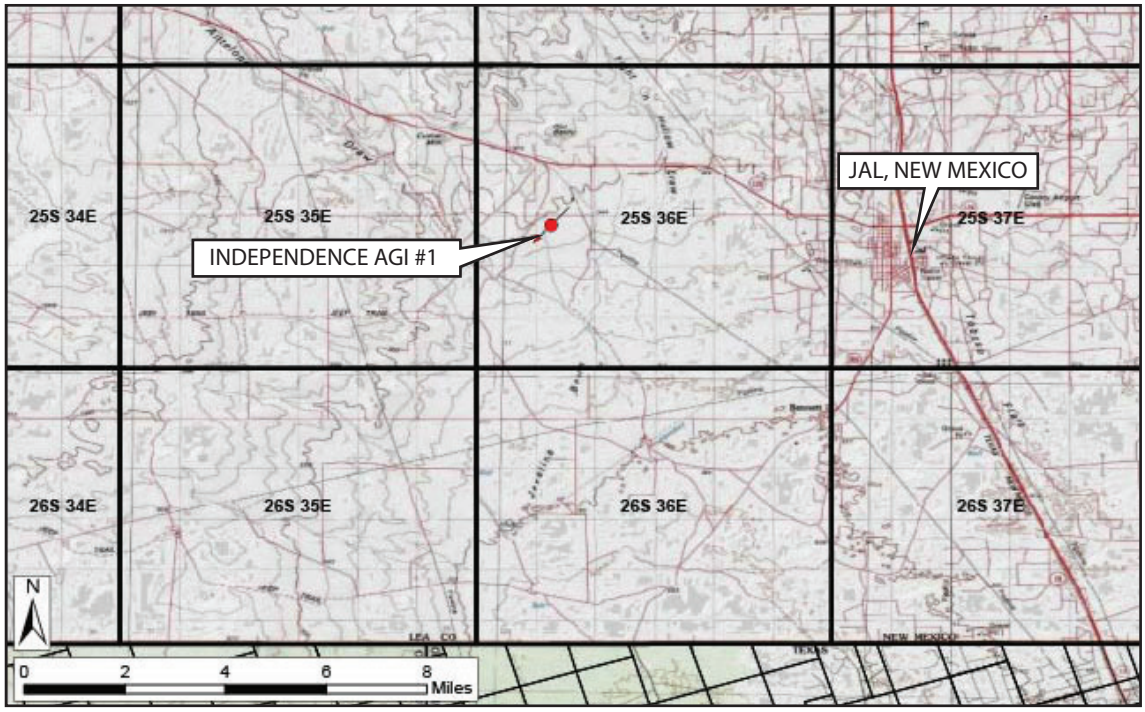
APPLICATION FOR CLASS II AGI WELL
AMEREDEV II, LLC

INDEPENDENCE AGI #1

Surface Location: 829' FNL & 1,443' FWL, Section 20, T25S, R36E
Lea County, New Mexico

Latitude (NAD83): 32.120855
Longitude (NAD83): -103.291021



July 10, 2020

Prepared for:

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Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL
RESOURCES DEPARTMENT

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

FORM C-108
Revised June 10, 2003

APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: ____ Secondary Recovery ____ Pressure Maintenance _X_ Disposal ____ Storage
Application qualifies for administrative approval? ____ Yes _X_ No

II. OPERATOR: AMEREDEV II, LLC

ADDRESS: 2901 VIA FORTUNA, SUITE 600 AUSTIN, TEXAS 78746

CONTACT PARTY: ERIC RHODEN PHONE: (737) 300-4700

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? ____ Yes _X_ No
If yes, give the Division order number authorizing the project: ____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review. **SECTIONS 5 & 6; APPENDICES A & B**

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail. **SECTIONS 5; APPENDIX A**

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected; **SECTIONS 1, 2, & 3**
2. Whether the system is open or closed; **SECTIONS 1, 2, 4, & 7**
3. Proposed average and maximum injection pressure; **SECTIONS 1 & 3**
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and, **SECTIONS 3 & 4**
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.). **SECTIONS 3 & 4**

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval. **SECTIONS 3 & 4**

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted). **WELL NOT YET DRILLED**

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken. **SECTION 4.5**

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water. **SECTION 7.0**

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: ALBERTO A. GUTIÉRREZ TITLE: PRESIDENT - GEOLEX, INC. CONSULTANT TO AMEREDEV

SIGNATURE: DATE: JULY 10, 2020

E-MAIL ADDRESS: AAG@GEOLEX.COM

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: ____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Side 2

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES AND ASSOCIATED FIGURES AND TABLES

1.0 EXECUTIVE SUMMARY

On behalf of Ameredev II, LLC (Ameredev), Geolex, Inc.® (Geolex) has prepared and is hereby submitting a complete C-108 application for approval to drill, complete, and operate an acid gas (CO_2 and H_2S) injection well in Section 20, Township 25 South, Range 36 East (32.120855, -103.291021 NAD83), approximately six miles west of Jal in Lea County, New Mexico (Figure 1).

The proposed Independence AGI #1 is designed to address the disposal needs of the future Ameredev Gas Processing Plant, which needs to safely inject up to a maximum of twelve (12) million standard cubic feet (MMSCF) per day (approximately 4,436 barrels per day) of treated acid gas (TAG) for at least 30 years. The TAG stream is anticipated to consist of approximately 70% carbon dioxide (CO_2) and 30% hydrogen sulfide (H_2S) with trace components of hydrocarbons ($C_1 – C_7$). When operating at full capacity, Independence AGI #1 will permanently sequester approximately 515 tons of CO_2 and approximately 171 tons of H_2S per day.

Independence AGI #1 will be drilled as a vertical well with a surface location of approximately 829 feet from the north line (FNL) and 1,443 feet from the west line (FWL) of Section 20 (Figure 2). The well will be constructed utilizing a four-string design and all casing strings will be cemented to the surface. The integrity of cementing operations will be verified by way of visual inspection, as well as collection of cement bond logs for all casing strings. The production casing and injection tubing will utilize approximately 300 feet of corrosion-resistant alloy casing in order to protect the well and lower well components from potentially corrosive conditions.

The proposed open-hole injection zone will target the Devonian Thirty-One and Upper Silurian Wristen and Fusselman formations, as well as the upper Ordovician Montoya Formation at depths of approximately 16,230 feet to 17,900 feet. Analysis of these geologic units confirms that they act as excellent closed-system reservoirs that will accommodate the future needs of Ameredev for the disposal of acid gas and sequestration of CO_2 from the proposed gas-processing facility.

In the area of Independence AGI #1, the proposed injection interval is overlain by a thick interval of dense Woodford Shale (approximately 316 feet) and an additional 973 feet of low-porosity, low-permeability Mississippian carbonates of the Osage and Barnett formations. These units, in total, will provide at least 1,289 feet of excellent caprock that will contain and prevent the upward migration of injected TAG. Additionally, low-porosity intervals of the lower Montoya Formation underlying the targeted injection zone will prevent the downward migration of TAG and protect underlying strata.

The requested maximum allowable operating pressure (MAOP) for Independence AGI #1 is approximately 4,779 psig, which was determined utilizing calculation methods approved by NMOCD which are based on the final specific gravity of the injection stream. At the anticipated average reservoir conditions of 200 °F and 8,389 psi, each MMSCF of TAG will occupy a volume of approximately 24,908 cubic feet (4,436 barrels). The average specific gravity of injectate is calculated to be approximately 0.82.

Injection simulations were completed to evaluate the impact operation of the proposed Independence AGI #1 would have on the target Siluro-Devonian reservoir over the life of the AGI well. These simulations were completed in collaboration with MHA utilizing Schlumberger Petrel and Eclipse platforms to construct a geologic simulation grid and simulate acid gas injection, respectively. After 30 years of operation at the maximum anticipated injection rate of 12 MMSCF per day, the resultant acid gas plume is predicted to extend a maximum of 1.8 miles from the AGI wellbore when including all non-zero concentrations. Gas-saturation levels of 20% and 10% are predicted to extend a maximum of 1.26 miles

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

and 1.5 miles from the AGI wellbore, respectively. The maximum potential saturation level observed in all cases is 50% limited to the immediate area of the AGI wellbore.

In total, there are six wells within the one-mile radius of the proposed Independence AGI #1. Specific well data are summarized in Appendix A along with relevant plugging documents. Of these wells, one is active and four are plugged. Additionally, there is one location permitted, but has not yet been drilled or completed. Within one mile of the proposed AGI, the injection zone is penetrated by one active disposal well (West Jal B Deep #1; API #30-025-25046) permitted to inject across an interval of Strawn through Fusselman formations and one plugged well (West Jal Unit #1; API #30-025-21172). West Jal Unit #1 is fully cemented through the injection zone and its location and current condition is such that it will not be negatively affected by the proposed injection scenario and operation of the proposed Independence AGI #1.

The area surrounding the proposed injection site is arid and there are no natural bodies of water within several miles of the plant. A review of the New Mexico Office of the State Engineer's files shows a total of 13 points of diversion within two miles of the proposed AGI. Within one mile of the proposed AGI, there are two water wells, the closest of which is located approximately 0.33 miles away and has a total depth of 505 feet. All wells within a one-mile radius are shallow and will be protected via the proposed Independence AGI #1 casing and cementing design, which includes a surface casing interval extending to 1,400 feet that will isolate and protect shallow groundwater resources.

In preparing this C-108 application, Geolex conducted a detailed examination of all the elements required to be evaluated in order to prepare and obtain approval for this application for injection. These elements include:

- Identification and characterization of all hydrocarbon-producing zones of wells that surround and are present on the plant site
- The depths of perforated pay intervals in those wells relative to the depth of the target injection zone (Devonian, Wristen, Fusselman, and Montoya formations)
- The past and current uses of the proposed intervals
- The stratigraphic and structural setting of the targeted zones relative to any nearby active or plugged wells, and other wells penetrating the interval
- The identification of all surface owners, lessees, and other interested parties within a one-mile radius of the proposed injection well and a sample notification letter with which they will be provided
- Identification and characterization of all plugged and operating wells penetrating the proposed injection zone within a one-mile radius of the proposed injection well
- The details of the proposed injection operation, including general well design and average maximum daily rates of injection and injection pressures
- Reservoir injection simulations to evaluate the resultant effects of injection operations in the area and predict the resultant acid gas dispersion plume

- An analysis evaluating the potential for induced-seismic events in response to the proposed injection scenario that includes detailed seismic review and mapping in the area of the proposed well

- Sources of injection fluid and compatibility with the formation fluid of the injection zone

- Location and identification of any freshwater-bearing zones in the area; the depth and quality of available groundwater in the vicinity of the proposed well, including a determination that there are no structures which could possibly communication the disposal zone with any known sources of drinking water

Based upon this detailed evaluation, Ameredev has determined that the proposed AGI well is a safe and environmentally-sound project for the disposal of treated acid gas. Furthermore, our analyses demonstrate that the proposed injection well will not negatively affect water resources, nor have any actual or potential impacts on production in the area. This application is fully protective of correlative rights.

2.0 INTRODUCTION AND ORGANIZATION OF C-108 APPLICATION

The completed New Mexico Oil Conservation Division (NMOCD) Form C-108 is included before the Table of Contents of this document and references appropriate sections where data required to be submitted are included.

This application organizes and details all the information required by NMOCD and NMOCC to evaluate and approve the submitted Form C-108 – Application for Authorization to Inject. This information is presented in the following categories:

- A detailed description of the location, construction, and operation of the proposed injection well (Section 3.0)
- An overview of acid gas characteristics and modeling simulation results to predict the resultant acid gas plume and resultant reservoir pressure effects resulting from injection operations in the area of the proposed AGI (Section 3.0)
- A summary of the regional and local geology, hydrogeology, and the location of drinking water wells within the area of review (Section 4.0)
- An evaluation of the potential for induced-seismic events in response to proposed and ongoing injection operations in the area of the proposed AGI (Section 4.0)
- The identification, location, status, production zones, and other relevant information on oil and gas wells within the area of review (Section 5.0)
- The identification and required notification for operators and surface landowners that are located within the area of review (Section 6.0)
- An affirmative statement, based on the analysis of geological conditions at the site, that there are no hydraulic connections between the proposed injection zone and any known sources of drinking water (Section 7.0)

In addition, this application includes the following supporting information:

- **Appendix A**: Data tables and maps showing all active, temporarily abandoned, abandoned and plugged oil and gas wells included within a two-mile radius and the one-mile area of review and associated plugging documents for wells within one mile
- **Appendix B**: Tables and maps summarizing the operators, lessees, and surface owners in the one-mile radius area of review, an example of the notification letter that will be sent out to these parties at least 20 days prior to the NMOCC hearing, and a draft public notice
- **Appendix C**: Preliminary drilling-fluid program generated by Artesia Lumber Co./Buckeye, Inc. for the proposed Independence AGI #1 well

3.0 PROPOSED CONSTRUCTION AND OPERATION OF INDEPENDENCE AGI #1

The Independence AGI #1 will be drilled at approximately 829 feet from the north line (FNL) and 1,443 feet from the west line (FWL) of Section 20 (Figure 2). TAG to be injected will be routed from the Ameredev gas-processing plant to on-site compression facilities that will compress and dehydrate the acid gas. The compressed TAG will then be routed to the wellhead via high-pressure, NACE-rated pipeline for injection. Design details are provided in the following sections 3.1 and 3.2.

3.1 DESIGN OF INDEPENDENCE AGI #1

The location of the proposed AGI well, and extent of Ameredev surface lands where plant facility will be constructed, are shown in Figure 2, and a general schematic of the injection system is shown in Figure 3. The Independence AGI #1 will be drilled as a vertical well to an anticipated total depth of 17,900 feet within the upper Montoya Formation. The injection zone (approximately 16,230 to 17,900 feet) will be completed as an open-hole interval that includes the Devonian Thirty-one, upper Silurian Wristen and Fusselman, and Ordovician upper Montoya formations.

The AGI facilities and well will be integrated components of the Ameredev gas-processing facility design. The proposed well schematic for the new injection well, Independence AGI #1, is illustrated in Figure 4 and is designed to accommodate the injection of up to 12 MMSCF per day of TAG for a design life of 30 years.

Independence AGI #1 will utilize a four-string casing design (Figure 4). Surface casing (20-inch) will be set in competent strata above the Salado Salt at approximately 1,400 feet. The first intermediate casing (13.625-inch) will be set through the salt to approximately 7,150 feet within the Delaware Mountain Group (Brushy Canyon Formation). The second intermediate 9.625-inch casing will be advanced to approximately 13,200 feet, protecting active and planned production in the Bone Springs and Wolfcamp formations. The production casing (7-inch) will be set in a competent geologic unit in the Devonian Thirty-one Formation at an approximate depth of 16,230 feet. The final completion will be constructed as a 5.875-inch, open-hole interval to a total depth of approximately 17,900 feet.

As shown in figures 3 and 4, the Independence AGI #1 well design will include a subsurface safety valve on the production tubing to assure that injected fluids are prevented from flowing back out of the well in the event of a failure of injection equipment. Additionally, the annular space between the production tubing and the well bore will be filled with an inert fluid (corrosion-inhibited diesel fuel with biocide additives) as a further safety measure. These practices are consistent with injection well designs previously supported by NMOCD and approved by the NMOCC for acid gas injection.

Design and material considerations for Independence AGI #1 include: 1) Placement of the subsurface safety valve (SSSV) and permanent injection packer; 2) installation of sufficient casing strings to isolate and protect groundwater resources (Ogallala and Santa Rosa formation groundwater, Rustler Formation saline groundwater) and active producing zones; 3) characterization of the zone of injection; and 4) a total depth (TD) ensuring accurate identification of the target reservoir.

A suitable drilling rig will be chosen for the job that will include an appropriate blowout preventer and choke-manifold system for any unforeseen pressure conditions encountered. Visual inspections of cement returns to the surface will be noted in all casing operations. Casing and cement integrity will be demonstrated by pressure testing and 360-degree cement bond logs recorded for each cement operation.

The four casing strings shown in Figure 4 are summarized in the following Table 1.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Table 1. Independence AGI #1 proposed casing schedule

Casing	Hole Size (in.)	Csg. Size (in.)	Pounds Per Foot	Grade	Thread	Top (ft.)	Bottom (ft.)	Length (ft.)
Proposed Casing								
Conductor	36	30.0	118	-	Welded	0	100	100
Surface	26	20.0	106.5	HCN-80	BTC	0	1400	1400
1st Intermediate	17.5	13.625	88.2	HCL-80	BTC	0	7150	7150
2nd Intermediate	12.25	9.625	47	HCL-80	BTC	0	9000	9000
2nd Intermediate	12.25	9.625	53.5	HCL-80	BTC	9000	13200	4200
Production	8.625	7	32	HPP110	BTC	0	15930	15930
Production	8.625	7	32	G3	VAM	15930	16230	300
Proposed Tubing								
Inj. Tubing	N/A	3.5	9.3	HCL-80	VAM	0	15880	15880
Inj. Tubing (CRA)	N/A	3.5	9.2	G3	VAM	15880	16180	300

Operations to drill Independence AGI #1 will utilize a closed-loop system to manage drilling fluids. Appendix C includes a preliminary drilling fluids program prepared by Artesia Lumber Co./Buckeye Inc. that outlines the anticipated mud program for the well. All casing strings will be cemented to the surface using appropriate conventional cement and methods. Pressure testing will be completed, and 360-degree cement bond logs will be recorded in order to verify the integrity of all cementing operations.

The 7-inch production casing will be set in a competent bed within the Devonian Thirty-one Formation at approximately 16,230 feet as described above (Table 1). The interval will be cemented in two stages utilizing a cement diverter tool (DVT) at a depth of approximately 15,930 feet. As shown in Table 1 above, approximately 300 feet of corrosion-resistant alloy (CRA) casing and tubing will be utilized to protect lower well components and assure well integrity in potentially corrosive conditions. To provide an additional layer of safety, this interval of CRA materials will be cemented utilizing Halliburton WellLock Resin, which is specially designed for use in corrosive conditions.

Table 2 below summarizes the preliminary cement program for all proposed Independence AGI #1 casing strings.

Table 2. Independence AGI #1 proposed cementing plan

Casing String	Stage #	Cement Type	# Sacks	Density (#/gallon)	Coverage Interval
Conductor	1	Redimix	-	-	0' – 100'
Surface	1	Lead: EconoCem Tail: HalCem C	Lead: 1725 Tail: 735	Lead: 12.9 Tail: 14.8	0' – 1,400'
1st Intermediate	1	NeoCem	1170	13.2	5,475' – 7,150'
1st Intermediate	2	NeoCem HalCem	Lead: 1930 Tail: 100	Lead: 11.0 Tail: 14.8	0' – 5,475'
2nd Intermediate	1	Lead: NeoCem Tail: VersaCem	Lead: 2030 Tail: 410	Lead: 11.5 Tail: 14.5	0' – 13,200'
Production	1	NeoCem	Lead: 332 Tail: 175	Lead: 11.0 Tail: 13.2	0' – 15930'
Production	2	Halliburton WellLock Resin	56 bbls	-	15930'-16230'

Permanent, continuous-recording sensors will be incorporated into the packer assembly and appropriate connections will be run through the annulus and out of the wellhead. These sensors will provide real-time reservoir temperature and pressure conditions. Data will be transmitted to the plant's control room for observation, analysis, and recording. Section 3.3 addresses how those data will be utilized and supplemented in the event of down-hole sensor failure.

The subsurface safety valve (SSSV) will be run into the well at a depth of approximately 250 feet and connected to a hydraulic surface control panel via a ¼-inch Inconel line.

The National Association of Corrosion Engineers (NACE) issues guidelines for metals exposed to various corrosive gases like those anticipated for this well. For a H_2S-CO_2 stream of acid gas that is dewatered at the surface via successive stages of compression, down-hole components, such as the SSSV and packer need to be constructed of Inconel 925 (or equivalent). The CRA joints utilized in Independence AGI #1 will be constructed of a similar alloy from a manufacturer, such as Sumitomo SM2550 (with 50% nickel content). Additionally, the gates, bonnets, and valve stems within the injection tree will also be nickel coated.

The remainder of the injection tree will be constructed of standard carbon steel components and outfitted with annular pressure gauges that report operating pressure conditions in real time to a gas-control center located remotely from the wellhead. In the case of abnormal pressures or any other situation requiring immediate action, the acid gas injection process can be stopped at the compressor and the wellhead shut in using a pneumatically operated wing valve on the injection tree. The SSSV provides a redundant safety feature to shut in the well in case the wing valve does not close properly. After the AGI well is drilled and tested to assure that it will capable of accepting the target volume of injection fluid (without using acid gas), it will be completed with the approved injection equipment for the acid-gas stream.

3.2 GEOPHYSICAL LOGGING

Prior to running the first and second intermediate and production casing strings, open-hole geophysical logging will be performed for the interval underlying the surface casing from 1,400 and 17,900 feet. The proposed open-hole logging suite will consist of the following: Gamma ray, formation density, resistivity, neutron porosity, sonic porosity, and 360-degree caliper measurements with integrated borehole volume. Additionally, Fullbore Formation MicroImager (FMI) logs will be recorded along the proposed injection interval, as well as the overlying caprock to verify the integrity and confirm the capability of overlying material to properly sequester the injected TAG. Porosity and permeability characteristics of the proposed injection zone and overlying caprock material will be verified through collection and analytical analysis of sidewall cores.

3.3 RESERVOIR STIMULATION, TESTING, AND PRESSURE MONITORING

Upon the completion of geophysical logging for Independence AGI #1, reservoir stimulation and testing operations will be completed. These operations include acid stimulation of the injection zone and step-rate injection testing.

Stimulation operations will include a two-stage acidizing treatment of the injection zone. First, a spot-acid treatment will be performed in which, approximately 3,000 gallons of 15% hydrochloric acid (HCl) will be displaced along the injection zone for approximately 24 hours. Subsequently, 20,000 gallons of 15% HCl will be injected into the reservoir to open potential reservoir-bound fractures and secondary porosity zones.

In addition to stimulation operations, an injection step-rate test (SRT) will be completed for Independence AGI #1. A temporary string of removable packer and tubing will be run to conduct the test and determine the final injection pressure and volumes to ensure the formation parting pressure (fracture pressure) is not exceeded during acid gas injection operations. Once the reservoir has been tested and safe operational conditions have been identified, the final 3.5-inch tubing string and permanent injection packer will be run in and set at an approximate depth of 16,230 feet.

The Independence AGI #1 will be equipped with bottom-hole pressure and temperature instrumentation designed to provide real-time monitoring of reservoir conditions as it is installed on a mandrel immediately overlying the permanent injection packer. While this equipment is useful in gathering data that will ultimately be used to evaluate reservoir and well performance, it is only a portion of the overall data collection and analysis program to evaluate the reservoir over time and to compare predicted reservoir performance (discussed in sections 3.4 and 3.5) with actual performance in future reporting periods.

The collection and analysis of injection and annular pressure data has a two-fold purpose. First, to provide an early warning of any mechanical well issues that may arise, and the second to provide data for reservoir performance evaluation. While the initial purpose of monitoring the mechanical integrity of the well only requires the surface injection pressure, temperature, rate, and annular pressure monitoring, the bottom-hole data provides the ability to analyze and evaluate the performance of the reservoir.

Surface pressure/temperature/annular pressure monitoring equipment has extremely high reliability, whereas our experience with bottom-hole pressure/temperature monitoring equipment has shown that this equipment is more complex and suffers from periodic data collection and transmission issues. We have developed a process to ensure that necessary data are collected in the event of bottom-hole sensor failure. The simultaneous collection of the surface- and bottom-hole data allows us to develop empirical relationships with actual observed data that, in conjunction with the use of established models (such as, AQUAlibrium ™, or equivalent) will allow us to fill in gaps when bottom-hole data loss occurs. This approach will allow us to provide NMOCD with reliable monitoring data and interpretations and provides the basis for reservoir evaluation, which will be performed periodically during the lifetime of the well.

Below is a summary of the overall data collection and analysis program proposed for this well and reservoir:

1. Obtain initial bottom-hole pressure and temperature after drilling (during logging)

2. Perform detailed step-rate injection test and 10-day reservoir pressure fall-off test to provide baseline conditions prior to the commencement of TAG injection

3. Monitor surface parameters (injection pressure, temperature, injection rate, and annular pressure) to provide an early warning system for any potential mechanical integrity issues in the well

4. Monitor bottom-hole pressure/temperature with a device to provide real-time reservoir condition data for analysis of reservoir performance

5. Use bottom-hole reservoir and surface pressure/temperature to develop a well-specific empirical relationship between observed surface- and bottom-hole data

6. Use TAG/wellbore model to predict bottom-hole P/T conditions based on surface data and test with empirical relationships observed in #5 above to calibrate models

7. Use surface data along with tools in #5 and #6 above to fill in missing bottom-hole data when data drop, or sensor failure occurs

8. In the event of an extended period of bottom-hole pressure/temperature sensor failure, perform periodic bottom-hole pressure monitoring using slickline pressure gauges only if data from such temporary device is necessary to fill in data for relevant analysis

9. After approximately 10 years of operation, perform another detailed step-rate injection test and fall-off test to compare with baseline prior to injection

3.4 INJECTION STREAM CHARACTERISTICS AND MAXIMUM ALLOWABLE OPERATING PRESSURE

The well will be designed and constructed such that it will serve as the injection conduit for a mixed stream of treated acid gas. Based on current estimates, the TAG stream used for the following calculation will be:

- Carbon Dioxide (CO_2) 70%
- Hydrogen Sulfide (H_2S) 30%
- Trace Nitrogen and C_1-C_7 Less than 1%

The maximum total volume of TAG to be injected daily will be approximately 12 MMSCF per day. Pressure reduction valves and controls will be incorporated to assure that maximum surface injection pressure approved by NMOCD will not be exceeded.

The specific gravity of TAG is dependent on the temperature and pressure conditions and the composition of the fluid mixture. It is most accurately calculated using a modification of the Peng-Robinson (PR) equation of state (EOS) model (Boyle and Carroll, 2002). We have calculated the specific gravity of the supercritical TAG phase for the proposed Independence AGI #1 using the AQUAlibrium ™ 3.1 software, which employs the modified PR EOS model (Table 3).

