipe is installed, the annulus between the inner liner and outer jacket of the pipe will be tested with nitrogen. Any leakage will indicate damage to the outer poly layer and through to the steel reinforcement layer and will be removed immediately and replaced. As for the installed pipeline, the pipe is initially preconditioned overnight to a minimum 1000 psig prior to commencing DOT hydrotest procedures. Following conditioning, the pipe will be tested for 8 hours at a minimum 2160 psig and maximum 2225 psig to meet a Class 3 test pressure to exceed full Class 2 compliance in accordance with Title 49 CFR, Part 192.505.

7. Operations and Maintenance

7.1 General

As with all ARD's facilities, this pipe will be designed to operate at a MAOP of 1440 psig, which is only 48% of FlexSteel's minimum burst pressure of 3,000 psig. ARD will monitor the annulus test lines provided by FlexSteel for changes in pressure indicating a potential leak point between the inner and metal layers of the pipe and will replace the affected section of line should that occur.

ARD will initially, for the first year of service perform leak surveys at 3, 6, 9, and 12 months followed by semiannual inspections for years 2 thru 5. Afterward, ARD will maintain annual regulatory inspections and surveys in accordance with Title 49 CFR Part 192. Emergency Shutdowns are located on the well pads and pressures, volumes, and alarms are monitored 24/7 from our Integrated Operations Center (IOC) which can remotely shut down well pad source pressure. In the event of a leakage, gas supply will be shut down and the pressure source will be isolated; Operating personnel will be called out to insure complete isolation of affected pipeline section. Should this pipelines integrity be found to be deficient, or should any failure occur, ARD will immediately inform the PAPUC.

7.2 Establishing the Maximum Allowable Operating Pressure (MAOP)

As discussed in 5.1.1, FlexSteel pipes are designed to have a minimum of 2:1 burst-to-design margin at worst case pipe dimensions and minimum ultimate tensile strength ("UTS") per 5.2 of API 15S. Whereas steel pipes will exceed their elastic capability at some point just slightly above 100% SMYS if the mechanical properties are approaching the low end of the tolerance range. Where the regulations permit operation of a pipeline in gas service in a Class 2 location at 60% of the point where steel could possibly fail and be within manufacturing specification tolerances, the maximum pressure in a FlexSteel product is some percentage of 50% of the pressure which will cause failure. This conservative philosophy is taken even further in qualification methodology for API 17J materials by requiring 0.67 * 0.90 = 0.603 to determine the pressure rating for the pipe with the 2:1 burst-to-design. FlexSteel's 8", 600 ANSI Flange rating product family has actual qualification testing with a minimum value of 3000 psi. Therefore the 1500 psig MPR is established at a 50% SMYS equivalent when trying to make it analogous with steel. ARD proposes to establish the MAOP for these pipelines at 1440 psig further reducing this equivalent SMYS level to approximately 48% (a stress equivalent 12% below the permissible level for a steel pipe material).

As noted in the Testing Section above, all hydro test sections will be held at a minimum of 2160 psig which meets the test requirements for a Class 3 location for the intended MAOP. All ancillary fittings (flanges, tees, and ells) used to terminate the FlexSteel to steel at each terminus will be ANSI 600 class flange rating.

7.3 Cathodic Protection

FlexSteel utilizes an extruded external polymer sheath to insulate it from the external environment. This renders cathodic protection ("CP") equipment (rectifiers, ground beds, insulation joints, test stations, anodes, *etc.*) unnecessary. The use of cathodic protection is necessary to protect steel from corroding where "holidays' in the coating exist. The traditional problem with coating is proving no holidays exist after coating inspection (jeeping) has been performed. Due to the unique design of FlexSteel, proof of coating integrity can be demonstrated and is discussed in greater detail in 6.3.2 and 6.5.1. FlexSteel pipes have electrical continuity between the tensile armor strips and the midline fittings provided by continuity clips applied during fitting installation. This continuous electrical path provided allows passage CP current through the pipe. Electrical resistance of the pipes is roughly ½Ω to 1Ω per kilometer of pipe.

For this project, ARD will install cathodic protection and will test the adequacy of the protection on the same frequency as required by 49 CFR 192.465(a)(b)(d). There is additional discussion of cp in the following "Annulus Monitoring" section below.