We have modeled the proposed maximum daily injection rate of 12 MMSCF per day composed of 70 mol% CO_2 and 30 mol% H_2S. Specific gravities of TAG were determined for these mixtures at the wellhead (2,500 psi, 115 ºF), the total depth of the well (8,800 psi, 210 ºF), and under average reservoir conditions (Table 3).

To determine the proposed maximum surface injection pressure, we utilize the following NMOCD-approved method, which is based on the final specific gravity of the injection stream. Utilizing this method, we propose a maximum allowable operating pressure (MAOP) of approximately 4,779 psi as determined in the calculations that follow:

MAXIMUM ALLOWABLE OPERATING PRESSURE (MAOP) DETERMINATION

$$IP_{Max} = PG(D_{Top})$$

WHERE:
IP_{Max} = Maximum Surface Injection Pressure (psi)
PG = Pressure Gradient of Injection Fluid (psi/ft)
D_{Top} = Depth at top of injection zone

AND

$$PG = 0.2 + 0.433\ (1.04 - SG_{TAG})$$

WHERE:
SG_{TAG} = Average specific gravity of treated acid gas in the tubing (SG_{TAG} at top = 0.76, and SG_{TAG} at bottom = 0.88; see Table 3)

For the maximum requested injection volume case, it is assumed that:

$$SG_{TAG} = 0.82\ (Average\ of\ 0.76\ and\ 0.88)$$

AND

$$D_{Top} = 16{,}230\ feet$$

THEREFORE

$$PG = 0.2 + 0.433(1.04 - 0.82)$$

$$PG = 0.294\frac{psi}{ft}$$

AND

$$IP_{Max} = 0.294\frac{psi}{ft}x\ 16{,}230\ feet$$

$$\boldsymbol{IP_{Max} = 4{,}779\ psi}$$

For this reason, Ameredev requests approval for a surface injection MAOP of 4,779 psi for the proposed Independence AGI #1.

Table 3. Anticipated TAG stream characteristics at wellhead, bottom of well, and in reservoir at equilibrium

Proposed Injection Stream Characteristics

TAG	H_2S	CO_2	H_2S	CO_2	TAG
Gas Volume (MMSCFD)	Conc. mol %	Conc. mol %	Injection Rate lbs/day	Injection Rate lbs/day	Injection rate lbs/day
12	30	70	341722	1029641	1371363

Conditions at Wellhead

Wellhead		TAG							
Temp F	Pressure psi	Gas Vol (MMSCFD)	Comp CO_2:H_2S	Inject Rate lbs/day	Density kg/m^3	SG	Density lbs/gal	Volume ft^3	Volume bbl
115	2500	12	70:30	1371363	764.09	0.76	6.38	28736	5118

Conditions at Bottom of Well

Wellhead		TAG							
Temp F	Pressure psi	$Depth_{Top}$ ft	$Depth_{Bot}$ ft	Thickness ft	Density kg/m^3	SG	Density lbs/gal	Volume ft^3	Volume bbl
210	8800	16230	17900	1670	879.67	0.88	7.35	24960	4446

Conditions in Reservoir at Equilibrium

Wellhead		TAG							
Temp F	Pressure psi	Avg. Porosity	S_{WR}	Porosity (ft)	Density kg/m^3	SG	Density lbs/gal	Volume ft^3	Volume bbl
200	8389	3.9	0.14	56.01	881.74	0.88	7.36	24908	4436

3.5 ACID GAS INJECTION PLUME MODELING

To evaluate the impact of operation of the proposed Independence AGI #1 on the target Siluro-Devonian reservoir, Geolex and MHA completed a detailed reservoir evaluation and injection modeling assessment. Components of this evaluation included: 1) Review of available subsurface data (e.g. geophysical logs, drill-stem and injection tests, 3D seismic survey data) to identify and estimate reservoir characteristics in the area of the proposed AGI well location, and 2) construction of a geologic simulation grid and injection modeling utilizing Schlumberger Petrel and Eclipse platforms, respectively.

3.5.1 Siluro-Devonian Reservoir Evaluation

Upon review of available subsurface data, eight discrete zones were identified within the target injection reservoir delineated by their porosity and permeability characteristics (Table 4). Within these zones, interpreted porosity types include solution-enhanced primary porosity (SEP), solution-enhanced fracture porosity (SEF), and small-fracture porosity (FX). Utilizing available log data, porosity within each zone was estimated utilizing the density-neutron cross-plot method.

Table 4. Summary of reservoir characteristics within each discrete zone identified in the Siluro-Devonian injection interval

Zone	Top	Base	Φ Type	Φ (Feet)	Avg. Φ	Φ Range	K Range (mD)	Avg. K (mD)
1	16230	16294	SEP	64	5.0%	3-10%	10-100	40
2	16294	16497	FX	203	2.0%	0-10%	0.1-10	1.0
3	16497	16584	FX + SEP	87	4.0%	1-7%	0.1-10	3
4	16584	17218	FX + SEP	634	1.0%	0-3%	0.1-5	0.75
5	17218	17378	SEP + SEF	160	8.0%	1-20%	10-400	140
6	17378	17561	SEP	183	6.0%	1-8%	10-100	50
7	17561	17684	SEP/SEF, FX	123	8.0%	1-16%	1.0-200	100
8	17684	17820	SEP/SEF, FX	136	8.0%	1-16%	1.0-200	100

Generally, average porosity values within each identified zone range from approximately 0% to 8% and the total proposed Siluro-Devonian injection interval exhibits an average porosity of 3.9%. Average permeability values were estimated where drill-stem tests, injection tests, or adequate resistivity log data were available and were further informed by extensive dolomite permeability studies of Lucia et al. (1995).

3.5.2 Acid Gas Injection Modeling

To simulate the proposed injection scenario and better understand the potential resultant acid gas injection plume after 30 years of operation at the maximum anticipated daily injection rate (12 MMSCF per day), Geolex collaborated with MHA to complete a detailed reservoir injection simulation. This modeling evaluation was completed utilizing Schlumberger Petrel to construct a geologic simulation grid informed by the previously described reservoir evaluation and available well data in the area of Independence AGI #1. Schlumberger Eclipse was then utilized to conduct injection simulations representative of the proposed injection scenario described in this application.

The geologic simulation grid constructed as the environment in which the proposed injection scenario was simulated is comprised of 292 simulation layers characterizing the eight distinct intervals identified within the proposed injection reservoir. The simulation model area covers approximately 20 square miles and includes nearby subsurface features and relevant nearby injection wells (Figure 5). In total, the simulation grid contains 923,000 cells with areal dimensions of 500 by 500 feet.

Porosity and permeability characteristics within the simulation environment were defined utilizing available well-log data, 3D seismic survey impedance data, and reservoir characteristics identified during the evaluation discussed in Section 3.5.1. From existing well data (West Jal B Deep #1 and West Jal Unit #1) and a synthetic DPHI log generated for the proposed Independence AGI #1 location (up-scaled to reflect enhanced porosity identified in review 3D seismic survey impedance data) a model distribution for porosity, and subsequently permeability, was generated (Figure 6). Model permeability distribution was determined using the Winland R35 method as normal and beta distribution methods generated no instances of simulation cells with permeability less than 0.1 mD.

As only two wells located in the area of Independence AGI #1 have available log data to be utilized in defining model porosity characteristics, 3D seismic survey impedance data were utilized to define key areas of low porosity areas within the simulation grid. This was accomplished by implementing four pseudo-well control points (Figure 7), which would allow the injection simulation to evaluate low porosity regions within the model environment without enhancing porosity values across the total area of the model. Also included in Figure 7 are model-generated porosity distribution maps of key intervals identified to be the primary receivers of acid-gas injectate.

Upon construction of the model simulation grid, the proposed injection scenario was simulated utilizing the Schlumberger Eclipse simulation platform. Specific scenarios simulated include operation of the proposed AGI at the maximum anticipated injection rate with and without continuous and coincident operation of the nearby West Jal B Deep #1 saltwater disposal well (SWD). Model sensitivity testing identified this well as the only nearby injection source with the potential to influence the dispersion pattern of the Independence AGI #1 injection plume. Subsurface faults in the area of review were assumed to be non-transmissive of fluids (sealed) as 3D seismic survey impedance data suggest very low to no porosity near these features.

Figures 8 and 9 illustrate the results of Eclipse injection modeling for the proposed Independence AGI #1. After 30 years of injection at the maximum anticipated rate of 12 MMSCF per day, the resultant acid gas plume would occupy an area of approximately 4 square miles and reach a maximum of 1.6 miles from the AGI well bore if the West Jal B Deep #1 well is not in operation. When operating, the plume footprint is predicted to cover an area of approximately 5.5 square miles and extend a maximum of 1.8 miles from the AGI well bore when non-zero saturation levels are considered. Gas-saturation levels of 20% and 10% are predicted to extend a maximum of 1.26 miles and 1.5 miles from the AGI wellbore, respectively. Table 5 below summarizes the fraction of acid gas being received by each identified zone within the injection reservoir and shows that the primary fluid receivers correspond to upper Devonian, Wristen/Fusselman, and lower Fusselman strata. Saturation levels within the resultant plume reach a maximum of 50% in the immediate area of the AGI wellbore and are observed to be substantially lower in the outer portions of the plume.

Table 5. Summary of injectate fractions predicted to be received by each identified zone within reservoir upon completion of 30-year injection simulation

West Jal B Deep #1 Not Injecting			**West Jal B Deep #1 Injecting 15,000 bpd**		
Zone #	Total Vol. (MMSCF)	Total Injectate Fraction	Zone #	Total Vol. (MMSCF)	Total Injectate Fraction
1	19,451	14.8%	1	21,852	16.6%
2	976	0.7%	2	1,207	0.9%
3	1,222	0.9%	3	1,532	1.2%
4	2,725	2.1%	4	3,190	2.4%
5	82,541	62.8%	5	82,293	62.6%
6	10,725	8.2%	6	11,731	8.9%
7	5,619	4.3%	7	4,090	3.1%
8	8,223	6.3%	8	5,588	4.2%

3.5.3 Potential for Vertical Migration of Acid Gas to Overlying Productive Zones

Results of Independence AGI #1 injection simulations predict that some fraction of acid gas injectate will exhibit a dispersion pattern such that gas reaches the intersection point of local fault features in the area. These features may be interpreted to represent potential conduits allowing the vertical transmission of acid gas out of the target injection reservoir and into overlying productive zones. To address this concern, Geolex reviewed available drilling fluid records in the area of the proposed Independence AGI #1 and published literature evaluating regional reservoir pressure conditions in the Delaware Basin.

Illustrated in Figure 10 are wells and associated drilling fluid densities utilized while drilling through overlying producing zones in the area of Independence AGI #1. Above the proposed Siluro-Devonian injection reservoir mud weights utilized range from 12.1 to 15.1 pounds per gallon (ppg). For those wells identified that penetrate the proposed injection reservoir, fluid records indicate utilization of less dense fluids (Average of 9.0 ppg). These records support the interpretation that overlying producing zones in

this area are over-pressured with respect to the target injection reservoir. Additionally, in preparation for drilling the proposed Independence AGI #1, a preliminary Drilling Fluid Program was designed for the well by Artesia Lumber Co. (Appendix C). Artesia recommends utilizing drilling fluids between 12.4 to 12.9 ppg immediately overlying the injection zone (13,000 to 16,000 feet) and 10.0 to 11.0 ppg from 12,300 to 13,000 feet.

Over-pressured reservoir conditions within the Lower Bone Springs to Woodford formation strata have been recognized in many areas of the eastern Delaware Basin (Luo et al., 1994). Rittenhouse et al. (2016) generated a regional pore-pressure model of the Delaware Basin informed by over 23,700 drilling fluid recordings and more than 4,000 drill-stem and fracture injection tests. As shown in Figure 11, these compiled fluid records and testing operations indicate increased pore-pressure gradients from Lower Bone Springs to Woodford Formation strata expressed in the utilization of heavier drilling fluids. Normal pressure conditions are observed to return underlying the Woodford Shale.

Based on the record of local drilling fluids utilized and extensive records compiled by Rittenhouse et al. (2016), the proposed Siluro-Devonian injection reservoir at this location is anticipated to be under-pressured with respect to overlying strata. Under these conditions, there is no anticipated potential for the vertical migration of acid gas out of the target reservoir as the pressure differential between the over- and under-pressured intervals will act as a barrier impeding vertical migration, even along open conduits.

4.0 REGIONAL AND LOCAL GEOLOGY AND HYDROGEOLOGY

4.1 GENERAL GEOLOGIC SETTING AND SURFACE GEOLOGY

The proposed Independence AGI #1 site is located in Section 20, T25S, R36E in Lea County, New Mexico, approximately six miles west of Jal (Figure 1). The well location lies on the eastern flank of the Pecos River Basin within the Javelina Basin. Referred to as the South Plain by Nicholson & Clepsch (1961), the region exhibits irregular topography without integrated drainage. Surficial sediments commonly consist of unconsolidated alluvium and eolian sands in areas. There are no observed surface bodies of water, or groundwater discharge sites within one mile of the proposed location. The proposed site overlies Quaternary alluvium overlying the Triassic redbeds of the Santa Rosa Formation (Dockum Group), both of which are local sources of groundwater. The thick sequences of Permian rocks that underlie these deposits are described generally below.

4.2 BEDROCK GEOLOGY

The proposed Ameredev gas-processing facility and AGI well will be located along the eastern margin of the Delaware Basin, a sub-basin of the larger, encompassing Permian Basin (Figure 12), which covers a large area of southeastern New Mexico and west Texas. The Permian as we know it today began to take form during the Middle to Late Mississippian, with various segments (Delaware Basin, Midland Basin, Central Basin Platform, and North Platform) arising from the ancestral Tabosa Basin. The Delaware Basin was subsequently deepened by periodic deformation during the Hercynian Orogeny of the Pennsylvanian through Early Permian. Following the orogeny, the Delaware Basin was structurally stable and gradually was filled by large quantities of clastic sediments while carbonates were deposited on the surrounding shelves and was further deepened by basin subsidence.

Figure 13 illustrates a generalized Permian Basin stratigraphic column showing the anticipated formations and lithologies that underlie the proposed well site. The entire Lower Paleozoic interval (Ellenburger through Devonian) was periodically subjected to subaerial exposure and prolonged periods of karsting, most especially in the Fusselman and Devonian intervals. The result of this exposure was development of systems of karst-related secondary porosity, which included solution-enlargement of fractures and vugs, and the development of small cavities and caves. Particularly in the Fusselman, solution features from temporally distinct karst events became interconnected with each successive episode of subaerial exposure, so there is the potential for vertical continuity in parts of the Fusselman that could lead to enhanced vertical and horizontal permeability.

In this area of the Permian Basin, major tectonic activity was primarily confined to the lower Paleozoic section, where seismic data show major faulting and ancillary fracturing affecting generally only as high as the lower Woodford Shale. As the proposed Independence AGI #1 lies relatively close to the Central Basin Platform margins, faulting related to the Hercynian orogeny may be present higher in the stratigraphic section.

The sub-Woodford Paleozoic rocks extend down to the Ordovician Ellenburger Formation, which is separated from underlying basement rock by a limited interval of Early Ordovician sandstones and granite wash. The Ellenburger is comprised of dolomites and limestones and is up to several hundred feet in thickness. It is overlain by approximately 880 feet of Ordovician Simpson Formation sandstones and tight limestones, as well as approximately 200 feet of basal Montoya cherty carbonates.

The Silurian Fusselman and Wristen, and Devonian Thirty-one formations overlie the Montoya Formation, and are comprised of interbedded dolomites and dolomitic limestones that are capped by the Woodford Shale. The Woodford Shale is overlain by several hundred feet of tight Osagean limestone and

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

several hundred feet of shale and basinal limestones of the Upper Mississippian Chester Formation. The overlying Pennsylvanian Morrow, Atoka, and Strawn formations complete the pre-Permian section. Within this entire sequence, there has been historical gas production from the Strawn, however, currently all are plugged. The proposed Silurian-Devonian injection zone does not produce economic hydrocarbons in the area of the proposed Independence AGI #1.

4.3 LITHOLOGIC AND RESERVOIR CHARACTERISTICS OF THE SILURO-DEVONIAN FORMATIONS

The proposed injection interval includes the Devonian Thirty-one and Silurian Wristen and Fusselman formations, collectively referred to as the Siluro-Devonian. These strata include numerous intervals of dolomites and dolomitic limestones with moderate to high primary porosity. Additionally, the proposed injection interval includes significant regions of secondary, solution-enlarged porosity produced during periods where strata were subaerially exposed and significant karst features developed. These karst features most frequently developed in the Fusselman Formation and include solution cavities and enlarged fracture and fracture networks through the Siluro-Devonian section, which can be substantial enough to provide additional permeability that is not readily apparent on geophysical well logs. The porous zones of the Siluro-Devonian are separated by tight limestones and dolomites.

In evaluating the proposed Independence AGI #1 location, Geolex completed an in-depth review of licensed seismic survey data (WesternGeco – South Lea Survey) to support the evaluation that the proposed Siluro-Devonian reservoir exhibited sufficient porosity potential to accommodate the needs of the Independence AGI #1 well. Seismic inversion data, specifically impedance attributes, were evaluated to identify reservoir targets with significant porosity potential in the Siluro-Devonian reservoir. As a result of this review, the proposed section 20 location was selected as it was observed to overly an expansive region of porosity in the upper Devonian, Wristen, and Fusselman formation strata.

Based on the geologic evaluation of the subsurface, acid gas injection is recommended between depths of approximately 16,230 to 17,900 feet. Figure 14 includes a type log of the proposed injection zone that includes the formation tops identified at that location and illustrates the sufficient low-porosity intervals overlying the target injection reservoir. Anticipated formation tops underlying the proposed Independence AGI #1 location are included in the following Table 6. In the area of the proposed well, depth to Devonian strata increases to the southwest and the proposed AGI location lies downdip of a structural high to the east (Figure 15).

Units overlying the proposed injection interval provide excellent caprock to prevent the upward migration of injectate out of the target reservoir. This caprock includes 316 feet of dense Woodford Shale overlain by at least 973 feet of tight Mississippian limestone (Figures 14 and 16). These units will provide an excellent geologic seal above the porous carbonates of the injection zone providing protection to shallow groundwater resources and overlying pay intervals.

Figure 16 includes structural cross section A-A’ covering the area of the proposed Independence AGI #1 and highlights the lateral extent of available upper Devonian porosity and the regional coverage of overlying caprock in the area. As shown in Figure 15, there are two faults located approximately one mile from the proposed AGI. These structures were identified through review of licensed 3D seismic survey data and are discussed further in Section 4.6.

Table 6. Anticipated formation tops at proposed Ameredev AGI # 1 location

FORMATION	DEPTH (FEET)	FORMATION	DEPTH (FEET)
Dockum	246	Bone Springs	8,286
Ochoa-Dewey	867	Wolfcamp	10,979
Rustler	1,271	Strawn	11,340
Salado	1,825	Atoka	12,590
Tansill	3,124	Morrow	13,759
Yates	3,274	Barnett	14,941
7 Rivers	3,454	Osage	15,388
Queen	3,541	Woodford	15,914
Capitan Reef	3,977	Devonian	16,230
Bell Canyon	5,469	Wristen	16,575
Cherry Canyon	6,246	Fusselman	17,320
Brushy Canyon	7,098	Montoya	17,820

4.4 CHEMISTRY OF THE RESERVOIR FLUIDS

A review of formation waters from the U.S. Geological Survey National Produced Waters Geochemical Database v. 2.3 identified 21 wells with analyses of fluid samples collected from the Siluro-Devonian interval. These samples were collected from wells within approximately 15 miles of the proposed Independence AGI #1 (Section 20, T25S, R36E) and the results of laboratory analysis to determine their composition are summarized in Table 7.

Table 7. Summary of Siluro-Devonian produced water analyses from nearby wells (U.S. Geological Survey National Produced Water Geochemical Database v. 2.3)

API	Well Name	CONCENTRATION (parts per million)							
		TDS	HCO3	Ca	Cl	K + Na	Mg	Na	SO4
3002510945	Hill-federal D 1	112959	288	6264	67390	34340	1912	-	2765
3002510947	EC Hill-federal 1	35639	-	1369	22070		592	11608	-
3002511126	JR Holt A3	116415	154	7501	71110	34680	1767	-	1203
3002511196	S. Mattix Unit 3	68431	990	3180	40960	21690	974	-	637
3002511202	S. Mattix Unit 11	67130	853	5075	40430	16950	2348	-	1474
3002511383	Hodges B 3	81712	722	4320	47500	25400	1030	-	2740
3002511556	Blocker-federal 4	57675	595	2850	34030	18370	619	-	1211
3002511747	Ab Coates FED D2	82794	977	2408	47200	28190	851	-	3168
3002511760	Ida Wimberley 5	63817	360	2774	35870	20750	621	-	3442
3002811763	Ida Wimberley 9	61040	900	2680	35600	19560	800	-	1500
3002511765	Carlson-federal A3	66418	690	3002	37650	20390	1339	-	3347
3002511812	Clyde Lanehart 1	99879	687	4753	60410	32610	828	-	591
3002511818	Copper 1	27506	1089	1384	15270	8144	540	-	1079
3002511863	Arnott Ramsay B3	158761	476	17240	100300	35400	5345	-	-
3002511886	Dabbs 1	101036	540	5393	61630	30380	2183	-	910
3002511890	Sam Dabbs 1	85150	675	5368	50260	25130	1395	-	2322
3002511907	Arnott Ramsay F9	58220	367	1546	32790	-	278	20430	2816
3002511950	Farnsworth FED 6	31931	302	7196	20450	1151	2241	-	591
3002512272	LE Elliott FED H1	58687	761	3004	35460	18980	482	-	-
3002512286	JB McGhee 1	62392	552	2696	34380	20060	702	-	4002
3002521601	North Custer Mt 1	7000	1610	2136	36230	21830	403	-	1950

These analyses report Total Dissolved Solids (TDS) in the area of the proposed AGI well ranging from 7,000 to 158,761 parts per million (ppm) with an average of 71,647 ppm. The primary constituent in sampled formation waters is the chloride ion, with an average concentration of 44,142 ppm.

Based on these data, the Siluro-Devonian reservoir fluids are anticipated to be completely compatible with the acid gas injectate, however, an attempt will be made to sample formation fluids during drilling and completion of the proposed Independence AGI #1 to provide more site-specific fluid properties and verify our assessment of fluid compatibility.

4.5 GROUNDWATER HYDROLOGY IN THE VICINITY OF THE PROPOSED AGI WELL

Based on the New Mexico Water Rights Database from the New Mexico Office of the State Engineer, there are 15 water wells and points-of-diversion located within a two-mile radius of the proposed Independence AGI #1 well, and only two water wells within a one-mile radius. Of these wells, the closest is located approximately 0.33 miles away and has a total depth of 505 feet (Figure 17; Table 8). The remaining wells within the two-mile radius are shallow, collecting water from approximately 240 to 600 feet deep in Alluvium and the Triassic redbeds. The shallow freshwater aquifer will be protected as the proposed well design isolates shallow zones via a four-string casing design including a surface casing interval that extends to 1,400 feet with the Rustler Formation, effectively isolating shallow groundwater resources (Figure 4).

The area surrounding the proposed injection well is arid and there are no bodies of surface water within a two-mile radius.

Table 8. Water wells within one mile of the proposed Independence AGI #1 (Retrieved from the New Mexico Office of the State Engineer's Files on July 8, 2020)

POD #	Source	Use	Owner	LAT (NAD83)	LONG (NAD83)	Distance (miles)	Depth (feet)	Date Completed
CP 1170 POD 5	Shallow	Commercial	NGL South Ranch	32.121417	-103.296667	0.33	505	11/2014
CP 465 POD 1	Shallow	Commercial	NGL South Ranch	32.119465	-103.299882	0.53	560	08/1963

Geolex conducted a review of *Geology and Ground-Water Conditions in Southern Lea County, New Mexico* (Nicholson and Clebsch, 1961) to identify published groundwater data representative of nearby water wells in the area of the proposed Independence AGI #1. Table 9 summarizes the wells identified in this review and the results of those analyses.

Table 9. Chemical analysis results of samples collected from water wells in the area of the proposed Independence AGI #1 (Nicholson and Clebsch, 1961 – *Geology and Groundwater Conditions in Southern Lea County, New Mexico*)

Historical Owner	Location (T-R-S)	Location (Qtr-Qtr)	Depth (ft)	Ca (ppm)	Mg (ppm)	Na+K (ppm)	HCO_3 (ppm)	SO_4 (ppm)	Cl (ppm)	NO_3 (ppm)
Sun Oil Co.	25-37-15	NE/4 NE/4	-	307	98	271	145	737	610	9
City of Jal	25-37-19	NE/4 NE/4	500	55	49	170	376	280	71	0.4
City of Jal	25-37-19	SE/4 NE/4	450	34	43	175	264	286	54	0.5
City of Jal	25-37-20	NW/4 SW/4	70	-	-	-	150	145	168	7.6

Our analysis confirms that the proposed well poses no risk of contaminating groundwater in the area as 1) The proposed well design includes material considerations to protect shallow groundwater resources,

and 2) there are no identified conduits that would facilitate migration of injected fluids to freshwater-bearing strata.

4.6 POTENTIAL FOR INDUCED SEISMICITY IN THE AREA OF INDEPENDENCE AGI #1

To evaluate the potential for seismic events in response to injected fluids, Geolex conducted an induced-seismicity risk assessment in the area of the proposed Independence AGI #1. This estimate 1) Models the impact of eight injection wells over a 30-year injection period, and 2) estimates the fault-slip probability associated with the simulated injection scenario. This analysis was completed utilizing the Stanford Center for Induced and Triggered Seismicity's (SCITS) Fault Slip Potential (FSP) model developed by Walsh and Zoback, 2016.

To identify subsurface structures in the area of the proposed AGI well, Geolex evaluated and interpreted licensed seismic survey data (WesternGeco South Lea Survey) covering the Lea County area of interest. Based on this review, Geolex identified eight subsurface faults in the area of Independence AGI #1 (Figure 18). The closest fault is observed to be located approximately one mile east of the proposed well. Major faults in the area (those exhibiting significant lateral extent) generally strike NNW-SSE with minor faults striking NE-SW and NW to SE.

Due to the location of faults relative to active and proposed injection wells and the general low density of injection wells in the immediate area of the proposed AGI well, it is anticipated that the proposed disposal scenario will not pose any elevated risk of injection-induced fault slip. To support the interpretation that these structures would not be affected by operation of Independence AGI #1 as proposed, a fault-slip probability analysis was completed to quantify the risk associated with injection operations in the area of the proposed well.

To calculate the fault-slip probability for this injection scenario, input parameters characterizing the local stress field, reservoir characteristics, subsurface features, and injected fluids area required. Parameters utilized and their sources for this study area are included in Table 10. Additionally, Table 11 details the injection volume characteristics and locations of the disposal wells modeled in this scenario. To ensure the model simulations provide a conservative estimation of induced-seismicity risk, injection wells included in the simulations were modeled utilizing their maximum anticipated daily injection volumes as recorded by NMOCD records. With the exception of Jal North Ranch SWD #1 (API 30-025-27085), wells in which the maximum anticipated injection volumes were not identifiable in review of NMOCD documents, a value of 25,000 barrels injected per day was assumed. Due to the minimal reported injection volume of the Jal North Ranch SWD #1, a potential of 10,000 bpd was assumed in the event that injection rates increase as a result of increased need or any future workover that may improve the injectivity of this well.

Table 10. Input parameters and source material for FSP model simulations

Modeled Parameter	Input Value	Variability (+/-)	UOM	Source
Stress				
Vertical Stress Gradient	1.05	0.105	psi/ft	Nearby well estimate
Max Horizontal Stress Direction	N75E	5	Deg	Lund Snee & Zoback, 2018
Reference Depth	17000		ft	Nearby well evaluation
Initial Res. Pressure Gradient	0.43	0.043	psi/ft	Lund Snee & Zoback, 2018 Nearby well evaluation
A_ϕ Parameter	0.6	0.06	-	Lund Snee & Zoback, 2018
Reference Friction Coefficient (μ)	0.6	0.06	-	Standard value
Hydrologic				
Aquifer Thickness	1500	0	ft	Nearby well evaluation
Porosity	3.5	0.35	%	Nearby well evaluation
Permeability	25	2	mD	Nearby well evaluation
Material Properties				
Density (Water)	1040	40	Kg/m^3	Standard value
Dynamic Viscosity (Water	0.0008	0.0001	Pa.s	Standard value
Fluid Compressibility (Water)	3.6×10^{-10}	0	Pa^{-1}	Standard value
Rock Compressibility	1.08×10^{-9}	0	Pa^{-1}	Standard value
Acid Gas Properties @ 8,800 psi & 210 ºF				
Density	879.67	-	kg/m^3	AQUAlibrium™
Dynamic Viscosity	9.542×10^{-5}	-	Pa.s	AQUAlibrium™

Table 11. Location and characteristics of injection wells modeled in the FSP assessment

#	API	Well Name	LAT	LONG	Volume (bbls/day)	Start (year)	End (year)
1	-	Independence AGI #1	32.120855	-103.291021	5250	2020	2050
2	3002524287	Crosby Deep #2	32.089508	-103.166733	6800	2010	2050
3	3002525046	West Jal B Deep #1	32.132091	-103.280708	15000	2015	2050
4	3002527085	Jal N. Ranch SWD #1	32.139347	-103.203911	10000*	2017	2050
5	3002543360	Kimberly SWD #1	32.083537	-103.194274	20000	2019	2050
6	3002544954	Chapman SWD #1	32.138797	-103.248988	25000	2020	2050
7	3002545346	Screech State SWD #1	32.136621	-103.368190	25000*	2020	2050
8	3002545795	Sholes Deep SWD #1	32.110998	-103.201266	30000	2020	2050

*****NMOCD records include no information regarding the maximum anticipated injection volume

Daily maximum injection volumes utilized in the fault-slip probability model range from 10,000 to 30,000 bpd (Table 11). In submission of this application, Ameredev is requesting approval to operate the proposed Independence AGI #1 for a period of at least 30 years, however, the duration of the FSP model simulation was increased to 40 years in order to characterize the reservoir effects of disposal wells that are currently operating and have been in operation since 2010. Figure 19 shows the resultant pressure front and single-well radial pressure solutions, as predicted by the FSP model, after 30 years of injection at the maximum injection rates.

For this study, limitations of the FSP model required a conservative approach be taken in determining the fault-slip probability of the injection scenario. Specifically, the FSP model is only capable of considering a single set of fluid characteristics and this study aims to model an injection scenario that includes saltwater disposal (SWD) and acid gas injection (AGI) systems. To ensure a conservative fault-slip

probability estimate, the proposed AGI well was simulated utilizing the characteristics of a SWD injectate. This approach yields a more conservative model prediction as water displays greater density, dynamic viscosity, and is significantly less compressible than acid gas. For comparison, characteristics of acid gas at the anticipated reservoir conditions, as modeled by AQUAlibrium™, are shown in Table 10.

Generally, faults considered in this assessment are predicted by the Stanford FSP model to have very low potential for injection-induced slip and the proposed Independence AGI #1 is not predicted by the model to contribute significantly to the estimate of risk (Table 12, Figure 20). Table 12 summarizes the predicted pressure change along each fault and includes the model-derived pressure change necessary to induce slip for each feature. Fault-slip probability values range from 0.00 to 0.05 with the majority of fault segments predicted to have zero probability of slip (Table 12). Major faults (faults 4, 7, and 8) in the area, which would have the greatest energy release potential upon slip, are predicted to have zero probability for slip in response to the modeled injection scenario. As shown in Table 12, when the contribution of the proposed AGI well is excluded, no significant changes in slip probability are predicted.

Table 12. Summary of model-simulation results showing the required pressure change to induce fault slip, actual change in pressure as predicted by the FSP model, probability of fault slip at the end of the 30-year injection scenario, and fault-slip probability when the proposed AGI is excluded from simulation

Fault #	Segment #	ΔPressure necessary to induce fault slip	Actual ΔPressure at 2050	Fault Slip Potential at 2050	FSP (excluding AGI)
1	1	3137	126	0.00	0.00
	2	4357	121	0.00	0.00
	3	1786	112	0.00	0.00
	4	1201	105	0.01	0.01
2	5	1197	210	0.04	0.03
3	6	6869	162	0.00	0.00
	7	6298	152	0.00	0.00
4	8	5645	239	0.00	0.00
	9	4610	176	0.00	0.00
	10	5005	114	0.00	0.00
	11	2709	73	0.00	0.00
	12	5302	66	0.00	0.00
	13	6339	61	0.00	0.00
	14	6899	55	0.00	0.00
	15	4197	60	0.00	0.00
5	16	1101	197	0.03	0.02
	17	1085	206	0.03	0.02
6	18	1554	220	0.05	0.04
7	19	6012	283	0.00	0.00
	20	6680	221	0.00	0.00
	21	6914	121	0.00	0.00
	22	6758	58	0.00	0.00
	23	6931	33	0.00	0.00
	24	6590	25	0.00	0.00
8	25	6508	277	0.00	0.00
	26	6327	312	0.00	0.00
	27	5455	288	0.00	0.00
	28	6305	148	0.00	0.00
	29	6684	78	0.00	0.00

In summary, no structures included in the modeled simulations are predicted to be at increased risk for injection-induced slip in response to the injection scenario presented. Features estimated to have non-zero slip potential are generally smaller-scale features and predicted probabilities are very low (probability ≤ 0.05). Furthermore, subsequent model simulations in which contribution from the proposed AGI is excluded illustrate that operation of the AGI well will have little impact on conditions near the identified faults in the area due to significantly lower proposed injection volumes in comparison to nearby SWD wells.

5.0 OIL AND GAS WELLS IN THE INDEPENDENCE AGI #1 AREA OF REVIEW AND VICINITY

Appendix A summarizes in detail all NMOCD recorded wells within a one- and two-mile radius of the proposed Independence AGI #1. These wells are shown in figures A-1 and A-2 and include active, plugged, and permitted well locations. Table A-1 details all wells within two miles of the proposed AGI well location and wells located within one mile are summarized in Table 13 below.

In total, there are 19 wells within a two-mile radius of the proposed Independence AGI #1 (Appendix A, Figure A-1, Table A-1). Of these, there are two active wells, nine permitted, and eight plugged. Active wells in the area include one SWD well completed across Strawn through Fusselman zones and one well producing from the Delaware pool.

Within one mile of the proposed AGI, there are six wells, of which, one is active and four are plugged (Figure A-2, Table 13). Additionally, there is one location permitted, but has not yet been drilled or completed.

Table 13. Wells located within one mile of the proposed Independence AGI #1 (Additional details are provided in Appendix A Table A-2)

API	Well Name	Pool	Status	LAT (NAD83)	LONG (NAD83)	TVD	Miles from AGI
3002509778	Federal #1	Wildcat	Plugged	32.121242	-103.297806	3891	0.4
3002521172	West Jal Unit #1	Del., Strawn	Plugged	32.117596	-103.280739	17086	0.64
3002520857	West Jal B #1	Delaware	New	32.128483	-103.284981	12275	0.67
3002521039	West Jal 18 #1	Wildcat	Plugged	32.127602	-103.300995	12950	0.75
3002538059	Dinwiddie ST COM #1	Strawn	Plugged	32.124851	-103.276459	12192	0.9
3002525046	West Jal B Deep #1	Strawn-Fus.	Active	32.132091	-103.280708	18945	0.98

There are two wells within two miles of the proposed AGI location that penetrate the anticipated injection interval (Table 14). Of these wells, one is an active SWD (West Jal B Deep #1) located approximately 0.98 miles from the proposed location. This well was drilled to a total depth of 18,945 feet and is permitted to inject through perforated intervals of Strawn through Fusselman strata. Despite being granted approval for injection into the Fusselman (approved June 2014), NMOCD records document no reports of work to drill out plugged intervals at 14,200 feet. One C-103 (submitted November 2018) indicates the intent of BC&D operating to drill out these intervals, but no subsequent reports confirming completion of this work have been identified. Additionally, reported injection volumes for this well do not appear to exhibit any significant increase that might indicate this work was completed.

The remaining well penetrating the proposed interval is the plugged West Jal Unit #1, located approximately 0.64 miles from the AGI location. Final plugging operations were completed in April 1984 and all relevant plugging reports and documents are included in Appendix A. The well is properly cemented through the injection zone and it is not anticipated to be negatively affected by the operation of Independence AGI #1.

Table 14. Wells located within two miles of Independence AGI #1 that penetrate the proposed injection interval

API	**Well Name**	**Pool**	**Status**	**LAT (NAD83)**	**LONG (NAD83)**	**TVD**	**Miles from AGI**
3002521172	West Jal Unit #1	Del., Strawn	Plugged	32.117596	-103.280739	17086	0.64
3002525046	West Jal B Deep #1	Strawn-Fus.	Active	32.132091	-103.280708	18945	0.98

6.0 IDENTIFICATION AND REQUIRED NOTIFICATION OF OPERATORS, SUBSURFACE LESSEES, AND SURFACE OWNERS WITHIN THE AREA OF REVIEW

Ameredev II, LLC completed a detailed review of Lea County, New Mexico land records to obtain a listing of all operators, oil and gas mineral leases, and surface owners within a one-mile radius of the proposed AGI well. Appendix B includes the results from that review.

Table B-1 summarizes the surface owners, Table B-2 identifies the operators, and Table B-3 lists working interest owners in the one-mile area of review. Table B-4 includes a list of all persons that must be notified at least 20 days prior to the NMOCC hearing. Figure B-1 shows the location of the surface owners and active operators, and Figure B-2 includes information on leaseholders and mineral ownership within one mile of the proposed AGI well location.

Interested parties will be provided a letter of notice informing them of submission of the C-108 application to NMOCD as well as a true and complete copy of the application and all supporting materials. Appendix B includes a copy of the notice letter text that will be provided to the required parties. Individual notices will be sent and copies of the individual notice letters and certified mail receipts, and copies of the newspaper notice and affidavit of publication, will be provided to the Commission after the receipt of a case number and a date for the hearing.

7.0 AFFIRMATIVE STATEMENT OF LACK OF HYDRAULIC CONNECTION BETWEEN THE PROPOSED INJECTION ZONE AND KNOWN SOURCES OF DRINKING WATER

As part of the work performed to support this application, a detailed investigation of the structure, stratigraphy, and hydrogeology of the area surrounding the proposed Independence AGI #1 well has been performed. The investigation included the analysis of available geologic data and hydrogeologic data from wells and literature identified in sections 3.0, 4.0, and 5.0 above including related appendices. Based on this investigation and the analysis of these data, it is clear that there are no open fractures, faults, or other structures which could potentially result in the communication of fluids between the proposed injection zone and any known sources of drinking water or oil/gas production in the vicinity, as described above in sections 4.0 and 5.0 of this application.

I have reviewed this information and affirm that it is correct to the best of my knowledge.

Alberto A. Gutiérrez, R.G.
President
Geolex, Inc.®

Signature: _____ Date: 7/10/2020

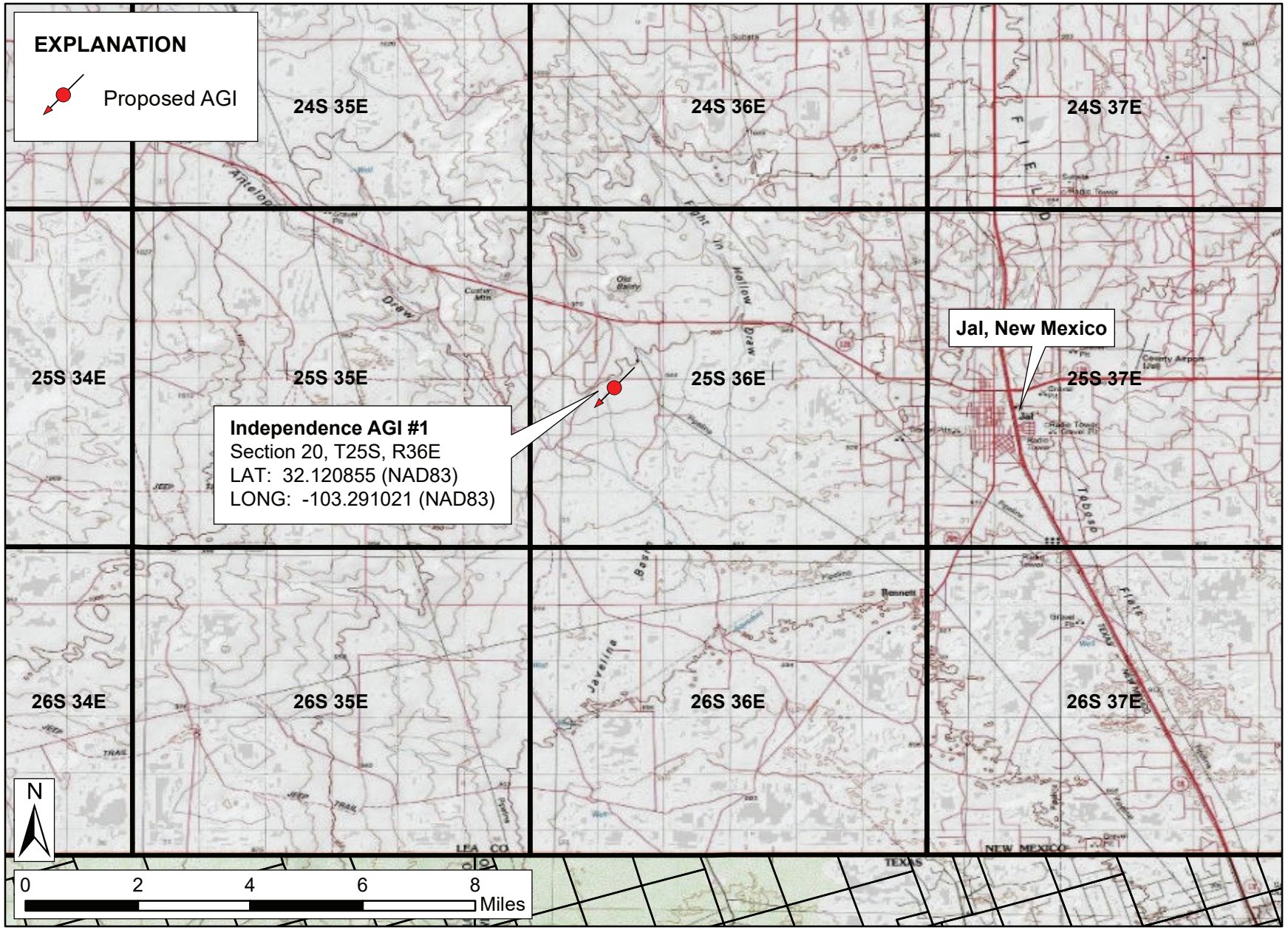

Figure 1. General location map for proposed AGI well in Section 20 (T25S, R36E) approximately six miles west of Jal, New Mexico

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

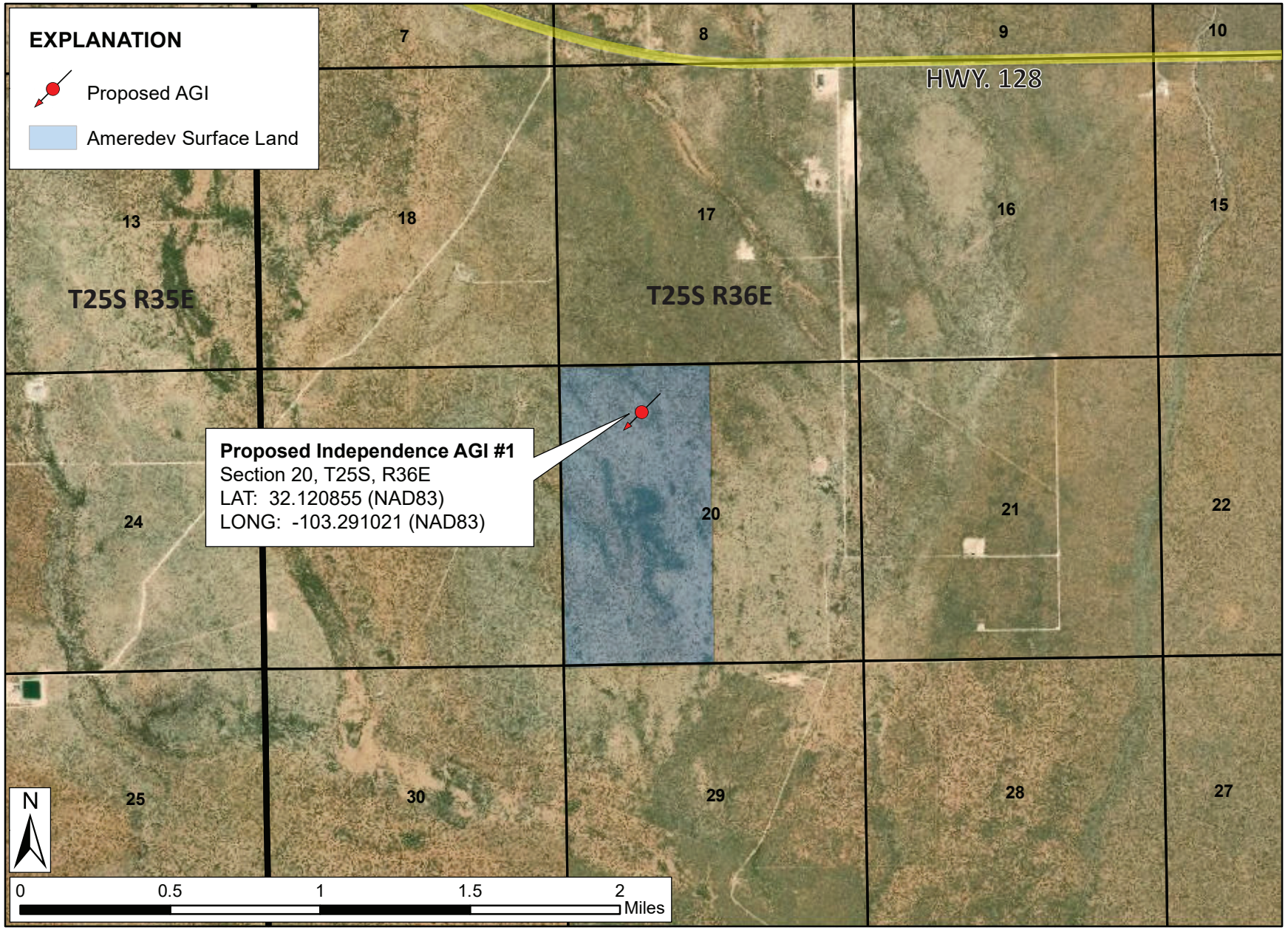

Figure 2. Detailed location map showing the proposed Independence AGI #1 and Ameredev surface lands where plant facilities will be constructed

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

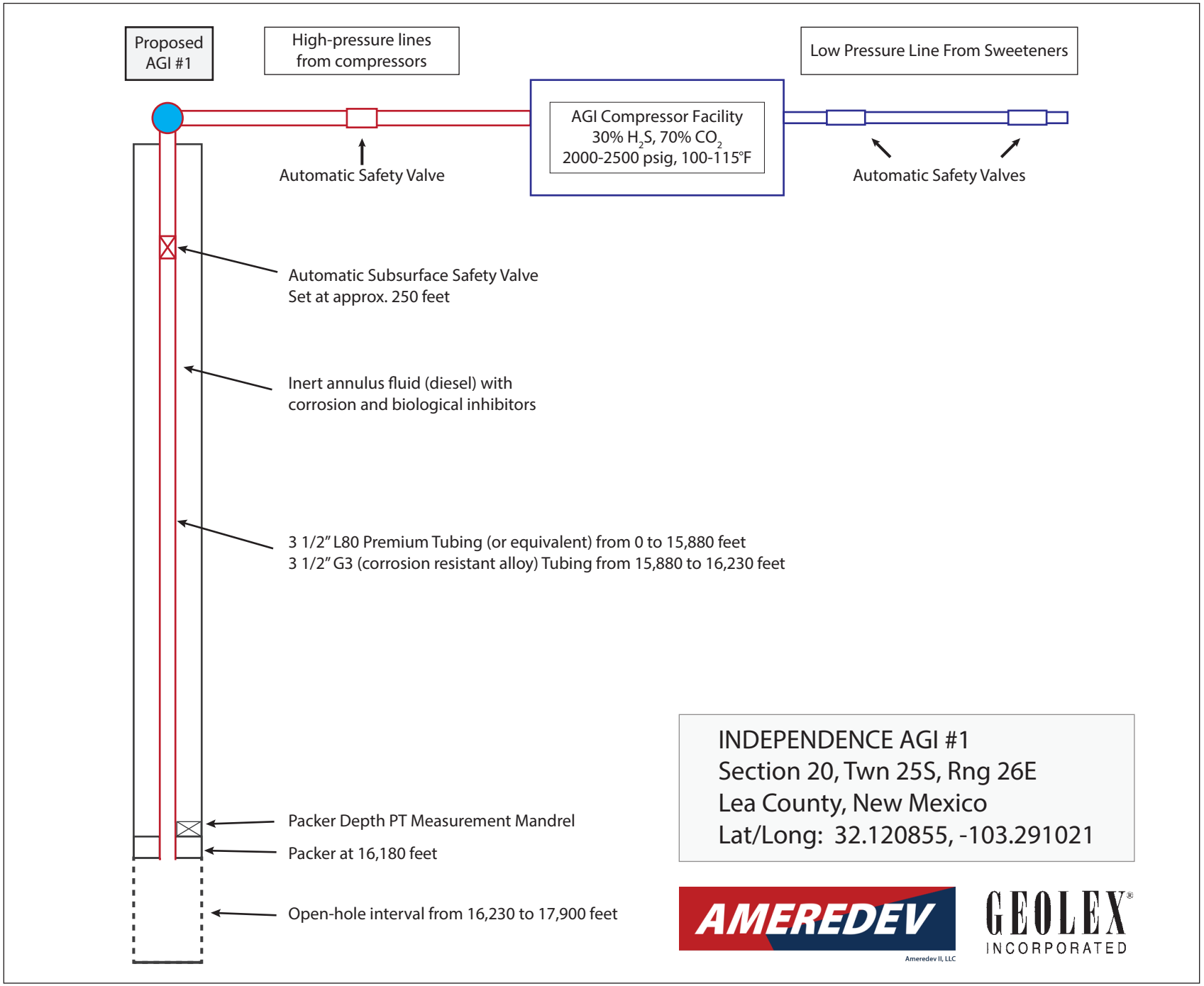

Figure 3. General schematic of surface facilities and proposed Independence AGI #1