7.4 SCADA Monitoring of the FlexSteel Annulus

FlexSteel' s unique design not only utilizes the annulus free space between liner and outer jacket HDPE materials for flexibility and permeated gas management, but also can be used for real time pipe integrity monitoring. As discussed in the post construction testing section, the annulus is a pressure containing capable structure, but not the full MPR. The 1/8" female NPT outlets on the end fittings can be outfitted with the necessary plumbing to attach pressure transmitters, which can be incorporated into SCADA monitoring. With permeated gasses permitted to build to predetermined level (15 - 20 psig), transmitters can be configured to alarm on indications of high or low pressure outside of the established acceptable range. Continuous pressure readings within acceptable ranges provide real time indication that several key integrity features are functioning as designed. Positive pressure indicates the outer jacket material is 100% intact (holiday free) demonstrating a "perfect coating", thus external corrosion cannot occur. It indicates that the HDPE liner material is intact and containing bore fluid and pressure as intended. Any breach of

the liner would expose the outer jacket to bore pressure, which it is not designed to handle. Any loss in pressure indicated by the "real time" annulus monitoring will alert ARD that third party damage or liner failure may have occurred, allowing prompt response for further investigation. ARD proposes to use this SCADA monitoring capability monitored by the ARD Integrated Operations Center (IOC). After five years of satisfactory performance, i.e. demonstration that the outer jacket continues to be leak free, ARD will cease monitoring the cathodic protection system.

7.5 Reporting

As a pilot project, ARD proposes to provide the following data for the first 5 years of service, to the PA PUC twice each calendar year, at intervals not to exceed 7 ½ months, so the PUC can monitor the performance of the installation. This will permit the PUC to evaluate, not only the performance of this installation, but use the information obtained to assess the appropriateness for future installations. Reported information shall include:

- Number of one call tickets received resulting in a locate;
- Number of leaks and disposition;
- Number of patrols conducted;
- Results of any leak surveys conducted during the reporting period; and
- Number and voltage reading of any cathodic protection levels below acceptable criteria found during the period and corrective actions taken.

8. Regulatory

8.1 Regulatory Evaluated Projects

A special permit for the use of FlexSteel in Class 2 gas gathering previously has been approved by the Texas Railroad Commission (TRRC) and PHMSA (Docket # PHMSA-2010-0229 and PHMSA-2011-0023). With over nine years of monitoring, there have been no indications of leakage and the rate is consistently less than originally modeled by FlexSteel.

A special permit was granted by the California State Fire Marshal, with concurrence from PHMSA, in May 2018 for CA Resources Corporation (CRC) to install 1.89 miles of FlexSteel to transport crude oil through a High Consequence and Unusually Sensitive area in the Port of Long Beach.

FlexSteel underwent a similar permit/waiver process with the Alberta Energy and Utilities Board (AEUB). As a result of that process, in June of 2004, the AEUB accepted the use of FlexSteel pipe in oil and gas service. Consistent with that result, Clause 13 of the 2007 revision to Canadian Standards Association (CSA) Z662 approved the use of flexible steel pipe manufactured in accordance with the design principals of API 17J for onshore applications, including hazardous liquid and gas pipelines.

8.2 Segment Retrieval

Extensive offshore experience with flexible steel pipes and the many qualification test programs conducted over the years demonstrate the fitness for purpose of FlexSteel pipe. In Alberta, test segments were installed as part of the AEUB waiver and approval process. The test segments were typically 2 meters long and included standard end connections. Roughly 40 test segments were selected so that approximately one third

was in crude oil production, one third in gas, and one third in water injection applications. In addition, some samples for specialized applications, such as liquid CO_2 have been installed. Segment retrieval and post-service testing began in June 2006. Samples with more than 2 years of service were subjected to a battery of tests, including hydro-burst tests and materials characterization tests. To date, all retrieved test segments meet or exceed the original design specifications. Test results and test reports are available upon request. These results and reports are considered proprietary to both FlexSteel and its clients.