PROPOSED WELL SCHEMATIC
INDEPENDENCE AGI #1
S20 - T25S - R36E

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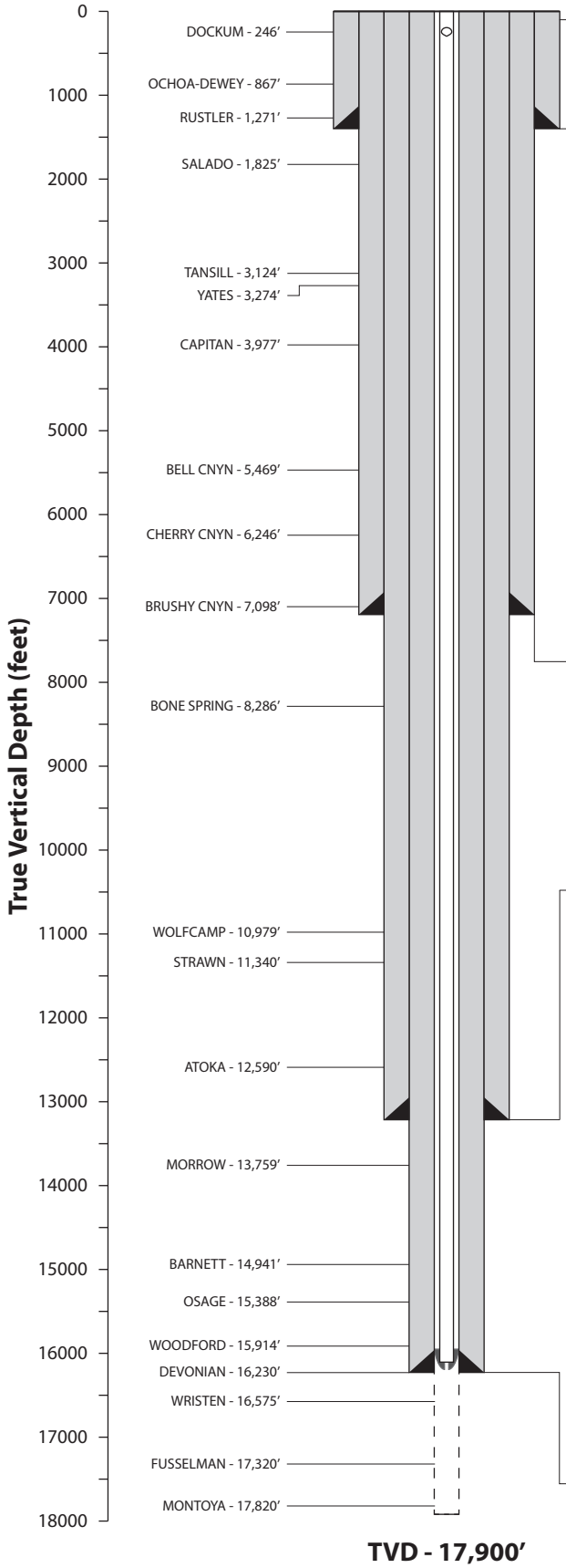


30" CONDUCTOR PIPE to 100'

SURFACE CASING 26" OH

20", 106.5 #/ft., HCN-80, BTC from 0' to 1,400'

LEAD	TAIL
1,725 sacks - EconoCem	735 sacks - HalCem C
12.9 #/gallon	14.8 #/gallon

Subsurface Safety Valve set @ approx. 250'

FIRST INTERMEDIATE CASING 17-1/2" OH

13-5/8", 88.2 #/ft., NT-80, BTC from 0' to 7,150'

STAGE 1 CEMENT (5,475' to 7,150')

1,170 sacks - NeoCem 5,475' to 7,150'
13.2 #/gallon

STAGE 2 CEMENT (0' to 5,475')

LEAD:	TAIL:
1,930 sacks - NeoCem	100 sacks - HalCem
11.0 #/gallon	14.8 #/gallon

SECOND INTERMEDIATE CASING 12-1/4" OH

9-5/8", 47 #/ft., HCL-80 BTC from 0' to 9,000'
9-5/8", 53.5 #/ft., HCL-80, BTC from 9,000' to 13,200'

LEAD	TAIL
2,030 sacks - NeoCem	410 sacks - VersaCem
11.5 #/gallon	14.5 #/gallon

PRODUCTION CASING 8-5/8" OH

7", 32 #/ft., HP-P110, BTC from 0' to 15,930'
7", 32 #/ft., G3 (CRA), VAM from 15,930' to 16,230'

STAGE 1 CEMENT (0' to 15,930')

LEAD:	TAIL:
665 sacks - NeoCem	175 sacks - NeoCem
11.0 #/gallon	13.2 #/gallon

STAGE 2 CEMENT (15,930' to 16,230')

56 bbls - WellLock
(Resin Cement)

TUBING AND EQUIPMENT

3-1/2", 9.3 #/ft., HCL-80 (or equivalent), VAM from 0' to 15,880'
3-1/2", 9.3 #/ft., Inconel G3 (CRA), VAM from 15,880' to 16,180'

Halliburton BWD permanent packer set at approx. 16,180'
Halliburton P/T sensors on mandrel above permanent packer
Inert annular fluid (diesel) with corrosion and biological inhibitors

5-7/8" OPEN-HOLE INTERVAL 16,230' to 17,900'

All depths are approximate and subject to change based on drilling and geology encountered

Figure 4. Proposed Independence AGI #1 well schematic

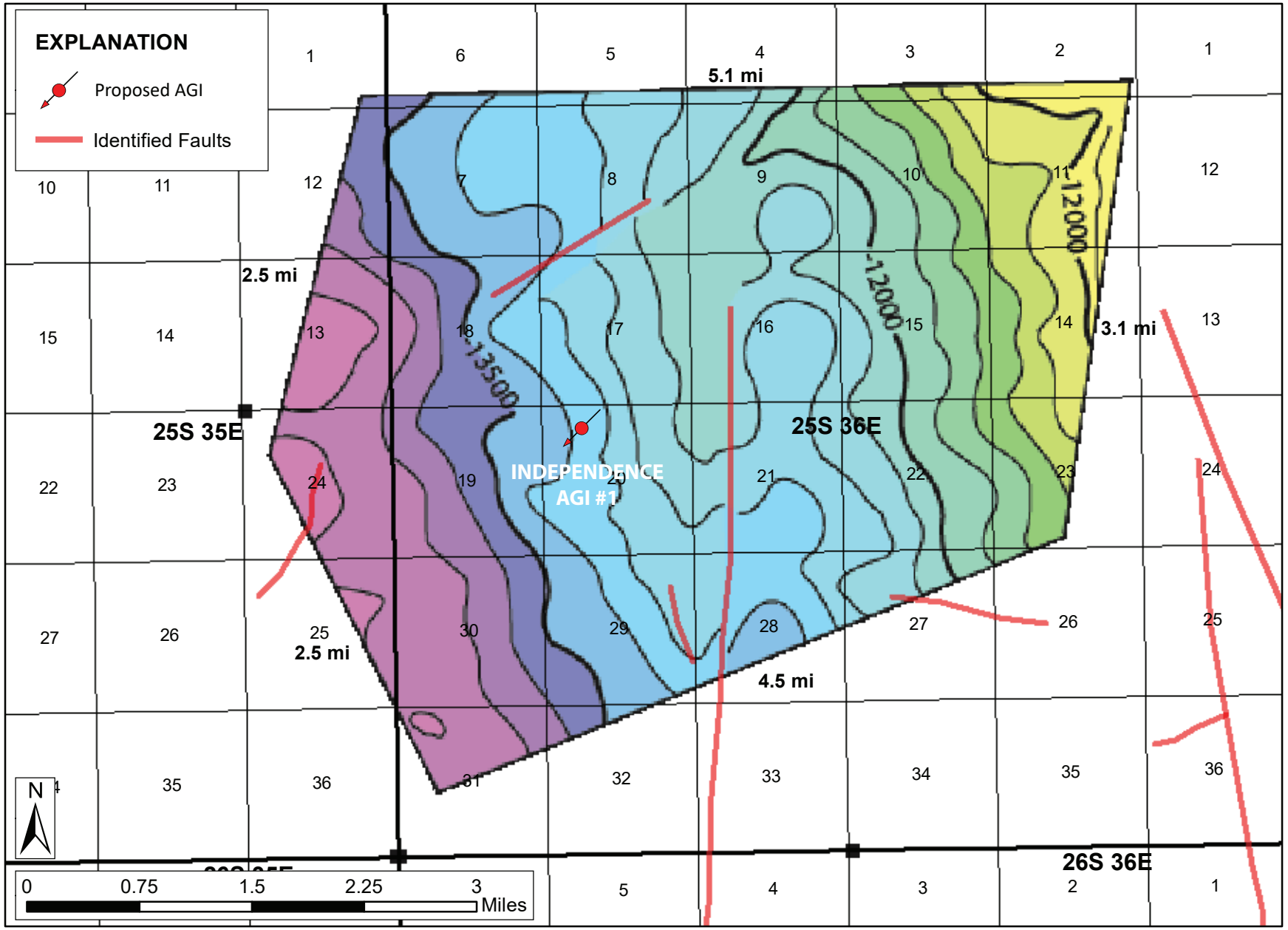
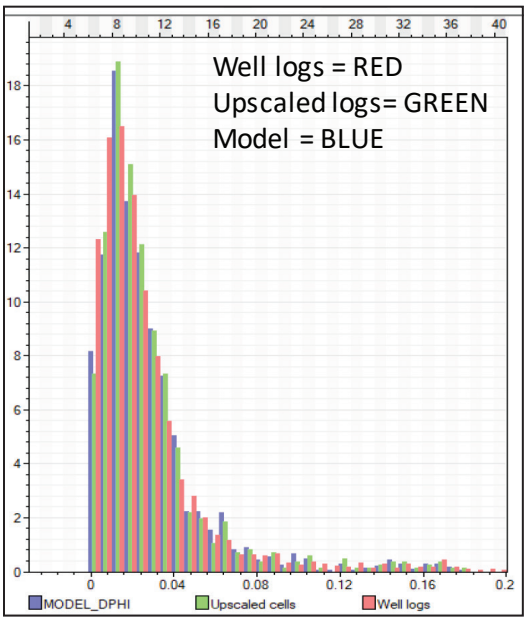
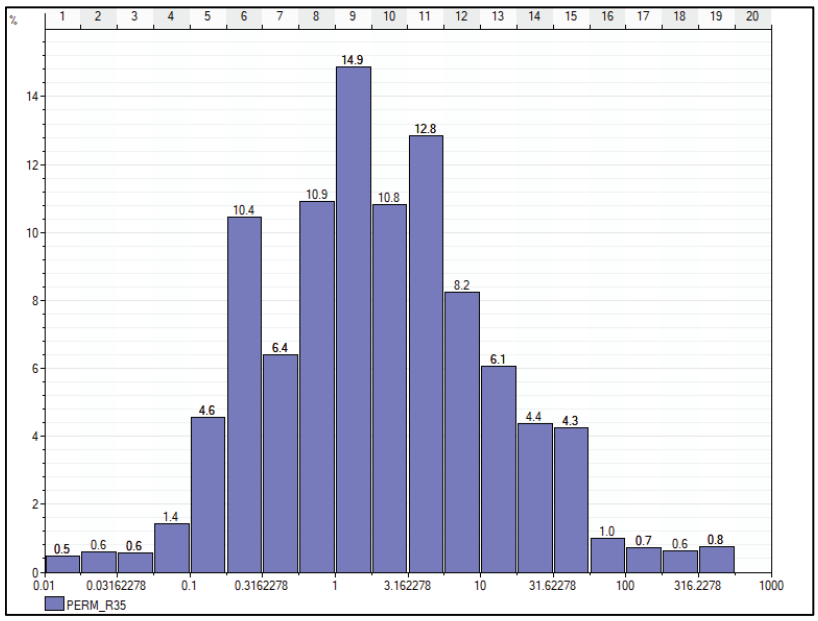


Figure 5. Location map illustrating areal extent of geologic model grid constructed to simulate the proposed Independence AGI #1 injection scenario. Total coverage area of approximately twenty square miles.

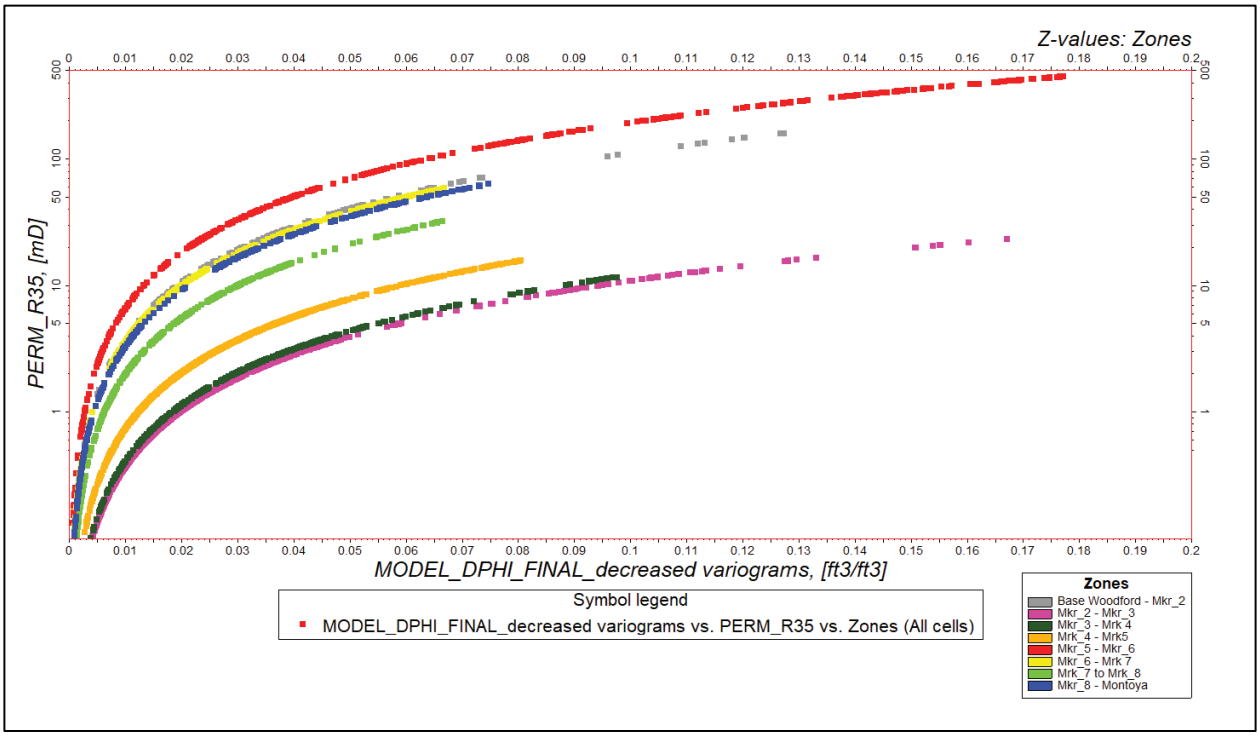
MODEL SIMULATION GRID CHARACTERISTICS



DPHI Distribution
(2 available well logs)

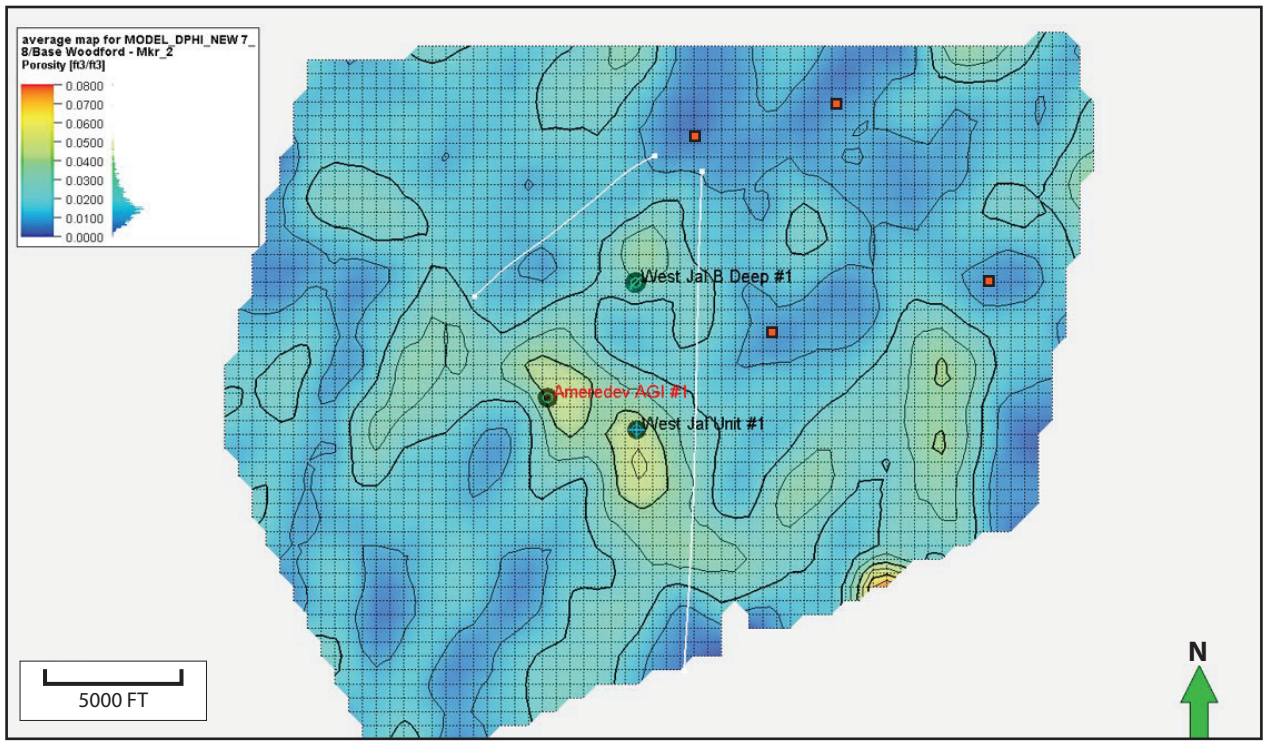


Winland R35 Permeability Distribution

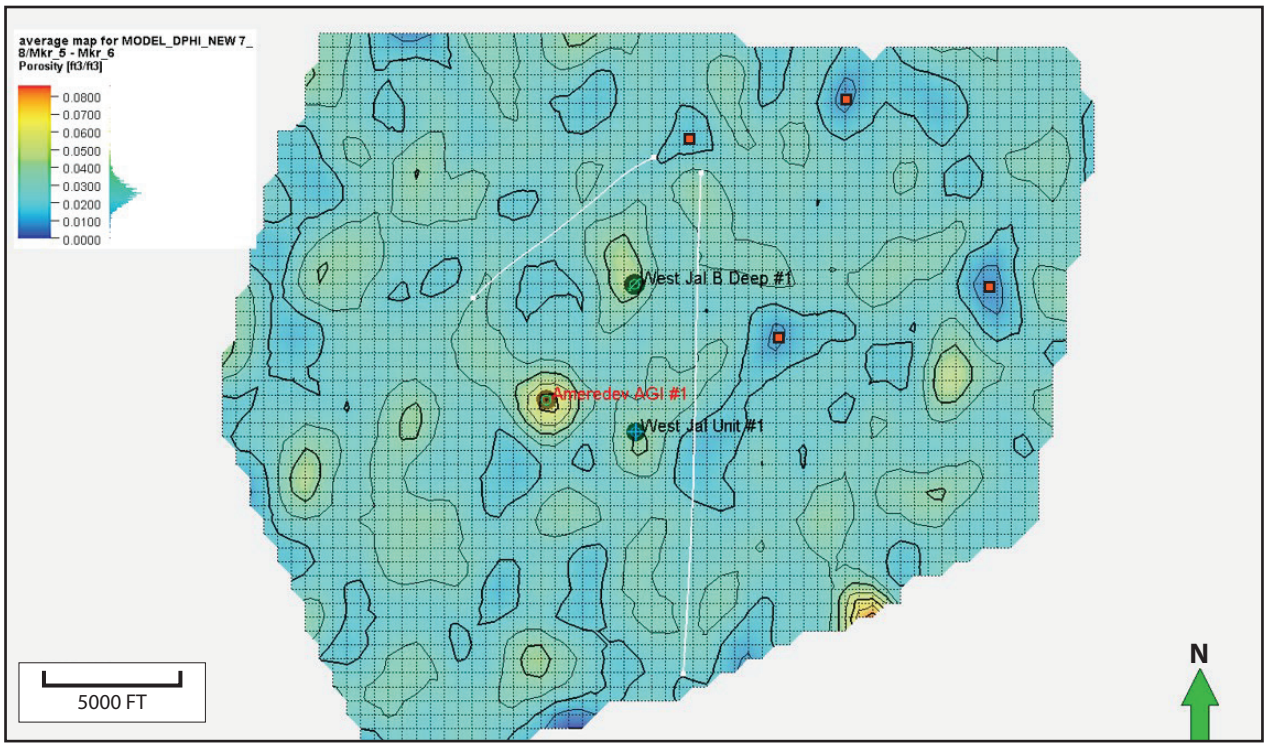


Permeability (Winland R35) vs. Model DPHI

Figure 6. Geologic model porosity and permeability distribution generated from available wells (n=2), and further informed by drill-stem and injection test, and 3D seismic survey impedance data



Zone 1 Porosity Distribution (upper Devonian)



Zone 5 Porosity Distribution Map (Wristen/Fusselman)

Figure 7. Model porosity distribution maps for two zones (Zone 1 and Zone 5) predicted to receive the greatest fraction of acid gas injectate (approximately 15% and 62%, respectively). Pseudo wells implemented to characterize low porosity zones identified via review of seismic impedance data are included (orange squares)

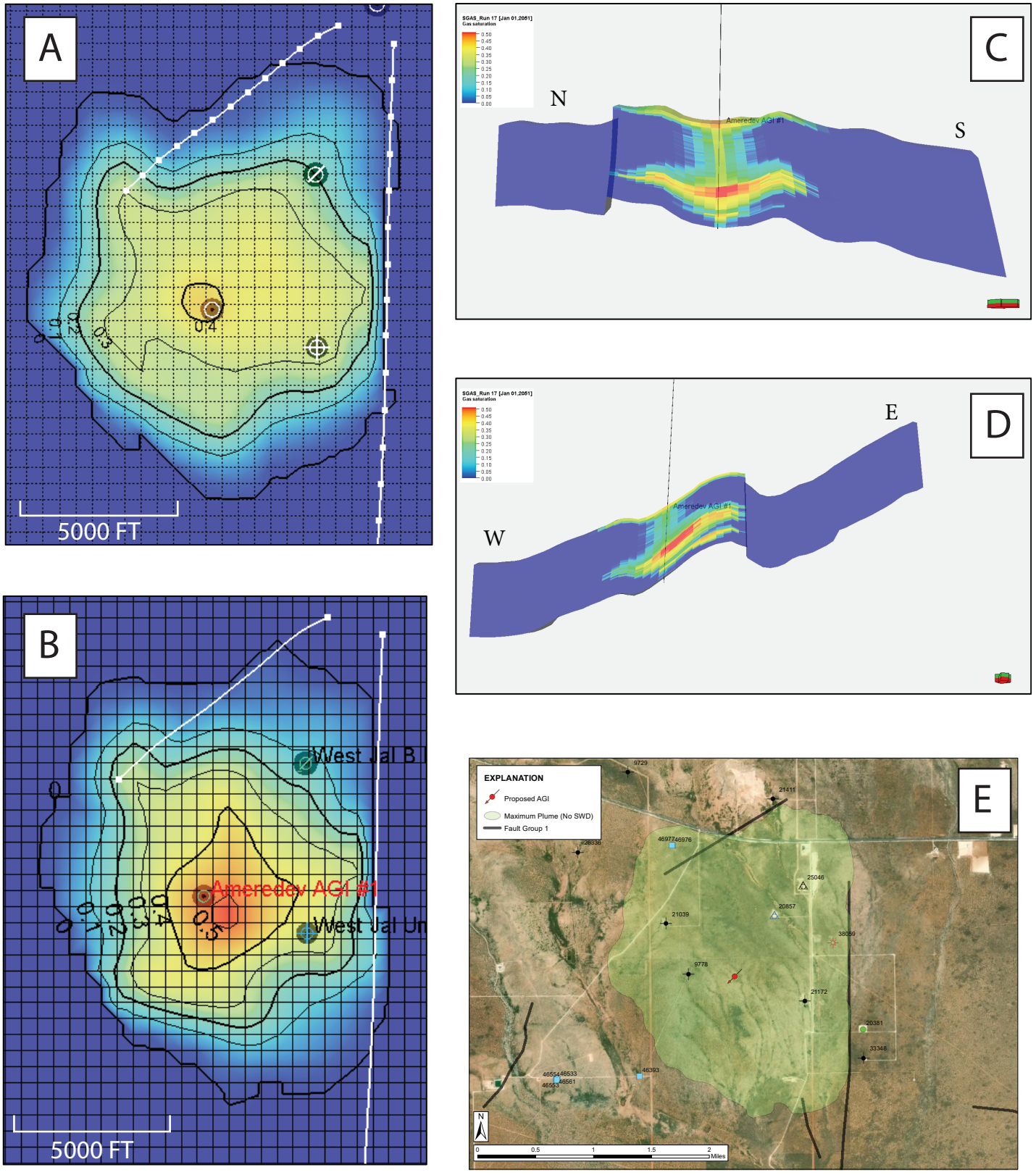


Figure 8. Summary of ECLIPSE injection simulation results when West Jal B Deep #1 is not actively injecting. Panels A and B include gas saturation maps for identified zones 1 and 5; panels C and D illustrate cross-sectional view of the resultant injection plume; panel E illustrates combined zone 1 and zone 5 plume footprint

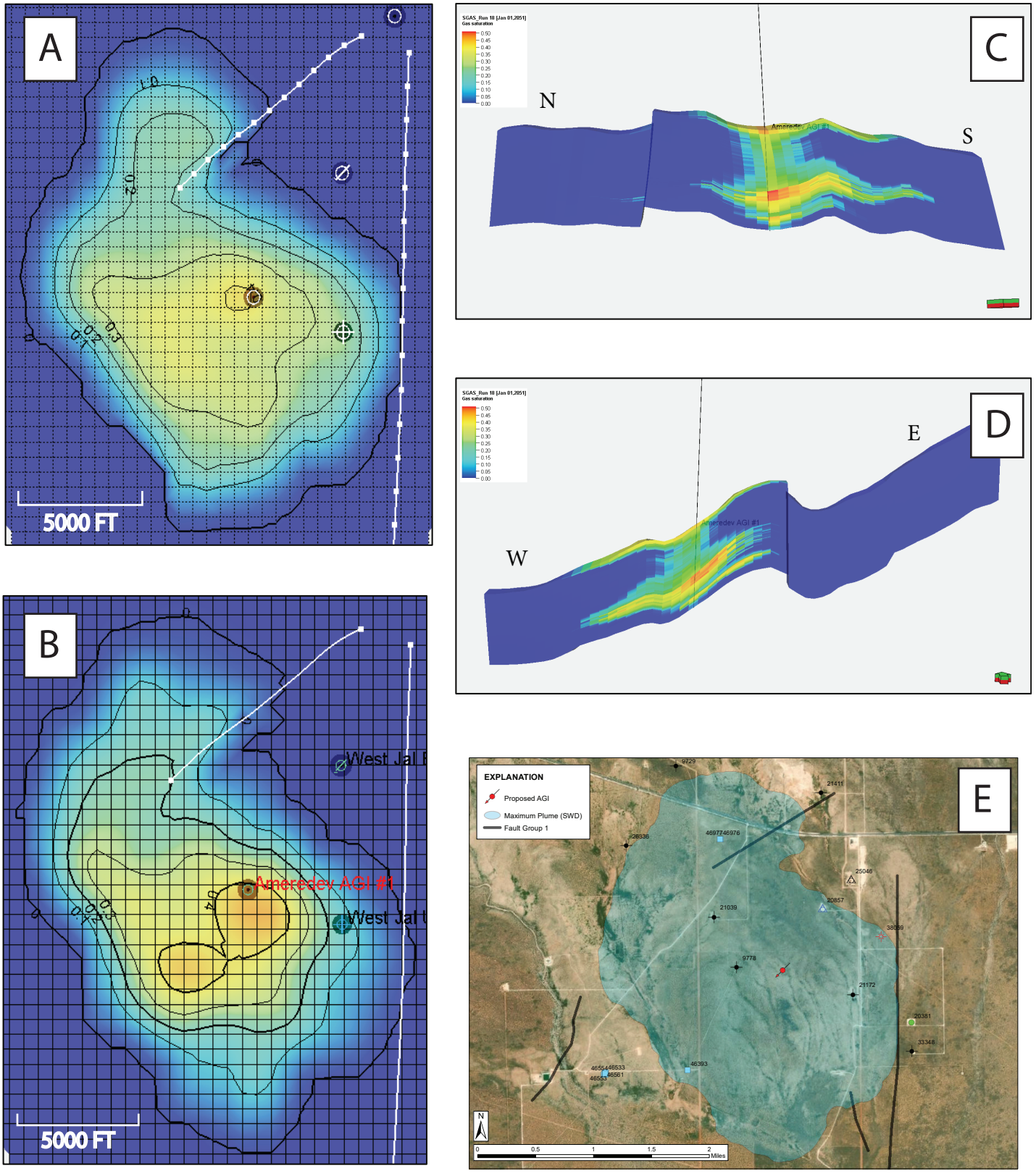


Figure 9. Summary of ECLIPSE injection simulation results when West Jal B Deep #1 is actively injecting. Panels A and B include gas saturation maps for identified zones 1 and 5; panels C and D illustrate cross-sectional view of the resultant injection plume; panel E illustrates combined zone 1 and zone 5 plume footprint.

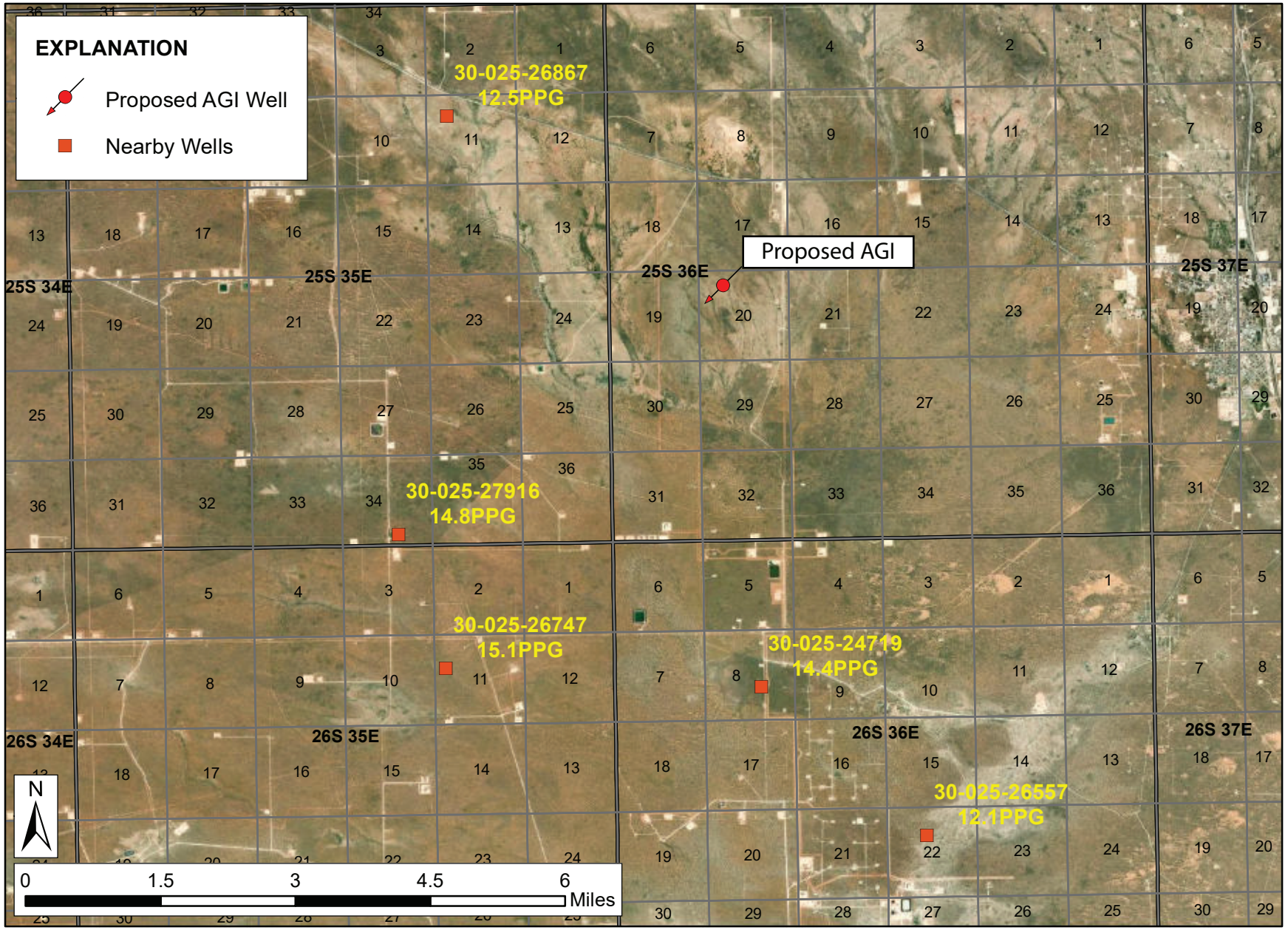
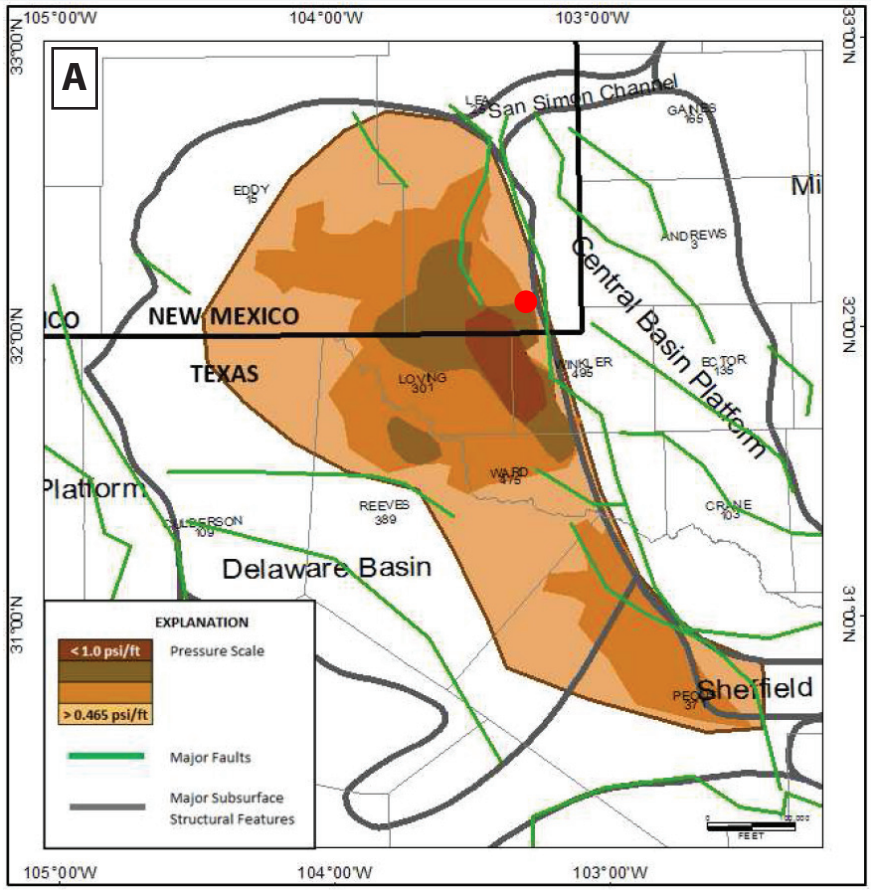


Figure 10. Location map summarizing drilling fluid weights utilized while drilling through overlying productive intervals and strata directly above the proposed injection zone



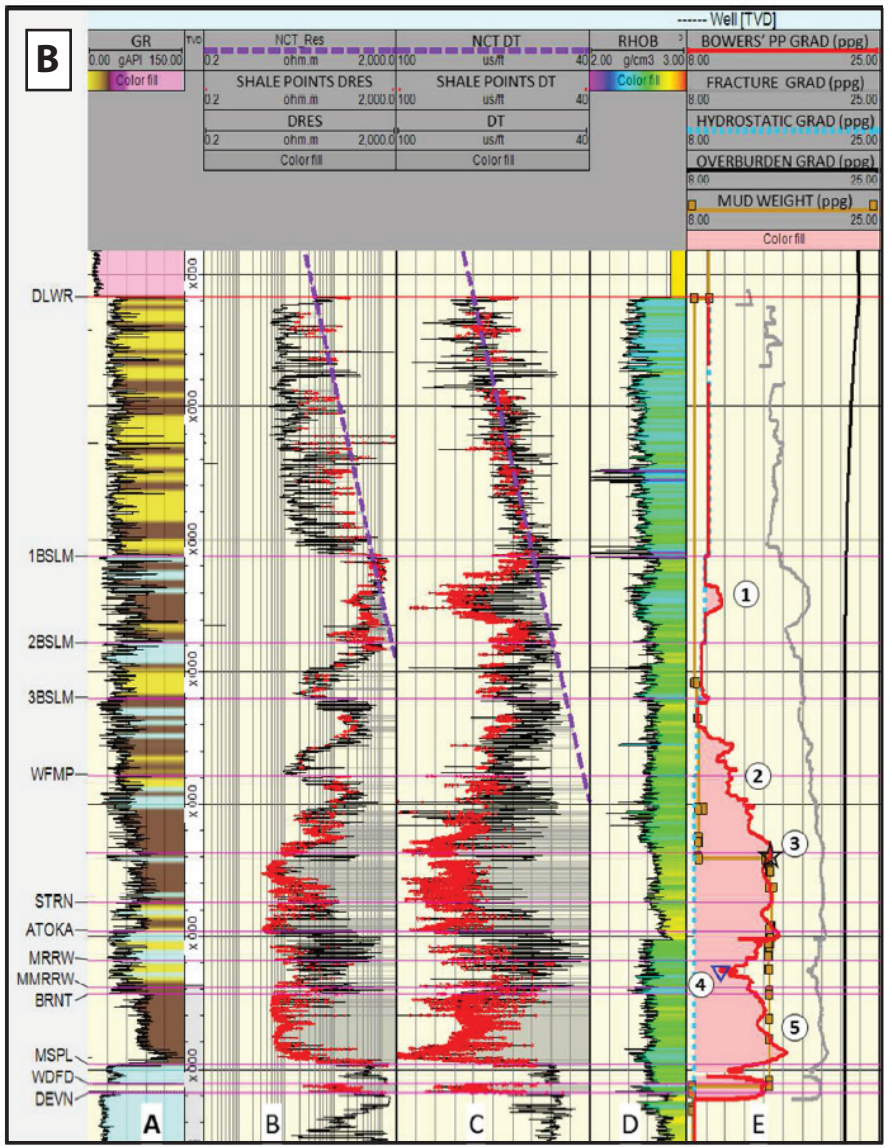
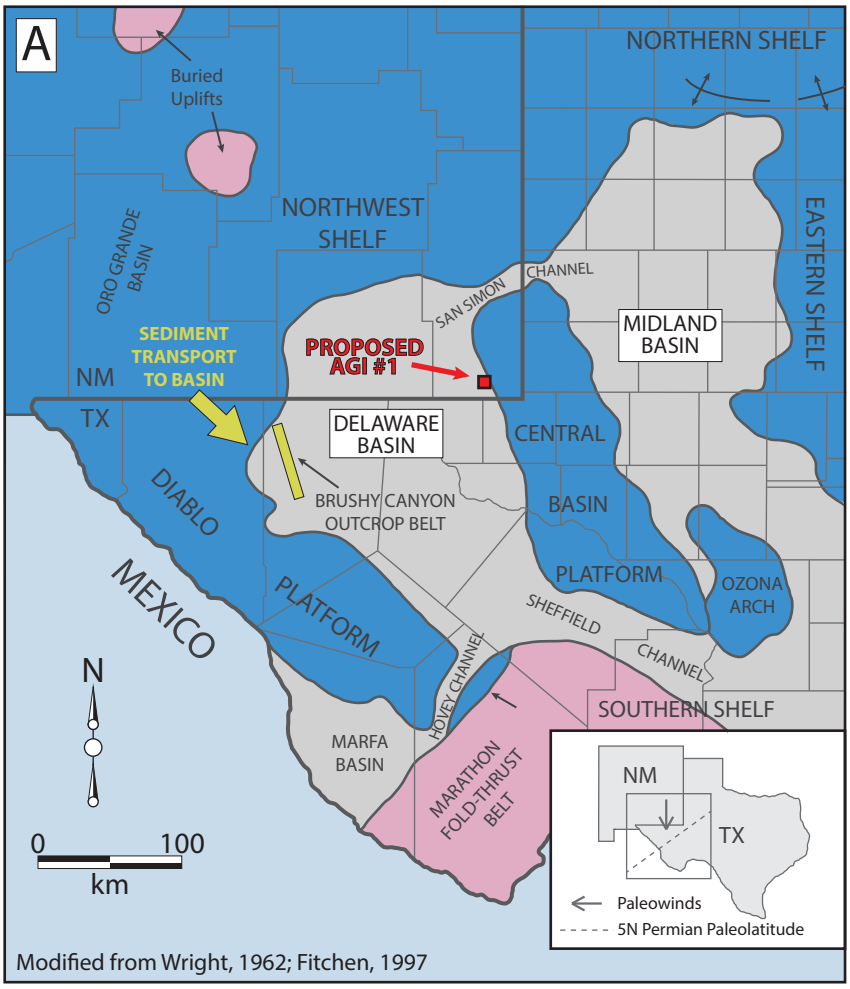


Figure 11. Mapped extent of present day overpressure in the Delaware Basin (Panel A) and example log response (Panel B) illustrating stratigraphic onset of over-pressured intervals and associated drilling fluid densities (modified from Rittenhouse et al., 2016).



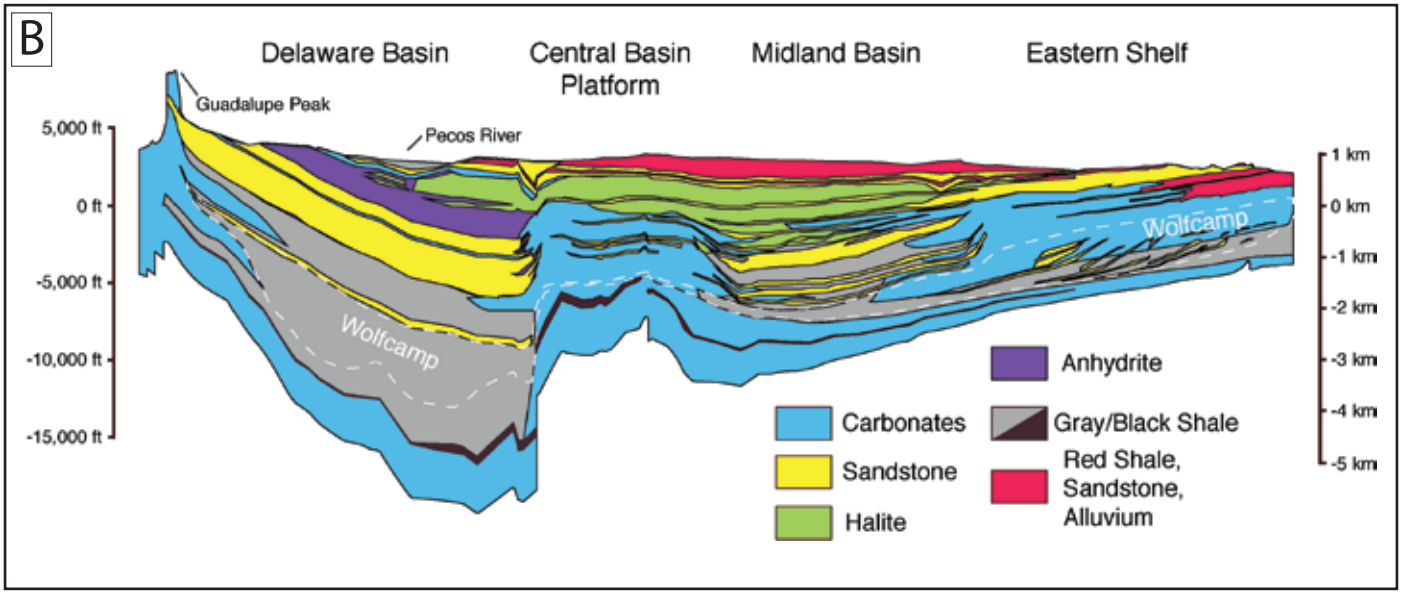


Figure 10. Structural setting (panel A) and general lithologies (panel B) of the Permian Basin

Generalized stratigraphic correlation chart for the Permian Basin region

SYSTEM	SERIES/ STAGE	NORTHWEST SHELF	CENTRAL BASIN PLATFORM	MIDLAND BASIN & EASTERN SHELF	DELAWARE BASIN	VAL VERDE BASIN
PERMIAN	OCHOAN	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO	DEWEY LAKE RUSTLER SALADO CASTILE	RUSTLER SALADO
	GUADALUPIAN	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES GLORIETA	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES GLORIETA	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES SAN ANGELO	★ DELAWARE MT. GROUP BELL CANYON CHERRY CANYON BRUSHY CANYON	TANSILL YATES SEVEN RIVERS QUEEN GRAYBURG SAN ANDRES
	LEONARDIAN	CLEARFORK YESO WICHITA ABO	CLEARFORK WICHITA	LEONARD SPRABERRY, DEAN	★ BONE SPRING	LEONARD
	WOLFCAMPIAN	WOLFCAMP	WOLFCAMP	WOLFCAMP	★ WOLFCAMP	WOLFCAMP
PENNSYLVANIAN	VIRGILIAN	CISCO	CISCO	CISCO	CISCO	CISCO
	MISSOURIAN	CANYON	CANYON	CANYON	CANYON	CANYON
	DESMOINESIAN	STRAWN	STRAWN	STRAWN	★ STRAWN	STRAWN
	ATOKAN	ATOKA	ATOKA	ATOKA	ATOKA	(ABSENT)
	MORROWAN	MORROW BEND	(ABSENT) BEND	(ABSENT ?) BEND	MORROW BEND	(ABSENT)
MISSISSIPPIAN	CHESTERIAN MERAMECIAN OSAGEAN KINDERHOOKIAN	CHESTER MERAMEC OSAGE KINDERHOOK	CHESTER MERAMEC OSAGE "BARNETT"	CHESTER MERAMEC OSAGE "BARNETT"	CHESTER MERAMEC OSAGE "BARNETT"	MERAMEC OSAGE "BARNETT"
			KINDERHOOK	KINDERHOOK	KINDERHOOK	KINDERHOOK
DEVONIAN		WOODFORD DEVONIAN	WOODFORD DEVONIAN	WOODFORD DEVONIAN	WOODFORD DEVONIAN	WOODFORD DEVONIAN
SILURIAN		SILURIAN (UNDIFFERENTIATED)	SILURIAN SHALE FUSSELMAN	SILURIAN SHALE FUSSELMAN	MIDDLE SILURIAN FUSSELMAN	MIDDLE SILURIAN FUSSELMAN
ORDOVICIAN	UPPER	MONTOYA	MONTOYA	SYLVAN MONTOYA	SYLVAN MONTOYA	SYLVAN MONTOYA
	MIDDLE	SIMPSON	SIMPSON	SIMPSON	SIMPSON	SIMPSON
	LOWER	ELLENBURGER	ELLENBURGER	ELLENBURGER	ELLENBURGER	ELLENBURGER
CAMBRIAN	UPPER	CAMBRIAN	CAMBRIAN	CAMBRIAN	CAMBRIAN	CAMBRIAN
PRECAMBRIAN						

Figure 13. General stratigraphy and producing zones (red stars) in the immediate area of Independence AGI #1 (modified from Yang and Dorobek, 1995)

AMEREDEV
Ameredev II, LLC

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

GEOLEX® INCORPORATED

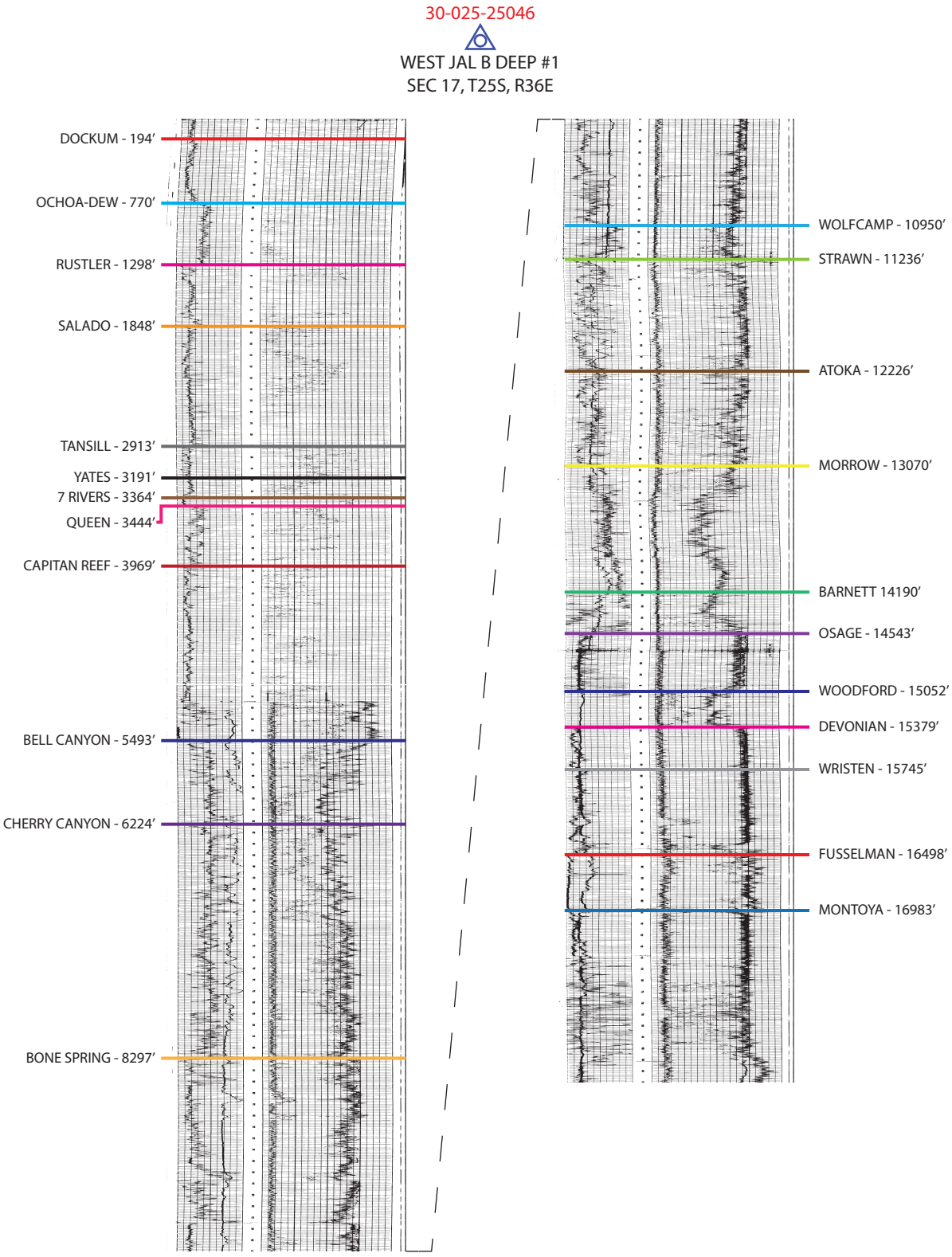


Figure /2. Type log of nearby well (API #30-028-25046) illustrating identified formation tops. Estimated formation tops for the proposed section 20 Ameredev AGI location are included in Table 6.