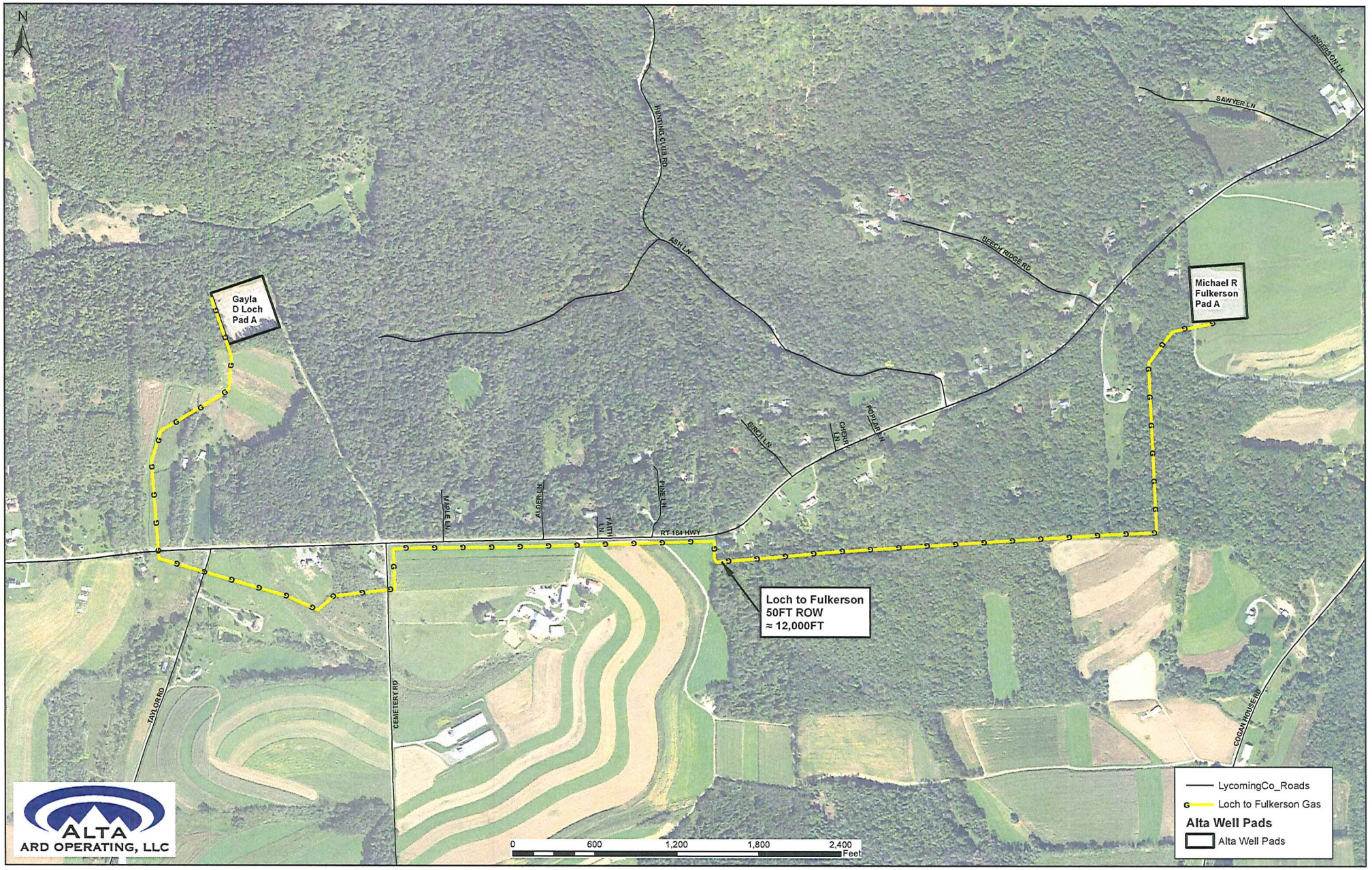
9. Conclusion

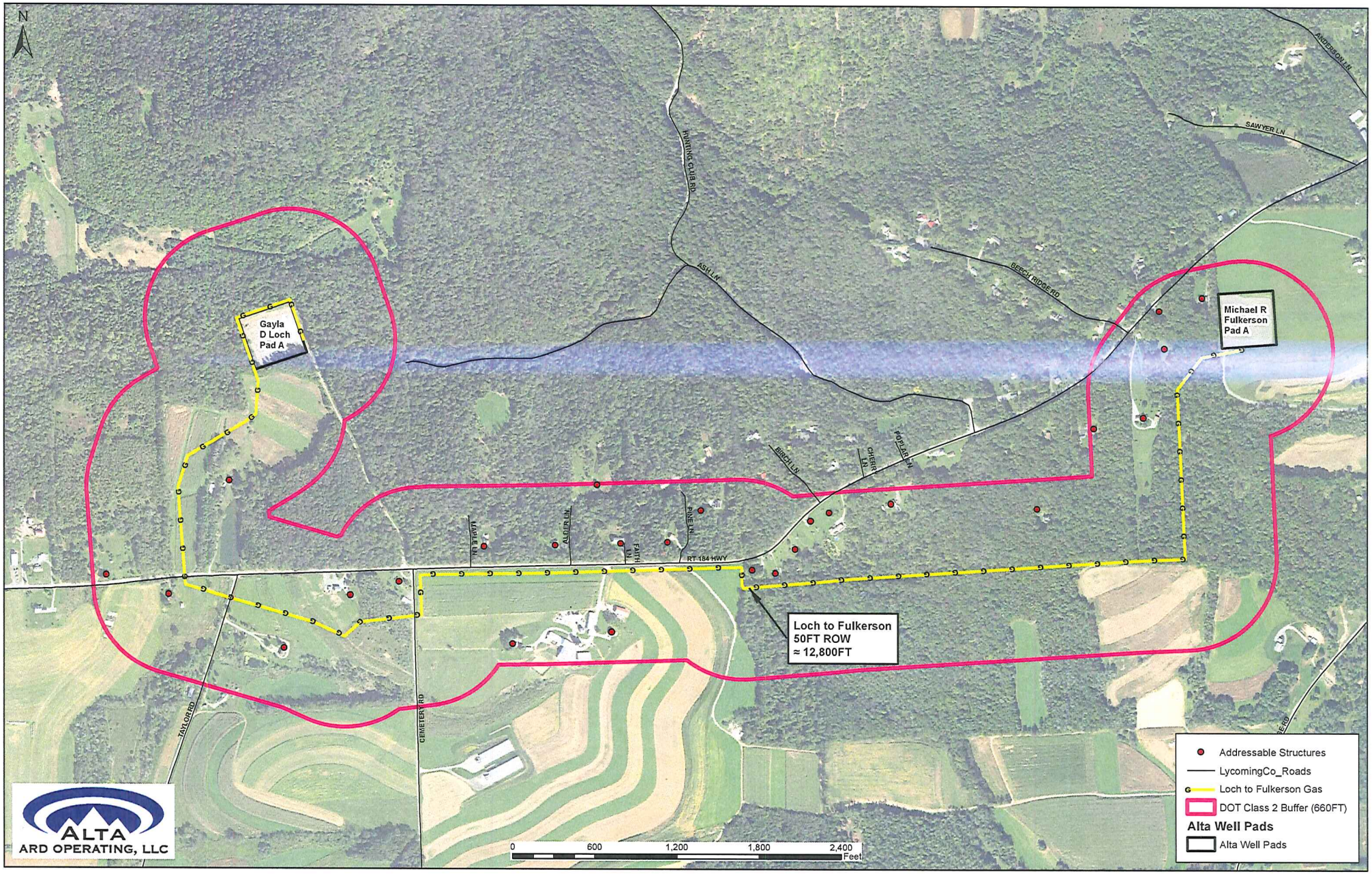
It is ARD's belief that FlexSteel pipeline is a proven, safe, reliable alternative to conventional steel pipe. In addition to having passed rigorous testing standards, this composite-type pipeline material has been safely installed and utilized in our high-pressure natural gas pipeline systems since 2010 without incident. ARD has experienced an exceptional safety record with its employees and communities in which it operates. Because of this, Flexsteel is a product we are comfortable utilizing for regulated Class 2 areas of its gathering pipeline system.

Please feel free to contact ARD or FlexSteel with any questions or requests. Recommended contacts: Jared Rall with questions regarding the specific project design and construction (jrall@alta-resources.com 570-979-1266). For questions or information regarding FlexSteel products, please contact Andy Ethridge (andy.ethridge@flexsteelpipe.com, 