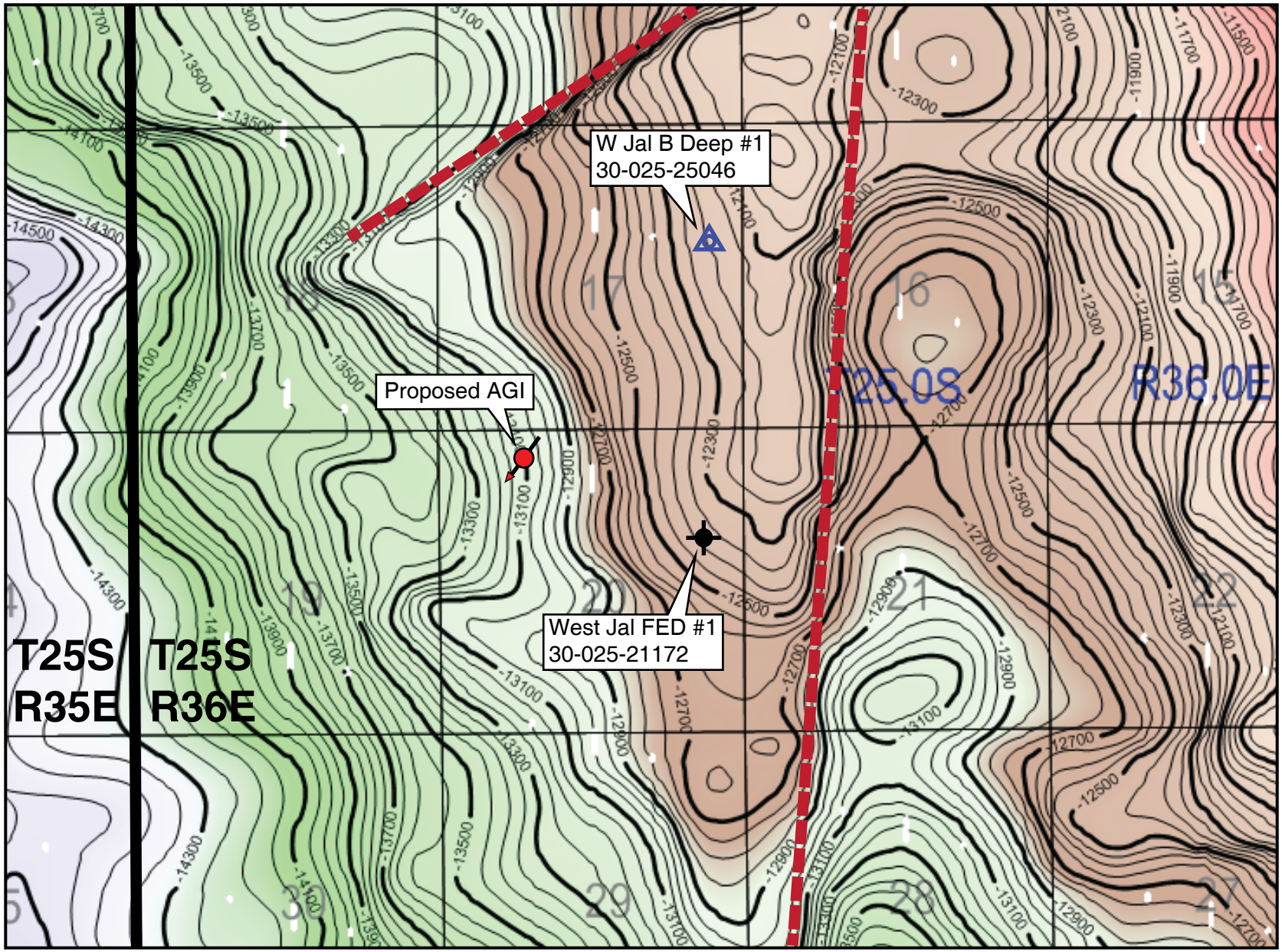


Figure 1p. Structure contour map showing the subsea elevations of the Siluro-Devonian target reservoir. Two faults identified in review of 3D seismic data are shown with red dashes

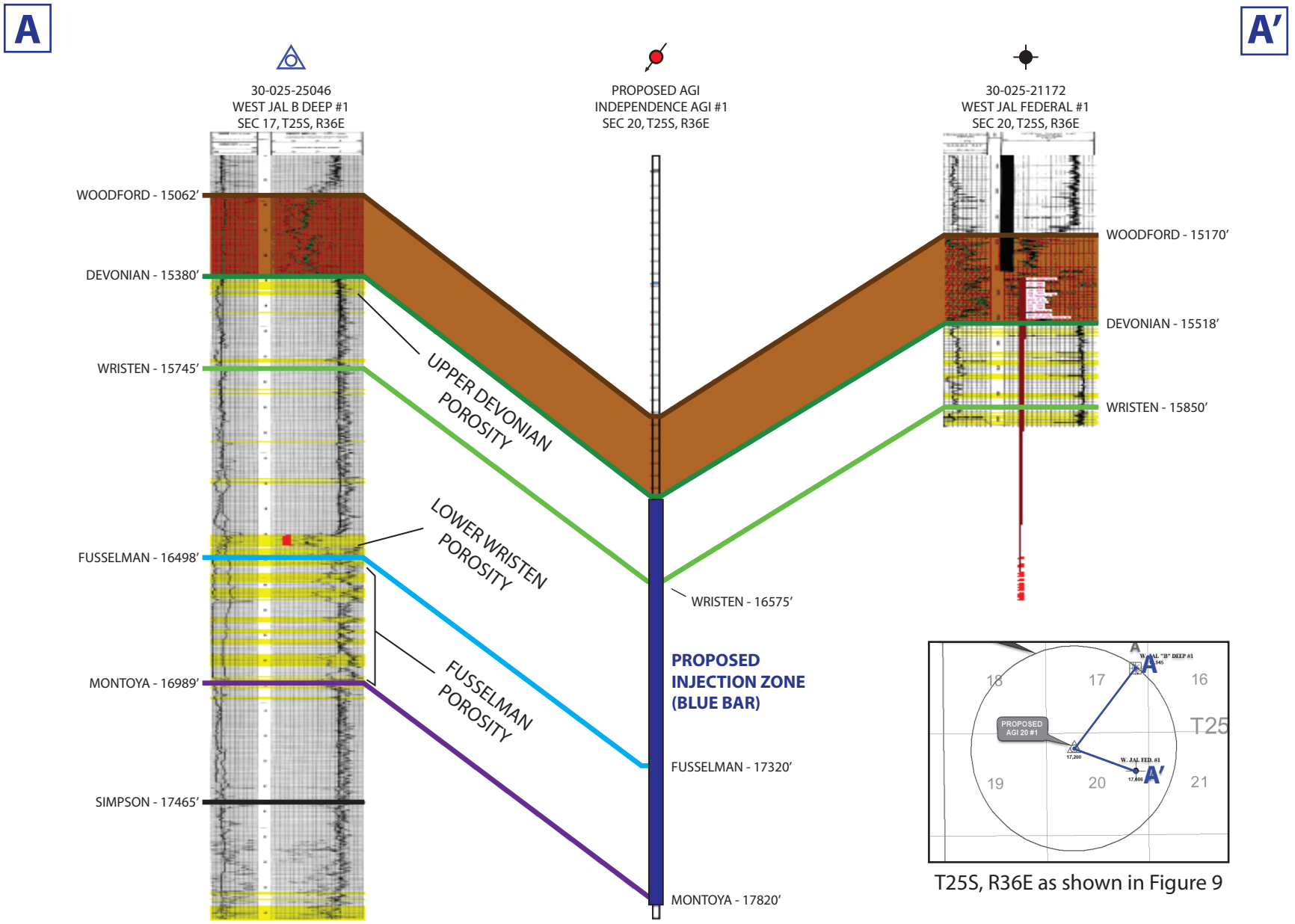


Figure 14. Structural cross section A - A' showing porosity profile from nearby offset wells penetrating the proposed injection interval and regional extent of overlying Woodford Shale caprock. Proposed injection zone from 16,230 feet to 17,900 feet (blue bar).

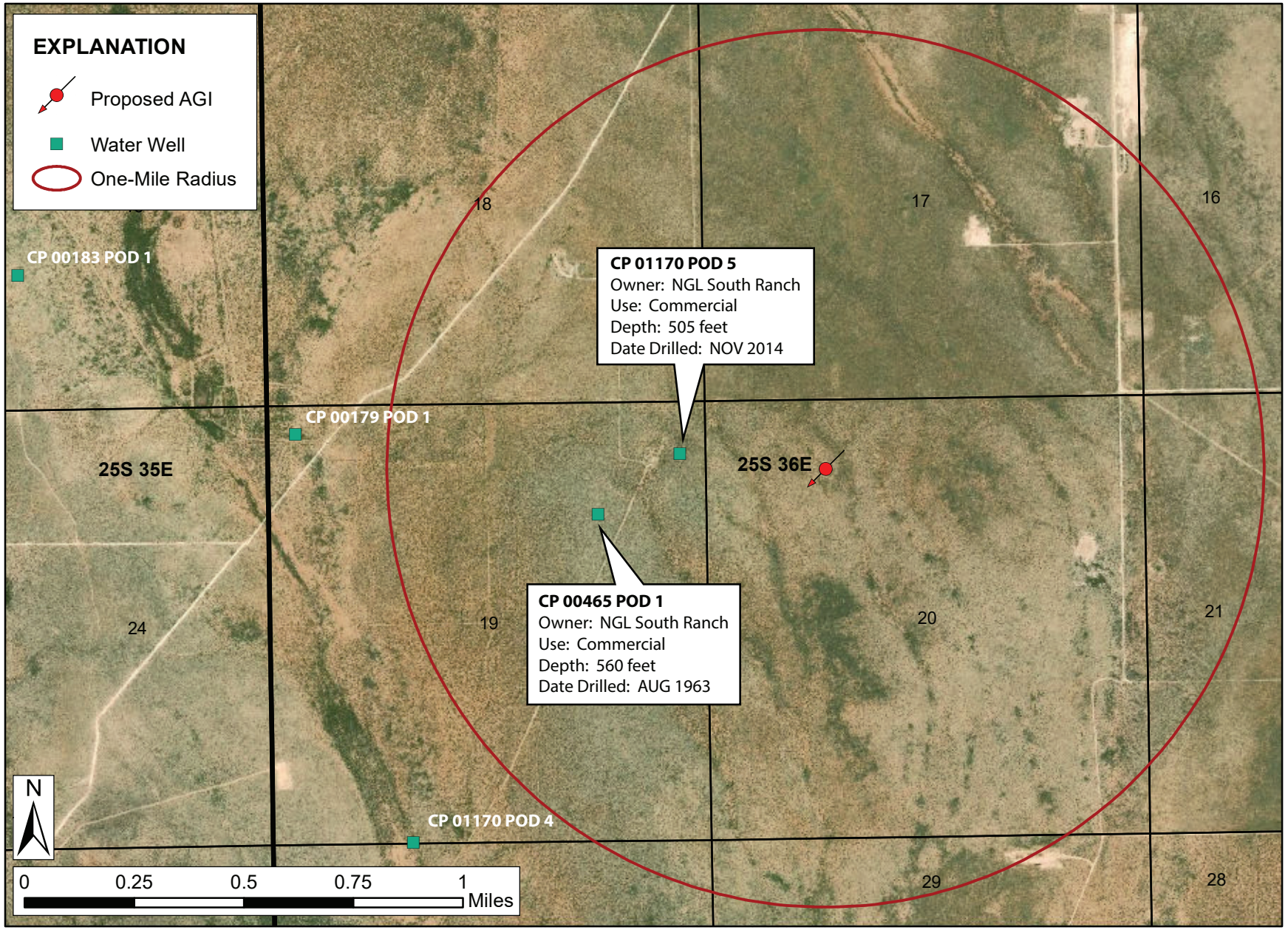


Figure 17. Water wells within one mile of the proposed Independence AGI #1

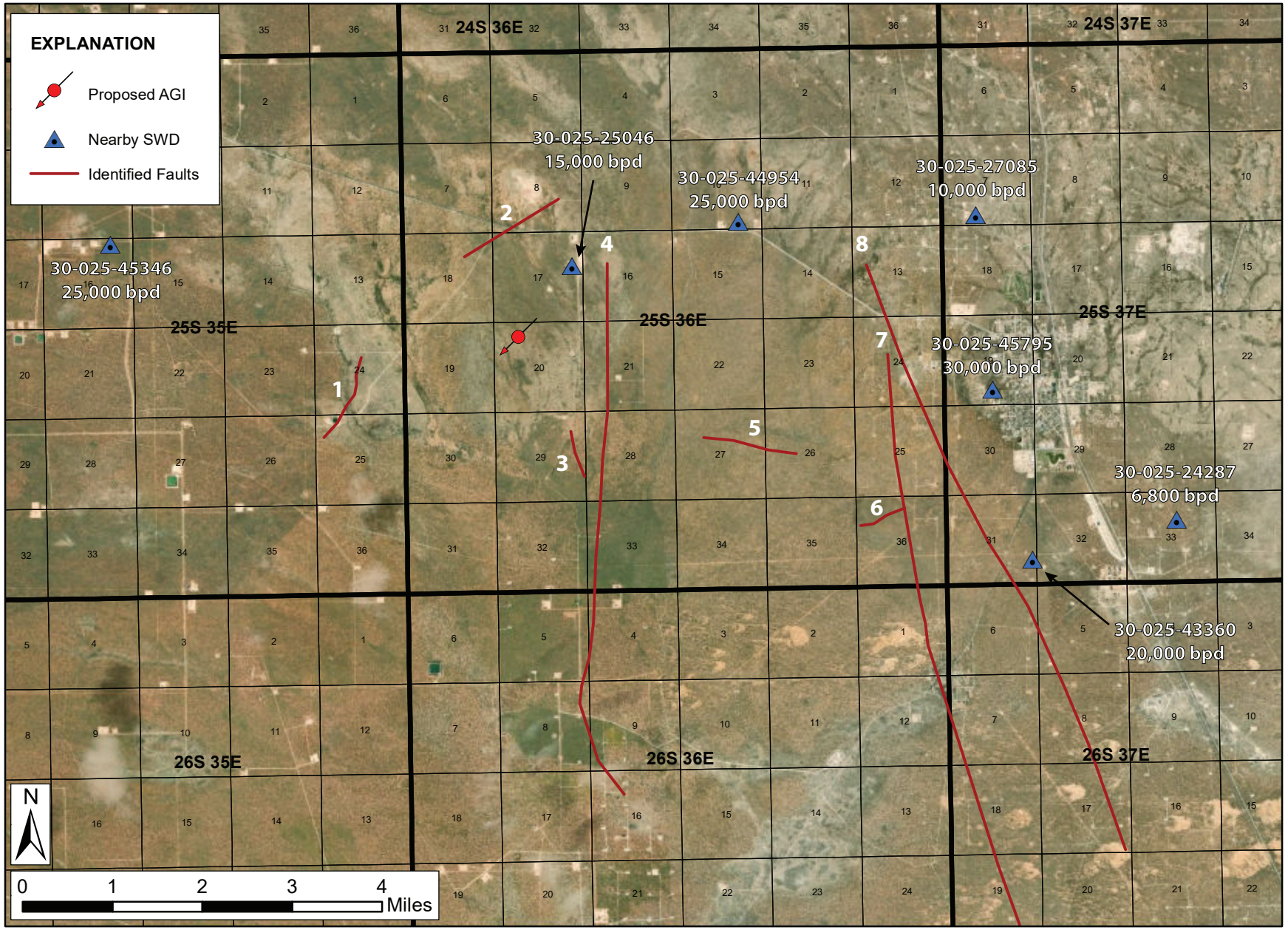
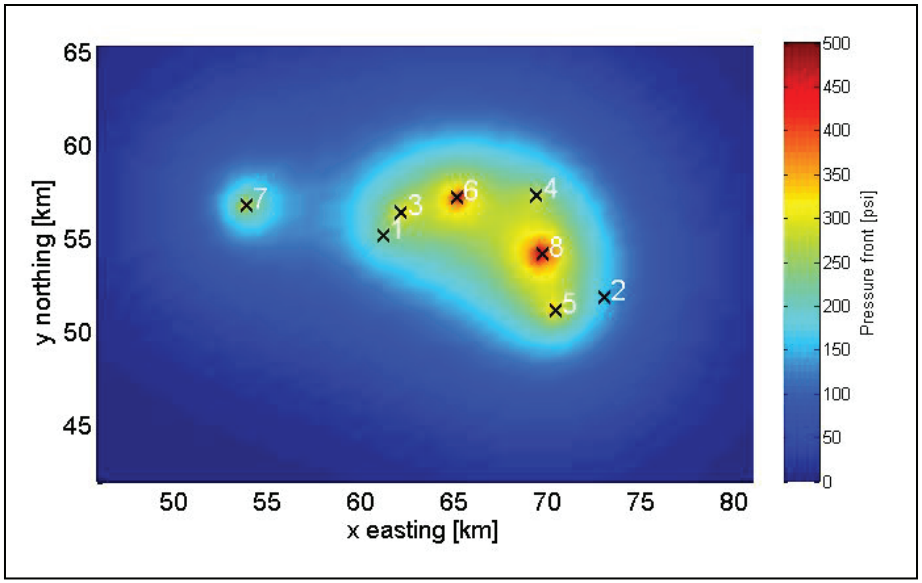
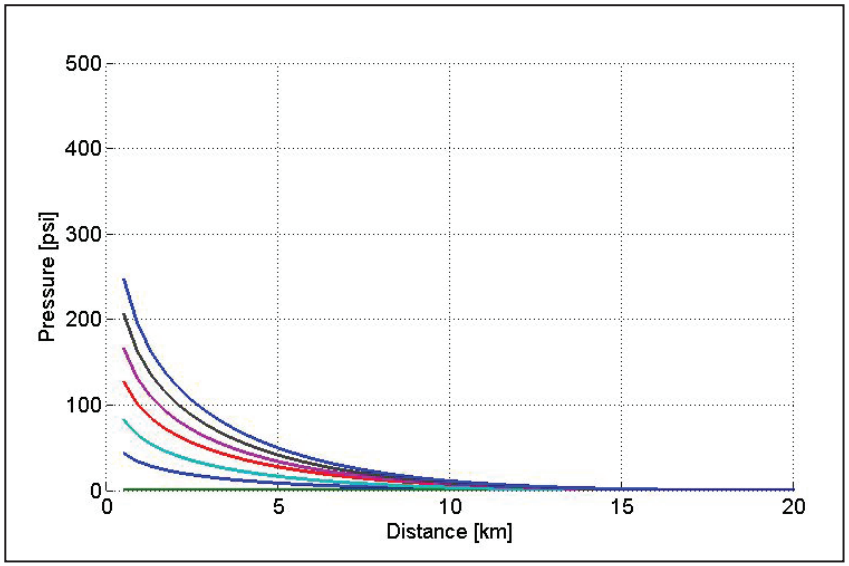


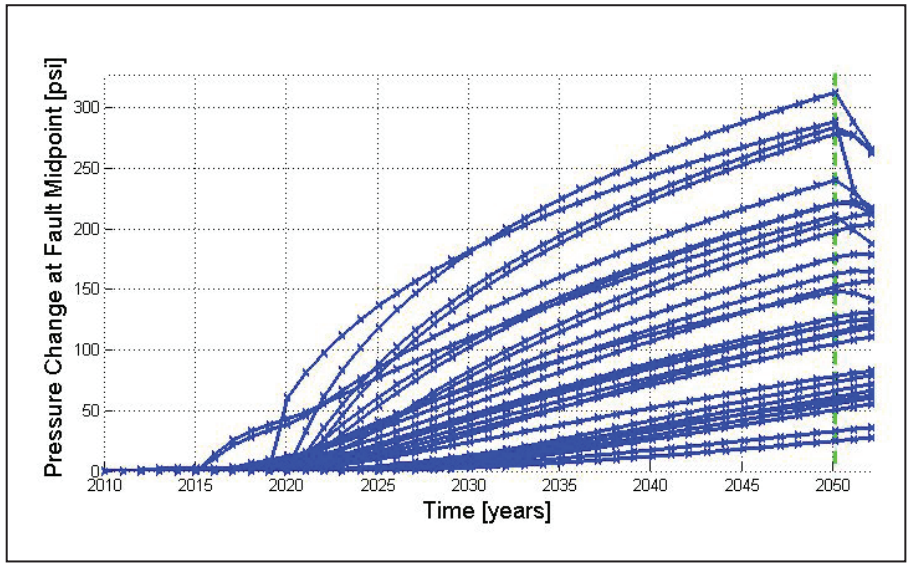
Figure 18. Siluro-Devonian injection wells and subsurface features in the vicinity of the proposed Independence AGI #1



Panel A. Resultant pressure front after 30 years of injection operations at the maximum anticipated injection rates, as reported in NMOCD records

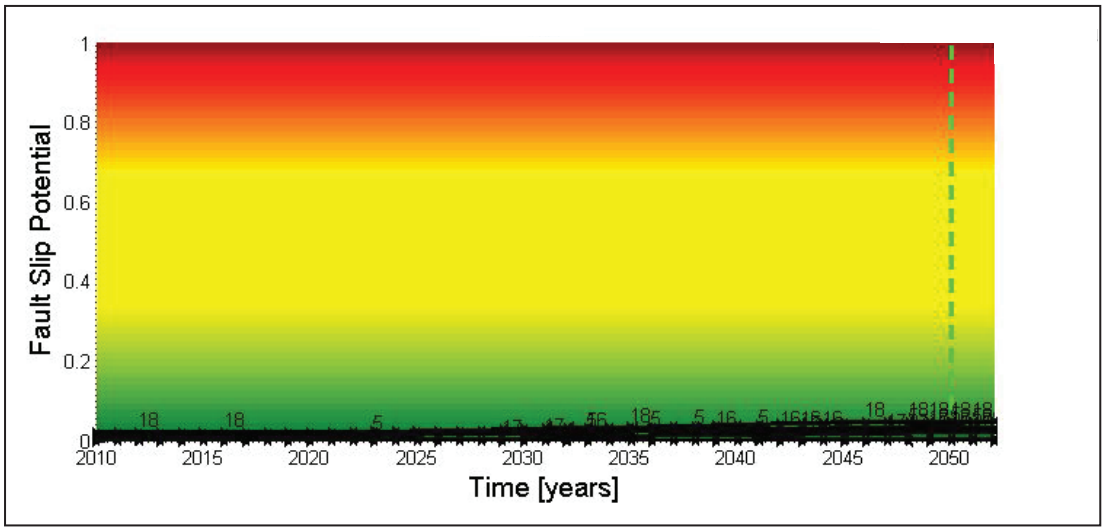


Panel B. Single well radial pressure solutions, as determined by the FSP model.

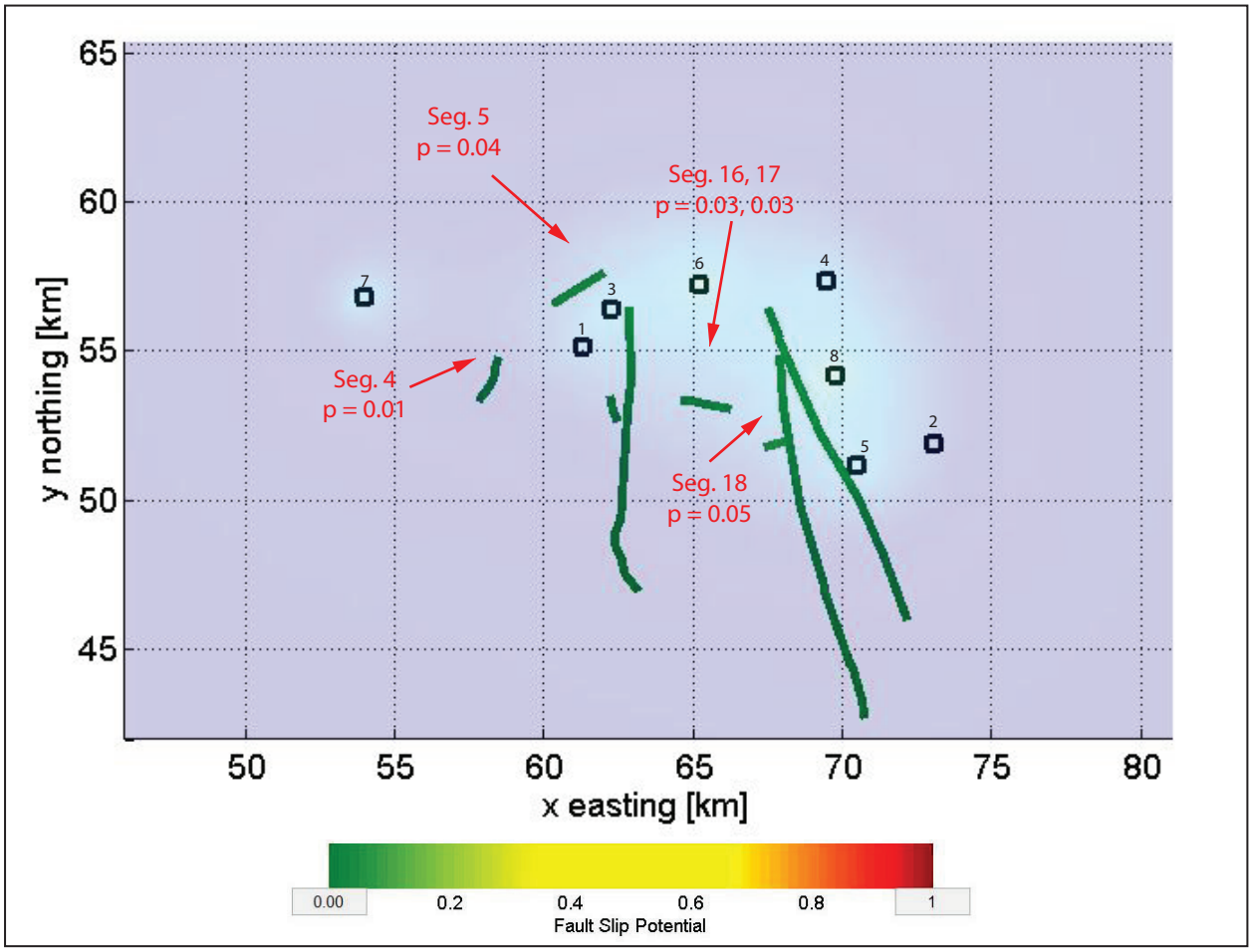


Panel C. Model-predicted pressure change through time at the midpoint of each fault segment included in the simulation

Figure 19. Summary of model-predicted pressure effects in response to the simulated eight-well injection scenario



Panel A. Fault-slip probability throughout the entire simulated injection period. FSP model results suggest no significant risk of injection-induced slip along any feature included in the simulation.



Panel B. Map view illustrating the model-estimated slip potential of faults at the end of the 40-year injection scenario. Any feature estimated to have a non-zero slip potential determination has been labeled on the above map.

Figure 20. Summary of model-determined fault-slip probabilities over the simulated injection period (2010-2050)

APPENDIX A

INFORMATION ON OIL AND GAS WELLS WITHIN TWO MILES AND ONE MILE OF THE PROPOSED INDEPENDENCE AGI #1 AND PLUGGING DATA FOR PLUGGED WELLS WITHIN ONE MILE OF THE PROPOSED AGI

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

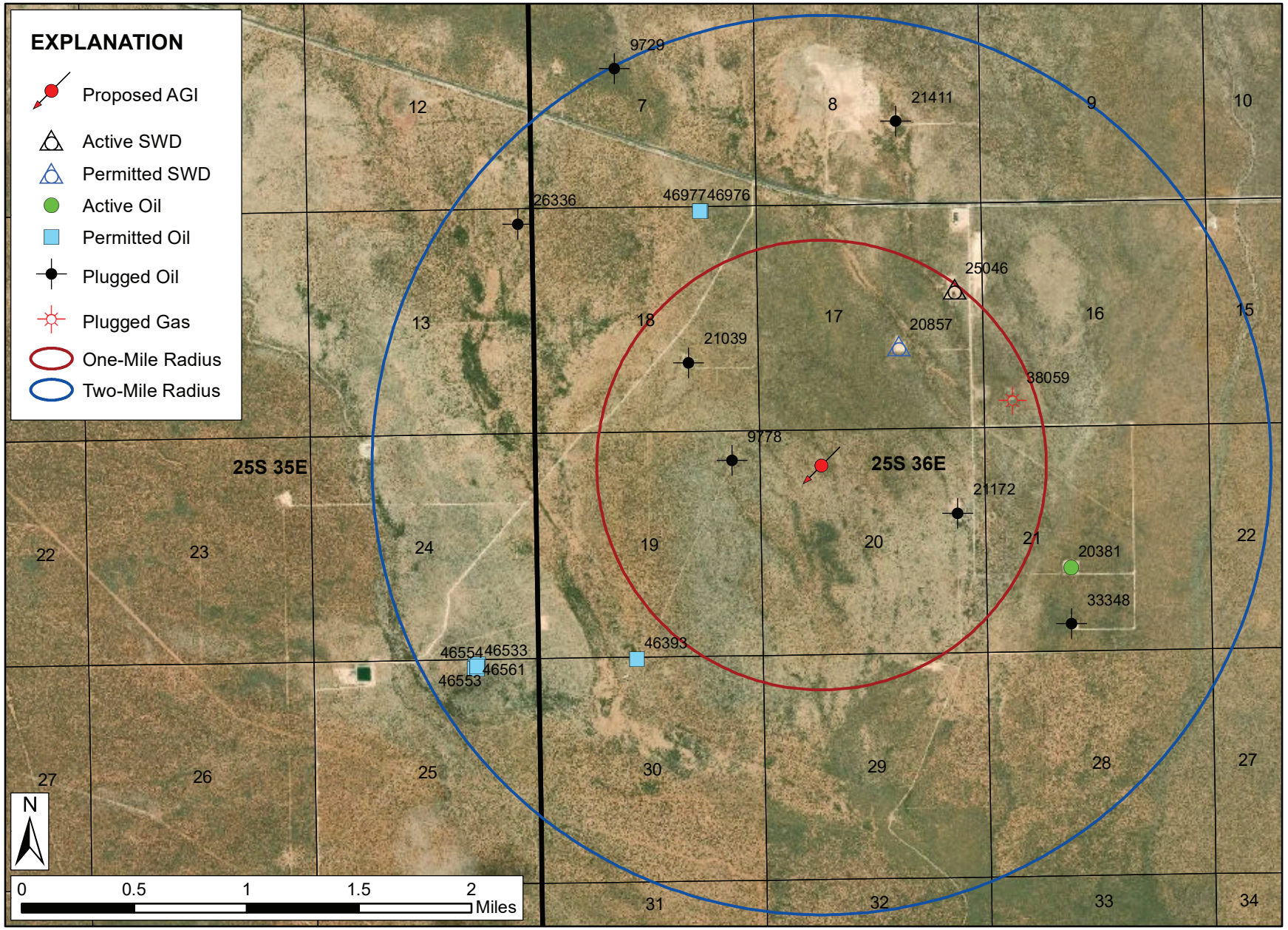


Figure A-1. All wells within two miles of the proposed Independence AGI #1. Labels denote last five digits of API #30-025-XXXXX.

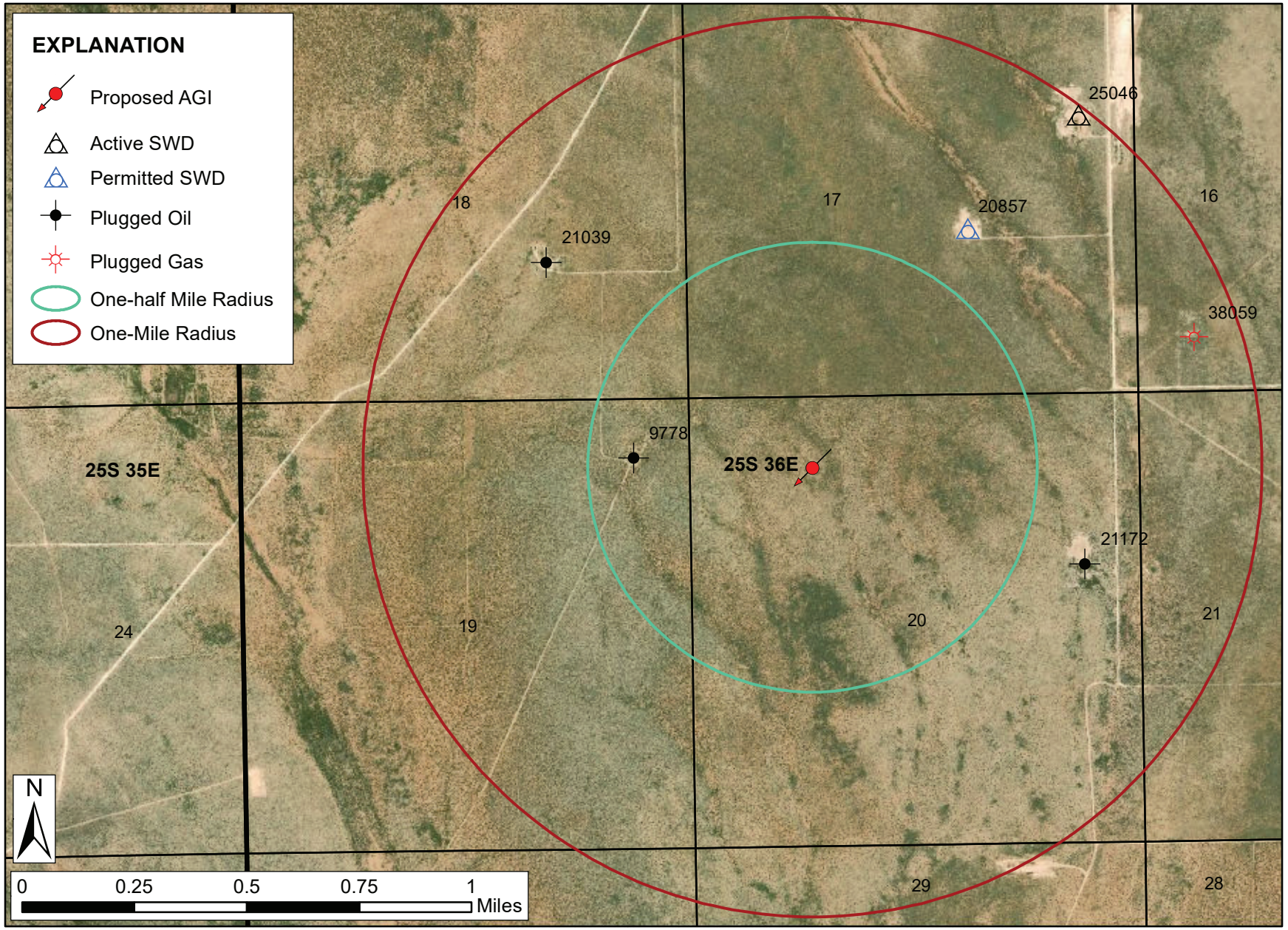


Figure A-2. All wells within one mile of the proposed Independence AGI #1. Labels denote last five digits of API #30-025-XXXXX.

TABLE A-1. WELLS LOCATED WITHIN TWO MILES OF THE PROPOSED AMEREDEV AGI #1

API	Well Name	Operator	Type	Status	LAT (NAD83)	LONG (NAD83)	Pool	Year Spud	Year Plug	TVD	Miles from AGI
3002509778	Federal #1	Edward C. Donohue	Oil	Plugged	32.1212425	-103.2978058	Wildcat	1959	1959	3891	0.4
3002521172	West Jal Unit #1	Texaco Exp.	Oil	Plugged	32.1175957	-103.2807388	Del, Strwn.	1972	1984	17086	0.64
3002520857	West Jal B #1	BC & D Operating	SWD	New	32.1284828	-103.2849808	Delaware	-	-	12275	0.67
3002521039	West Jal 18 #1	Skelly Oil Co.	Oil	Plugged	32.1276016	-103.3009949	Wildcat	1964	1964	12950	0.75
3002538059	Dinwiddie State COM #1	COG Oper.	Gas	Plugged	32.1248512	-103.2764587	Strawn	2006	2008	12192	0.9
3002525046	West Jal B Deep #1	BC & D Operating	SWD	Active	32.1320915	-103.2807083	Strwn-Fus.	-	-	18945	0.98
3002546393	Nandina 25 36 31 FED COM #124H	Ameredev Oper.	Oil	New	32.1084818	-103.3052491	Wolfcamp	-	-	0	1.19
3002520381	Herkimer BQF FED #1H	Ameredev Oper.	Oil	Active	32.1139870	-103.2722168	Delaware	-	-	8515	1.2
3002546977	Black Marlin FED #2	Impetro Oper.	Oil	New	32.1373440	-103.29986	Wolfcamp	-	-	0	1.27
3002546976	Black Marlin FED #1	Impetro Oper.	Oil	New	32.1373440	-103.299957	Wolfcamp	-	-	0	1.28
3002533348	Texaco West Jal 21 #1	Enserch Explor.	Oil	Plugged	32.1103592	-103.2722244	Dry Hole	1996	1998	7700	1.32
3002521411	C Elliott Federal #1	Texaco Exp.	Oil	Plugged	32.1429825	-103.2849579	Strawn	1965	1993	12276	1.57
3002526336	Federal 13 A #1	Getty Oil Co.	Oil	Plugged	32.1366997	-103.3137817	Wildcat	1979	1979	3686	1.72
3002546551	Sioux 25 36 State #9H	Caza Oper.	Oil	New	32.1083590	-103.3174820	B. Spring	-	-	0	1.77
3002546553	Sioux 25 36 State #12H	Caza Oper.	Oil	New	32.1083590	-103.3173200	B.Spring	-	-	0	1.77
3002546554	Sioux 25 36 State #13H	Caza Oper.	Oil	New	32.1080840	-103.3174010	U. Wolf.	-	-	0	1.78
3002546533	Sioux 25 36 State #8H	Caza Oper.	Oil	New	32.1081940	-103.3173997	U. Wolf.	-	-	0	1.78
3002546561	Sioux 25 36 State #10H	Caza Oper.	Oil	New	32.1080830	-103.3175620	U. Wolf.	-	-	0	1.79
3002509729	Pan Am Kelly 7 FED #1	John H. Trigg	Oil	Plugged	32.1466484	-103.3062668	Tansill	1959	1965	3540	1.99

TABLE A-2. WELLS LOCATED WITHIN ONE MILE OF THE PROPOSED AMEREDEV AGI #1

API	Well Name	Operator	Type	Status	LAT (NAD83)	LONG (NAD83)	Pool	Year Spud	Year Plug	TVD	Miles from AGI
3002509778	Federal #1	Edward C. Donohue	Oil	Plugged	32.1212425	-103.2978058	Wildcat	1959	1959	3891	0.4
3002521172	West Jal Unit #1	Texaco Exp.	Oil	Plugged	32.1175957	-103.2807388	Del, Strwn.	1972	1984	17086	0.64
3002520857	West Jal B #1	BC & D Operating	SWD	New	32.1284828	-103.2849808	Delaware	-	-	12275	0.67
3002521039	West Jal 18 #1	Skelly Oil Co.	Oil	Plugged	32.1276016	-103.3009949	Wildcat	1964	1964	12950	0.75
3002538059	Dinwiddie State COM #1	COG Oper.	Gas	Plugged	32.1248512	-103.2764587	Strawn	2006	2008	12192	0.9
3002525046	West Jal B Deep #1	BC & D Operating	SWD	Active	32.1320915	-103.2807083	Strwn-Fus.	-	-	18945	0.98

WEST JAL UNIT #1
(API 30-025-21172)

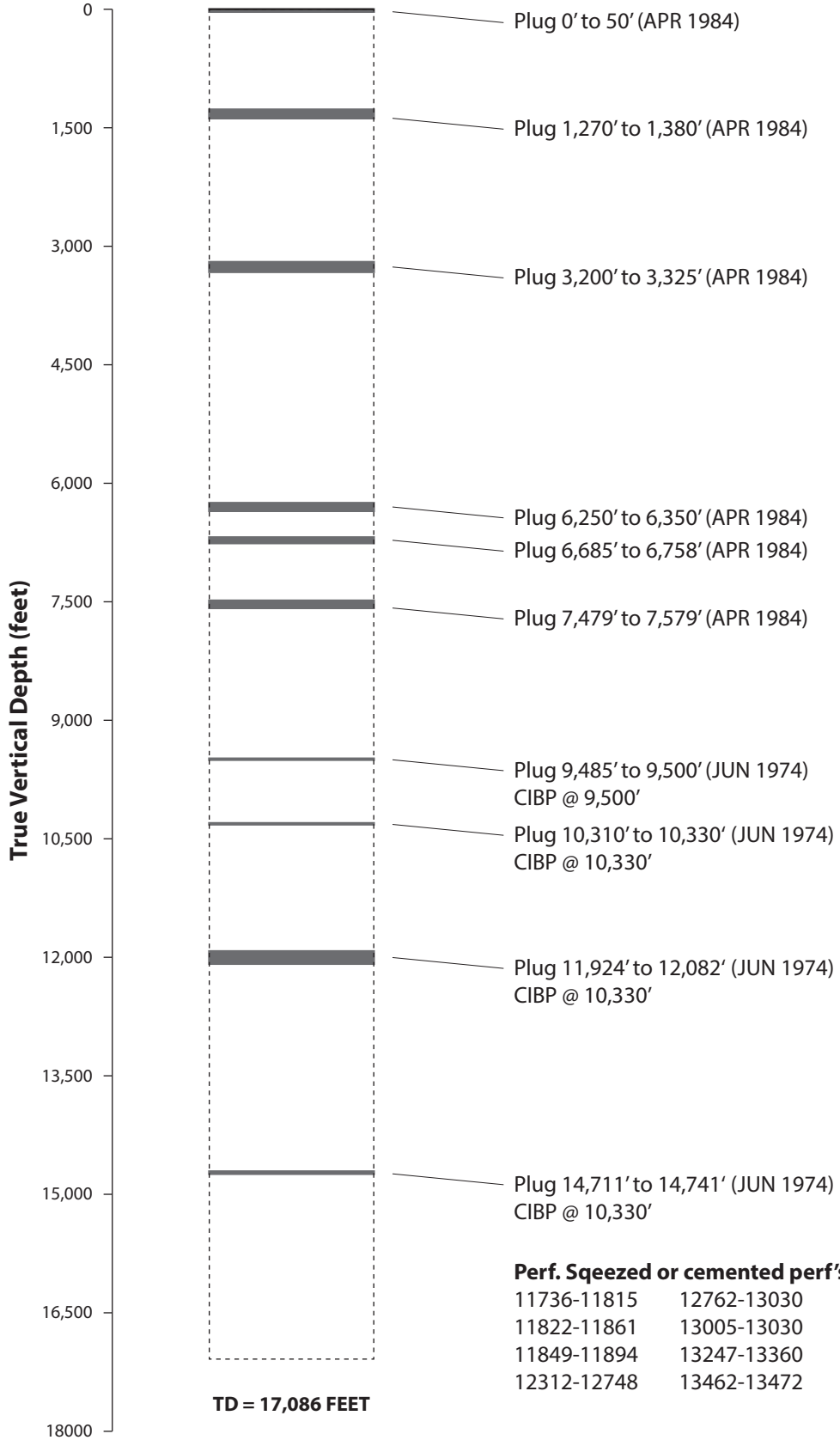
RELEVANT PLUGGING DOCUMENTS
(Retrieved from NMOCD records)

NOTE: Plugging diagram generated from description of plugging operations reported in available NMOCD records

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

TEXACO EXPLORATION AND PROD. - WEST JAL UNIT #1 PLUGGING DIAGRAM

Lease Name:	West Jal Unit #1	**Footage:**	1980 FNL and 660 FEL
API:	30-025-21172	**Well Type:**	Oil
Location:	Sec. 20, T25S, R36E	**Total Depth:**	17,086'
County, State:	Lea County, New Mexico	**Coordinates:**	32.117596, -103.280739 (NAD83)



Perf. Sqeezed or cemented perf's tested between:

11736-11815	12762-13030	13517-13524
11822-11861	13005-13030	13524-13532
11849-11894	13247-13360	15050-15353
12312-12748	13462-13472	16449-16614

*Schematic is not properly scaled

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

N. M. OIL CONS. COMMISSION
P. O. BOX 1980
HOBBS, NEW MEXICO 88240

C-31

orm 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.: NM 71792

6. If Indian, Allottee or Tribe Name:

7. If Unit or CA, Agreement Designation:

1. Type of Well: [X] Oil Well [ ] Gas Well [X] Other Reentry

8. Well Name and No.: West Jal Federal #1

2. Name of Operator: MCH Petroleum Services

9. API Well No.: 30-025-21172

3. Address and Telephone No.: 708 W. Pine St. Midland, Tx 79705 915 683 4772

10. Field and Pool, or Exploratory Area: W. Jal Delaware

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
1980' FNL 660' FEL Sec 20, T-25S, R-36E
H SENE Lea Co., NM

11. County or Parish, State: LEA, NM

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[X] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other Reentry	[ ] Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

MCH Petroleum Services proposes to reenter existing well originally drilled by Skelly Oil Company in 1961 and plug and abondoned by Texaco in 1983. MCH will drill out cement plugs and cibp @ 7,579' to a total depth of approx. 8,350' (inside casing). This will leave in place cibp at 9,500' and deeper. We will then test existing perforations @ 7,807'-7,857' and stimulate as necessary.
Mud Program: Fresh water will be used for the reentry inside casing.
BOP Program: BOP will be installed at the beginning and tested daily.

APPROVAL SUBJECT TO
GENERAL REQUIREMENTS AND
SPECIAL STIPULATIONS
ATTACHED

14. I hereby certify that the foregoing is true and correct
Signed Mary Huber Title Owner Date 4/13/93

(This space for Federal or State office use)
Approved by /ORIG. SGD.) RICHARD L. MANUS Title AREA MANAGER Date JUN 4 1993
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

Exhibit No. 6
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Form 3160-3
(December 1990)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0136
Expires: December 31, 1991

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR DEEPEN

5. LEASE DESIGNATION AND SERIAL NO.: NM 71792

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

1a. TYPE OF WORK: DRILL ☐ DEEPEN ☐

b. TYPE OF WELL: OIL WELL ☒ GAS WELL ☐ OTHER Reentry SINGLE ZONE ☒ MULTIPLE ZONE ☐

8. FARM OR LEASE NAME, WELL NO.: West Jal Federal #1

2. NAME OF OPERATOR: MCH Petroleum Services

9. API WELL NO.: 30-025-21172

3. ADDRESS AND TELEPHONE NO.: 708 W. Pine St. Midland, Tx 79705 915 683 4772

10. FIELD AND POOL, OR WILDCAT: [redacted] W. Jal Delaware

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 1980' FNL, 660' FEL Sec 20 T-25S, R-36E Lea Co. NM
At proposed prod. zone: Same H SENE

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: S-20, T-25S, R-36E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 6 miles W. Jal, N.M.

12. COUNTY OR PARISH: Lea | 13. STATE: NM

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any): 660'

16. NO. OF ACRES IN LEASE: 600

17. NO. OF ACRES ASSIGNED TO THIS WELL: 40

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.:

19. PROPOSED DEPTH: 8350

20. ROTARY OR CABLE TOOLS: Pulling unit / Reverse unit

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3076' GL

22. APPROX. DATE WORK WILL START: ASAP (Prior to 6/1/93 exp.)

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	GRADE, SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
26	20		869' (In Place)	1630 sx.
17 1/2	13 3/8	72, 68, 64	6300' (In Place)	3606 sx.
12 1/4	9 5/8	53.5, 47, 43.5	11,736 (In Place)	775 sx.
8 3/8	7	26	6735-12213 (Shot off @ 6735)	612 sx
6 1/4	5 1/2 (LNR.)	(unk.)	12,032-15,400	450 sx.
(unk)	3 1/2 (LNR.)	(unk.)	14,967-17,084	250 sx.

MCH Petroleum Services proposes to reenter existing well originally drilled by Skelly Oil Company in 1961 and plug and abondoned by Texaco in 1983. MCH will drill out cement plugs and cibp @ 7,579' to a total depth of approx. 8,350'(inside casing). This will leave in place cibp at 9,500' and deeper. We will then test existing perforations @ 7,807'-7,857' and stimulate as necessary.

Mud Program: Fresh water will be used for the reentry inside casing.

BOP Program: BOP will be installed at the beginning and tested daily.

APPROVAL SUBJECT TO GENERAL REQUIREMENTS AND SPECIAL STIPULATIONS ATTACHED

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED Craig Huber TITLE Owner DATE 4/13/93

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

CONDITIONS OF APPROVAL, IF ANY:

APPROVED BY _____ TITLE _____ DATE _____

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Form 3160-5
(November 1983)
(Formerly 9-331)

Form approved.
Budget Bureau No. 1004-0135
Expires August 31, 1985

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

P.O. BOX 1980
HOBBS, NEW MEXICO 88240

5. LEASE DESIGNATION AND SERIAL NO.
NM-03429A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL [X] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME
West Jal Unit

2. NAME OF OPERATOR
Getty Oil Company

8. FARM OR LEASE NAME

3. ADDRESS OF OPERATOR
P.O. Box 730, Hobbs, NM 88240

9. WELL NO.
1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
Unit Ltr. H, 1980' FNL & 660' FEL

10. FIELD AND POOL, OR WILDCAT
West Jal Delaware

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20, T-25S, R-36E

BUREAU OF LAND MGMT. APR 7 DIST. 6 N. M. ROSWELL, NEW MEXICO

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3138' D.F.

12. COUNTY OR PARISH
Lea

13. STATE
NM

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	XX
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

3/26/84 Rigged up. Pulled rods and pump. Unseat tbg. anchor and install BOP.

3/28/84 Pulled 2 7/8" buttress & 2 3/8" tbg. anchor. Ran 7" CI plug, set @ 7579'. Ran 2 3/8" to 4290'. By Halliburton, circ. 191 bbls. gel brine, pulled tbg. Perfs 4-0.25" holes @ 6400'. Circ. out 7" between 9 5/8". Ran 2 7/8" to 7554'.

3/29/84 Rigged up csg. puller unit. Pulled tbg. Remove BOP & 7" tbg. spool.

3/30/84 Weld 7" pull nipple. Cut 7" csg. @ 6735'. Pulled 11 jts 7", 26#, P-110 csg. 8 rd.

3/31/84 Layed down total 163 jts (est. 6525') 7", 8rd casing. Nipple down 9 5/8" head.

4/2/84 Weld on 9 5/8" pulled nipple. Attempted to pull slips with 500,000#. Set off primer cord around head, no movement. Left soaking in penetrating oil.

4/3/84 Dug out 13 3/8" csg. unflange head. Move pipe 1" with 600,000#. Cut off. Pulled nipple, installed BOP. Ran tbg to 5216'.

4/4/84 Spot 20 sxs cement on top of CIBP 7579-7479'. Spot 100' plug (45 sxs) at 6758-6685', 6350-6250', 3325-3200', 1380-1270'. Remove csg. head.

4/5/84 Rigged down. Installed 20 sxs. Plugged 0-50'. Installed dry hole marker. P&A.

18. I hereby certify that the foregoing is true and correct

SIGNED Donald J. Steinmetz TITLE Area Superintendent DATE April 11, 1984

~~for Dale R. Crockett~~
(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE 6887

CONDITIONS OF APPROVAL, IF ANY:

0+6-BLM-Roswell 1-Mr. J.A.-Midland
1-File 1-Laura Richardson-Midland
1-Engr Jim 1-BB, 1-JA
1-Foreman CK 1-SH, 1-CP 1-Southland Royalty Company, 1-ARCO

Approved as to plugging of the well bore. Liability under bond is retained until surface restoration is completed.

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

N. M. OIL CONS. COMMISSION
P. O. BOX 1980
HOBBS, NEW MEXICO 88240

O+6 - BLM - P.O. Box 1857, Roswell, 1-File, 1-Engr.JIM, 1-Foreman CK

Form 9-331 Dec. 1973

1 - Laura Richardson-Midland

Form Approved.
Budget Bureau No. 42-R1424

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

BUREAU OF LAND MANAGEMENT RECEIVED JUL 25 1983 ROSWELL, NEW MEXICO DIST. 6 N. M.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil well XX gas well ☐ other

2. NAME OF OPERATOR
Getty Oil Company

3. ADDRESS OF OPERATOR
P.O. Box 730 Hobbs, NM 88240

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)
AT SURFACE: Unit ltr. H, 1980' FNL & 660 FEL
AT TOP PROD. INTERVAL:
AT TOTAL DEPTH:

5. LEASE
NM-03429A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME
West Jal Unit

9. WELL NO.
1

10. FIELD OR WILDCAT NAME
West Jal Delaware

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20, 25S-36E

12. COUNTY OR PARISH
Lea

13. STATE
NM

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)
3138' D.F.

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:		SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF	☐	☐
FRACTURE TREAT	☐	☐
SHOOT OR ACIDIZE	☐	☐
REPAIR WELL	☐	☐
PULL OR ALTER CASING	☐	☐
MULTIPLE COMPLETE	☐	☐
CHANGE ZONES	☐	☐
ABANDON*	XX	☐
(other) Revised		

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Revised procedure as per conversation with Mr. Peter Chester 7/18/83:

1. Install B.O.P.
2. Set C.I.B.P. at +7860 w/35' cement on top.
3. Perforate 2 holes @ 6375' & squeeze with sufficient cement to bring cement to 6225'.
4. Set cement plug 1230-1330' top of salt. (in & behind casing).
5. Set 50' surface plug.
6. Install dry hole marker.
7. Restore location.