832-531-8527) and for specific details regarding this waiver request, please contact Ed Brezovec (ebrezovec@alta-resources.com 570-979-1236).

Exhibit A

Map of Proposed Pipeline Route


N
Gayla D Loch Pad A
Michael R Fulkerson Pad A
Loch to Fulkerson 50FT ROW ≈ 12,000FT
HUNTING CLUB RD
ASH LN
BEECH RIDGE RD
SAWYER LN
ANDERSON LN
BIRCH LN
CHERRY LN
POPLAR LN
MAPLE LN
ALDER LN
FAITH LN
PINE LN
RT 184 HWY
TAYLOR RD
CEMETERY RD
COGAN HOUSE RD
ALTA
ARD OPERATING, LLC
0 600 1,200 1,800 2,400
Feet
LycomingCo_Roads
Loch to Fulkerson Gas
Alta Well Pads
Alta Well Pads


N
Gayla D Loch Pad A
Michael R Fulkerson Pad A
Loch to Fulkerson 50FT ROW ≈ 12,800FT
HUNTING CLUB RD
ASH LN
BEECH RIDGE RD
SAWYER LN
ANDERSON LN
BIRCH LN
CHERRY LN
POPLER LN
MAPLE LN
ALDER LN
FAITH LN
PINE LN
RT 184 HWY
TAYLOR RD
CEMETERY RD
ALTA
ARD OPERATING, LLC
0
600
1,200
1,800
2,400
Feet
Addressable Structures
LycomingCo_Roads
Loch to Fulkerson Gas
DOT Class 2 Buffer (660FT)
Alta Well Pads
Alta Well Pads