Subsurface Safety Valve: Manu. and Type _____ Set @ _____ Ft.

18. I hereby certify that the foregoing is true and correct

SIGNED ~~Dale R. Crockett~~ TITLE Area Superintendent DATE July 22, 1983

APPROVED

(This space for Federal or State office use)

(Orig. Sgd.) M. CHESTER
APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

SEP 14 1983

JLH

*See Instructions on Reverse Side

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

62

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] Other

b. TYPE OF COMPLETION: NEW WELL [ ] WORK OVER [ ] DEEP-EN [ ] PLUG BACK [X] DIFF. RESVR. [X] Other

2. NAME OF OPERATOR: Shelly Oil Company

3. ADDRESS OF OPERATOR: P. O. Box 1351, Midland, Texas 79701

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: Unit Letter H, 1880' FNL and 660' FEL, Sec. 20-25S-36E
At top prod. interval reported below
At total depth

5. LEASE DESIGNATION AND SERIAL NO.: NM-03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: - - - - - -

7. UNIT AGREEMENT NAME: - - - - - -

8. FARM OR LEASE NAME: West Jal Unit

9. WELL NO.: 1

10. FIELD AND POOL, OR WILDCAT: Jal Delaware, West UNDESIGNATED

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 20-25S-36E

14. PERMIT NO. | DATE ISSUED

12. COUNTY OR PARISH: Lea | 13. STATE: New Mexico

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (*Ready to prod.*)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
- -	- -	5-26-74	3138' DF	- - -

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
17086'	9485' PBTD	- -	→	- -	- -

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 7807-7857' Delaware

25. WAS DIRECTIONAL SURVEY MADE: - - -

26. TYPE ELECTRIC AND OTHER LOGS RUN: None

27. WAS WELL CORED: - -

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
No Change					

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
-	-	-	-	-
-	-	-	-	-

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2-3/8" OD	7941'	- -
2-7/8" OD		- -

31. PERFORATION RECORD (*Interval, size and number*)
7807-7811', 7816-7818', 7853-7857', total 32 shots, 0.50" diameter, two shots per foot.

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7807-7857'	750 gallons mud acid 5000 gallons 15% NE acid, 82 ball sealers, 90000# 20-40 sand, 9000 gallons loose oil

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or*)
5-28-74	Pumping	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
6-19-74	24	*		63	1	6	16

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
- -	68#		63	1	6	41*

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Used for Fuel — TEST WITNESSED BY

35. LIST OF ATTACHMENTS: None

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED (Signed) D. R. Crow D. R. Crow TITLE Lead Clerk DATE 6-20-74

*(See Instructions and Spaces for Additional Data on Reverse Side)

INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency, or both, pursuant to applicable Federal and/or State laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachments should be listed on this form, see item 35.

Item 4: If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: *"Sacks Cement":* Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

37. SUMMARY OF POROUS ZONES:
SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES

FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.
			1) Squeezed Pseudman perfs. 16,449-16,614' with 100 sacks Class "H" cement, 5/10% CFR-2. 2) Spotted 25 sacks cement 14,711-14,741', 25 sacks 11,924-12,082' and set cast iron bridge plug at 10,330' and spotted 4 sacks cement 10,310-10,330'. 3) Perforated 7" OD casing in First Bone Springs formation with two 0.48 diameter holes per foot at 10,112-10,122' and 10,128-10,132'. (28 shots total) 4) Treated First Bone Springs perfs. 10,112-10,132 with 5500 gallons acid and 68 ball sealers. 5) Swab tested First Bone Springs perfs. 10,112-10,132' May 14, 1974, to May 21, 1974, for no oil, 14 bbls. water and slight show of gas in 5 hours. 6) Set cast iron bridge plug at 9500' and cemented with 3 sacks cement plugging back to 9485'. 7) Perforated 7" OD casing in Delaware formation with two 0.50" diameter holes per foot at 7807-7811', 7816-7824' and 7853-7857'. (32 shots total) 8) Treated Delaware perfs. 7807-7857' with 750 gallons mud acid, 5000 gallons 15% NE acid, 9000 gallons gelled lease oil, 9000# 20-40 sand and 22 ball sealers. 9) Returned well to production status 5-28-74 pumping Delaware perfs. 7807-7857' for 63 bbls. oil, 6 bbls. water and 1 MCFGPD.

38. GEOLOGIC MARKERS

NAME	TOP MEAS. DEPTH	TOP TRUE VERT. DEPTH

U.S. GOVERNMENT PRINTING OFFICE: 1963—O-683636

871-233

8) Flowed 24-1/2 hours through 1" choke, making no oil, 45 bbls. load water, 393 bbls. formation water and gas at rate of 266 MCF per day. FTP 200#, CP 2300#.
9) Ran flow meter, Gradionometer and Temperature Survey to determine water entry.
10) Shut well in seven hours, then ran Base Temperature Log 16,000-17,020'. Water channelling from bottom of well bore to 16,508'.
11) Set cement retainer at 16,250' and squeezed perfs. 16,499-16,614' with 150 sacks Class "H" cement containing 4/10ths of 1% CFR-2 and 1% Halad 9. Squeeze failed. WOC 4 hours.
12) Resqueezed perfs. 16,449-16,614' with 50 sacks Class "H" cement with 1% Halad 9, 4/10ths of 1% CFR-2 and 1/4# Flocele per sack and 150 sacks Class "H" containing 1% Halad 9 and 4/10ths of 1% CFR-2. Squeeze failed.
13) Attempted to pull cement retainer - stuck.
14) Milled and pushed cement retainer from 16,250' to 16,490'. Recovered cement retainer.
15) Drilled and pushed junk to 16,930'.
16) Ran 254 jts. (14,793') of 2-7/8" OD tubing and set packer at 14,810'. Swabbed 9 hours, recovering 60 bbls. load water with good show of gas.
17) Treated perfs. 16,449-16,614' with 500 gals. 15% NE acid with 2 ball sealers. Swabbed 7 hours, recovering 1 bbl. load water, flowing gas at rate of 50 MCF per day.
18) Treated perfs. 16,449-16,614' with 5000 gals. 15% NE acid and 27 ball sealers.
19) Ran Temperature Survey 15,000-16,958'.
20) Tested well. Well flowed at rate of 910 MCF per day on 23/64" choke, no oil, FTP 310#. Pulled tubing and packer.
21) Reran 457 jts. (14,940') of 2-7/8" OD 7.9# DSS-HT Atlas-Bradford Condition "A" tubing and set at 14,967'.
22) Circulated hole with corrosion inhibitor water. Released rig 11-8-72. Flowed and tested well.
23) On Dec. 11, 1972, treated perfs 16,449-16,614' with 12,500 gals. of 1% KCL water with 62# friction reducer, 25 gals. Adofoam and 25 gals. scale inhibitor, 20,000 gals. 20% retarded acid with 100# friction reducer, 40 gals. Adofoam, 160 gals. acid inhibitor, 1000# fluid loss agent and 40 gals. scale inhibitor and 7 ball sealers. All fluid contained 400 S.C.F Nitrogen per barrel.
24) Testing well.

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions re-verse side)

Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

2. NAME OF OPERATOR
Skelly Oil Company

3. ADDRESS OF OPERATOR
P. O. Box 1351, Midland, TExas 79701

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface
1980' FNL and 660' FEL Sec. 20-25S-36E

5. LEASE DESIGNATION AND SERIAL NO.
NM-03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME
---

7. UNIT AGREEMENT NAME
---

8. FARM OR LEASE NAME
West Jal Unit

9. WELL NO.
1

10. FIELD AND POOL, OR WILDCAT
Undesignated Fusselman

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 20-25S-36E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3076' GR

12. COUNTY OR PARISH
Lea

13. STATE
New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) **Clean out & deepen to 17,086'**			☒
(Other)			☐	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

1) Rigged up rotary tools 7-28-72. Pulled tubing and packer.
2) Set cement retainer at 11,390' and squeezed Strawn 7" OD casing perfs. 11,510-11,741' with 100 sacks Class "H" cement containing 1% CFR-2 and 3# sand per sack. Squeeze failed. WOC 4 hours.
3) Resqueezed perfs. 11,510-11,741' with 100 sacks Class "H" cement containing 5/10% of 1% CFR-2 and 3# sand per sack. Squeezed at 6500#. Reversed out 15 sacks.
4) After WOC 12 hours, drilled cement retainer at 11,390' and cement 11,390-11,755' with 6-1/2" bit.
5) Tested squeeze job to 3000#; held okay.
6) Drilled cement 11,790-11,832' and tested old squeeze job on perfs. 11,736-11,815' to 3000#; held okay.
7) Drilled cement 11,832-11,844'; pushed plus-plug to 11,976'. Drilled plug. Tagged junk at 12,002' and pushed to 12,312'.
8) Cleaned to top of 5-1/2" OD liner at 12,032', set cement retainer at 11,820' and found casing perfs. 11,849-11,894' open.
9) Squeezed 5-1/2" casing perfs. 11,849-11,894' with 50 sacks Class "H" with 1% CFR-2 and 100 sacks Class "H" with 1% CFR-2 and 3# sand per sack.
10) Dumped 20 sacks cement on retainer at 11,820', plugging back to 11,717'. Reversed out 90 sacks cement. WOC 12 hours.

(continued on page 2)

18. I hereby certify that the foregoing is true and correct

SIGNED _____ TITLE **Lead Clerk** DATE **Dec. 18, 1972**

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

ACCEPTED FOR RECORD
DEC 20 1972
U. S. GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

*See Instructions on Reverse Side

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

11) Drilled cement 11,708-11,820'; cement retainer 11,820-11,822' and cement 11,822-11,861'. Cleaned out to top of liner at 12,032'.
12) Tested squeeze job to 2500#; held okay.
13) Drilled junk 12,312-12,748.5'; cement 12,748.5-12,760'; junk to 12,762'; cement 12,762-13,030'.
14) Tested old squeezed perfs. 13,005-13,030' to 2500#; held okay.
15) Milled and drilled cast iron bridge plug at 13,174' and pushed to 13,395'.
16) Tested 5-1/2" OD liner perfs. 13,247-13,360' to 2900#; could not pump into perfs.
17) Milled cast iron bridge plug 13,396-13,400'.
18) Tested perfs. 13,462-13,472' to 2700#; could not pump into perfs.
19) Milled and drilled out cement retainer 13,517-13,524'; cement 13,524-13,532'; cement 15,050-15,353'.
20) Milled and drilled cast iron bridge plug 15,340-15,858'. Washed over fish 15,858'; recovered fish. Cleaned out to old TD of 15,958'.
21) Drilled 4-3/4" new hole 15,958-16,498'.
22) Ran Drill Stem Test No. 1 (Silurian) 15,400-16,498'.
23) Drilled 4-3/4" hole 16,498' to total depth of 17,086' at 11 p.m. October 4, 1972.

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instruction reverse side)

Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

5. LEASE DESIGNATION AND SERIAL NO.: NM - 03429 - A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: - - -

7. UNIT AGREEMENT NAME: - - -

2. NAME OF OPERATOR: Shelly Oil Company

8. FARM OR LEASE NAME: West Jal Unit

3. ADDRESS OF OPERATOR: P. O. Box 730 - Hobbs, New Mexico 88240

9. WELL NO.: 1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FNL and 660' FEL Section 20-25S-36E

10. FIELD AND POOL, OR WILDCAT: Strawn Formation

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 20-25S-36E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3102' DF

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Cement, perforate & treat			☒
(Other)			☐	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

1) Perforated 2-7/8"OD tubing at 11,696',11,297', 10,574; 9698'; 8892';8707',8403'. Circulated to remove mud from annulus. Work began 1-29-69.
2) Pulled tubing
3) Ran 2-7/8"OD tubing with "RTTS" Packer. Set packer at 11,[illegible]'.
4) Squeezed 7"OD casing perforations 11,736-11,894' with 150 sacks class "H" Cement with 1% CFR-2 per sack, maximum pressure 4600#, failed. W.O.C. 4 hours. Broke formation down with 5000#.
5) Squeezed 7"OD casing perforations 11,736-11,894" with 50 sacks Class "H" cement with 1% CFR-2 and 5# No. 3 sand per sack. Displaced 35 sacks into formation. Pulled tubing and packer.
6) WOC 36 hours. Ran tubing with 6-1/8" bit. Top of cement inside 7"OD casing at 11,595'. Washed and circulated cement to 11,620'. Drilled cement 11,620-11,700'. Drilled packer 11,700-705'. Drilled cement 11,705-755'.
7) Tested casing to 3000#, held okay.
8) Spotted 12 bbls. acid 11,755-11,443'.
9) Perforated 7"OD casing with 2 shots per foot as follows:

11,510 - 513'	3'	6 shots
11,517- 527'	10'	20 shots
11,536 - 540'	4'	8 shots
11,550 - 556'	6'	12 shots
11,561 - 567'	6'	12 shots
11,575 - 579'	4'	8 shots
11,660 - 667'	7'	14 shots

18. I hereby certify that the foregoing is true and correct

SIGNED _____ TITLE District Production Manager DATE 3-10-69

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

(ORIGINAL SIGNED) V. E. Fletcher
APPROVED
MAR 11 1969
J. L. GORDON
ACTING DISTRICT ENGINEER

*See Instructions on Reverse Side

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: ~~73503~~ NM-03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: ----------

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

7. UNIT AGREEMENT NAME: ----------

2. NAME OF OPERATOR: **Shelly Oil Company**

8. FARM OR LEASE NAME: **West Jal Unit**

3. ADDRESS OF OPERATOR: **P. O. Box 730 - Hobbs, New Mexico 88240**

9. WELL NO.: **1**

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface: **1980 from North line and 660 from East line, Section 20**

10. FIELD AND POOL, OR WILDCAT: **Strawn Formation**

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: **20-25S-36E**

20-25S-36E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): **3092' DF**

12. COUNTY OR PARISH: **Lea**

13. STATE: **New Mexico**

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other)			
(Other) **Cement, Perforate & Treat**			X	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

Squeeze present perforated interval 11,736-11,852', below packer set at 11,700', with 125 sacks cement. Drill out to 11,790'. Perforate 11,510-11,783' with 2 shots per foot. Treat perforations 11,510-11,783' with 300 gallons 15% acid with 3 stage treatment using Dowell J-182 as diverting agent. Inject 72 barrels distillate to remove diverting agent. Swab and test.

18. I hereby certify that the foregoing is true and correct

SIGNED (signed) C. R. DAVIS TITLE District Operations Manager DATE 1/24/69

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____

CONDITIONS OF APPROVAL, IF ANY:

APPROVED

JAN 2[illegible]

J. L. GORDON
ACTING DISTRICT ENGINEER

RT/jc

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

2. NAME OF OPERATOR: Skelly Oil Company

3. ADDRESS OF OPERATOR: P. O. Box 730 - Hobbs, New Mexico 88240

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' from North line and 660' from East line

5. LEASE DESIGNATION AND SERIAL NO.: NM - 03429-A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: - -

7. UNIT AGREEMENT NAME: - -

8. FARM OR LEASE NAME: West Jal Unit

9. WELL NO.: 1

10. FIELD AND POOL, OR WILDCAT: Jal Strawn West

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: 20-25S-36E

14. PERMIT NO.: - -

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3138'

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Eliminate water production			☒
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

(1) Moved in and rigged up workover rig 10-21-68
(2) Set Schlumberger "plus" plug in 7"OD casing at 11,844'.
(3) Dumped 5' cement on top of plug, filling from 11,844' to 11,839'.
(4) Dumped 200 lbs. Hydromite on top of "plus" plug, filling back to 11,832'.
(5) Swabbed well.
(6) Apparent communications still exist between upper and lower perforations behind 7"OD casing. Objective to shut off lower perforations 11,860 - 11,894' and to decrease water production unsuccessful.
(7) Well returned to producing status 10-27-68 flowing 150 MCF gas per day through 7" OD casing perforations 11,736 - 11,894'.

18. I hereby certify that the foregoing is true and correct

SIGNED [signature] TITLE District Production Manager DATE 10-30-68

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

APPROVED
NOV 1968
J. L. GORDON
ACTING DISTRICT ENGINEER

*See Instructions on Reverse Side

70

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: NM - 03429 - A

6. IF INDIAN, ALLOTTEE OR TRIBE NAME: -----

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☒ OTHER

7. UNIT AGREEMENT NAME: -----

2. NAME OF OPERATOR: SKELLY OIL COMPANY

8. FARM OR LEASE NAME: West Jal Unit

3. ADDRESS OF OPERATOR: P. O. Box 730 - Hobbs, New Mexico 88240

9. WELL NO.: 1

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FNL & 660' FEL Sec. 20-25S-36E

10. FIELD AND POOL, OR WILDCAT: Jal Strawn West

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 20-25S-36E

14. PERMIT NO.: -----

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3138' DF

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Clean, Determine Water Source, Eliminate Water Production			X
(Other)	☐		☐	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

Moved in and rigged up Workover Rig. Killed well. Ran 1-5/8" drill pipe and fishing tools to top of fish at 9901', pushed to 9991', caught fish, circulated and pulled out of hole. Recovered 2 strings of fishing tools previously left in hole. Reran 1-5/8" drill pipe several times with fishing tools and recovered 1786' in several pieces of 5/16" wire line, and a chemical cutter.

Tagged bottom of 2-7/8"OD tubing at 11,715'. Knocked off one foot of tubing and a bull plug that had been previously cut off. Pushed and drove bull plug to 12,482'. Hit firm fill-up of formation cavings and left one-foot piece of 2-7/8"OD tubing and bull plug in hole at 12,482', leaving tubing open-ended at 11,715' with full 2-7/8" opening. Pulled drill pipe and fishing tools and installed Xmas tree. Ran Gradiomanometer, Continuous Flowmeter and Packer Flowmeter to determine water source. Surveys indicated water source being produced through casing perforations 11,883-11,894'.

Set packer at 11,883'. Returned to production status November 19, 1967, producing 38 bbls. oil, 800 bbls. water and 2,000 MCF gas per day from the Strawn Gas Pool through perforations 11736-11894' through 7"OD casing.

18. I hereby certify that the foregoing is true and correct

SIGNED (ORIGINAL SIGNED) V. E. Fletcher TITLE District Superintendent DATE April 25, 1968

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

APPROVED
APR 26 1968
J. L. GORDON
ACTING DISTRICT ENGINEER

*See Instructions on Reverse Side

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R355.5.

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL ☐ GAS WELL ☒ DRY ☐ Other

b. TYPE OF COMPLETION: NEW WELL ☐ WORK OVER ☒ DEEP-EN ☒ PLUG BACK ☐ DIFF. RESVR. ☒ Other

2. NAME OF OPERATOR: Skelly Oil Company

3. ADDRESS OF OPERATOR: P. O. Box 1351, Midland, Texas 79701

4. LOCATION OF WELL (*Report location clearly and in accordance with any State requirements*)*
At surface: 1980' FNL and 660' FEL Sec. 20-25S-36E
At top prod. interval reported below
At total depth

5. LEASE DESIGNATION AND SERIAL NO.: NM-03429-A
6. IF INDIAN, ALLOTTEE OR TRIBE NAME: ---
7. UNIT AGREEMENT NAME: ---
8. FARM OR LEASE NAME: West Jal Unit
9. WELL NO.: 1
10. FIELD AND POOL, OR WILDCAT: Undesignated Fusselman
11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 20-25S-36E
12. COUNTY OR PARISH: Lea
13. STATE: New Mexico

14. PERMIT NO. / DATE ISSUED

15. DATE ~~SPUDDED~~ started: 7-28-72
16. DATE T.D. REACHED: 11-1-72
17. DATE COMPL. (*Ready to prod.*): 10-4-72
18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*: 3076' GR
19. ELEV. CASINGHEAD: ---

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
17,086'	17,020'	---	→	15,958-17,086'	---

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*: 16,449-16,614' (Fusselman)

25. WAS DIRECTIONAL SURVEY MADE: No

26. TYPE ELECTRIC AND OTHER LOGS RUN: BHC Sonic Gamma Ray with Caliper, Dual Laterolog, Continuous Dipmeter, Compensated Neutron & Formation Density

27. WAS WELL CORED: No

28. CASING RECORD (*Report all strings set in well*)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
20"	94#	869'	26"	1630 sacks	None
13-3/8"	72,61 & 68#	6300'	17-1/2"	3206 sacks	None
9-5/8"	53.5 & 47#	11,732'	12-1/4"	975 sacks	None

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
		(See attachment)		

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2-7/8"	14,967'	None

31. PERFORATION RECORD (*Interval, size and number*)
16,449-16,614' (Fourteen .33" holes over 165' interval)

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
11,510-11,741'	200 sacks Class "H" Cement
11,849-11,894'	150 sacks Class "H" Cement
16,449-16,614'	350 sacks Class "H" Cement
	(See attachment)

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (*Flowing, gas lift, pumping—size and type of pump*)	WELL STATUS (*Producing or shut-in*)
11-1-72	Flowing	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
11-14-72	24	24/64"	→	-0-	5950	216	----

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
1900#	---	→	-0-	5950	216	---

34. DISPOSITION OF GAS (*Sold, used for fuel, vented, etc.*): Sold

TEST WITNESSED BY:

35. LIST OF ATTACHMENTS: 2 copies each: Borehole Compensated Sonic Log - Gamma Ray, Compensated Neutron-Formation Density, Dual Laterolog, Gammatron

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED C.J. Love TITLE Dist. Prod. Manager DATE Dec. 20, 1972

*(See Instructions and Spaces for Additional Data on Reverse Side)

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Set Baker Cast Iron Bridge Plug at 13,400'. Spotted 2 sacks cement on top of bridge plug from 13,400' to 13,386'. Perforated 5-1/2" OD liner with 4 holes at 13,210' and squeezed with 85 sacks of cement. Drilled out cement to 13,386'. Perforated 5-1/2" liner with 4 shots per foot as follows: 13,247-13,270', 13,272-13,275', 13,286-13,292', 13,298-13,320', 13,326-13,329', 13,343-13,345', 13,356-13,360' for a total of 63' and 252 holes. Treated through 5-1/2" OD casing liner perfs. 13,247-13,360' (intervals) with 2500 gallons Mud Acid. Tested well several hours with volume to small to measure. Treated through 5-1/2" OD casing liner perfs. 13,247-13,360' (intervals) with 2500 gallons Mud Acid. Tested well several hrs. with volume to small to measure. Treated through 5-1/2" OD casing liner perfs. 13,247-13,360' (intervals) with 10,000 gallons 15% Regular Acid. Tested well several hours with volume to small to measure. Set Baker Cast Iron Model "N" Bridge Plug at 13,180'. Dumped 2 sacks of cement on top of plug, which plug well back from 13,180' to 13,166'. Perforated 5-1/2" OD liner with 4 holes per foot from 13,005' to 13,030' for a total of 25' and 100 holes. Treated through 5-1/2" OD liner perfs. 13,005-13,030' with 5,000 gallons 15% Regular Acid. Tested well several hours with volume too small to measure. We temporarily abandoned the testing of the Morrow Zone at this time. Set Halliburton "DC" Cement Retainer at 12,790' and squeezed 85 sacks of cement into 5-1/2" OD liner perfs. 13,005-13,030'. Plugged back total depth 12,790'. Perforated 7" OD casing with 4 holes per foot as follows: 11,736-11,741', 11,781-11,787', 11,808-11,815', 11,849-11,852', 11,860-11,894' for a total of 55' and 220 holes. Set Baker Model "F" Production Packer at 11,700'. Ran 2-7/8" OD 6.40# Buttress thread N-80 tubing to 11,715' and seated in Baker Model "F" Production Packer at 11,700' with perfs. 11,711-11,715'. Otis landing nipple position No. 1 at 11,709'. Otis side door shift valve at 11,698'. Otis landing nipple position No. 2 at 10,700'. Otis landing nipple position No. 3 at 9700'. Opened well up and flowed to pit to clean up. Shut well in for 89 hours. After 89 hours with dead weight T.P. 6218# flowed and tested well in the following manner:

Flowed 1-3/4 hours on 10/64" choke, opening TP 6218# (DW), FTP 6156psi., gas volume 2,737 MCFPD and 7.60 bbls. of 52 degree corrected gravity condensate.
Next two hours flowed through 12/64" choke, FTP 6075 psi. (DW), gas volume 4563 MCFPD and and 6.60 bbls. of condensate.
Next two hours flowed through 14/64" choke, FTP 5995 psi. (DW), gas volume 6025 MCFPD and 8.70 bbls. of condensate.
Next one and one half hours flowed through 16/64" choke, FTP 5915 psi. (DW), gas volume 8009 MCFPD and undetermined amount of condensate to pits.
Established 24 hour New Mexico Conservation Commission AOF Potential of 310,000 MCFPD.
Completed January 22, 1963, as a "Wildcat" completion in Strawn (Pennsylvanian) formation.
Total condensate recovery during 7-1/4 hrs. test was 22.80 bbls. to tank and undetermined amount to pits.

Well now shut in - Waiting on gas connection.

FORMATION RECORD

From	To	Feet		
0	12,058	12,058		
12,058	12,152	94		
12,152	12,477	325	Lime & Shale	- Top Atoka 12,152'
12,477	13,366	889	Sand	- Top Morrow 12,477'
13,366	14,583	1,217	Shale	- Top Barnett Shale 13,366'
14,583	14,685	102	Lime	- Top Mississippian 14,853'
14,685	15,138	453	Chert	- Top Cherty 14,685'
15,138	15,518	380	Shale	- Top Woodford 15,138
15,518	15,958	440	Lime & Dolmite	- Top Devonian 15,518'
[illegible]	15,958		Total Depth	
	12,790		Plugged Back Total Depth	

Geological Tops by Schlumberger Gamma Ray Sonic Log

APPENDIX B

IDENTIFICATION OF OPERATORS, LESSEES, SURFACE OWNERS, AND OTHER INTERESTED PARTIES WITHIN ONE MILE OF THE PROPOSED INDEPENDENCE AGI #1; DRAFT NOTICE LETTER, AND CERTIFIED MAIL RECEIPTS

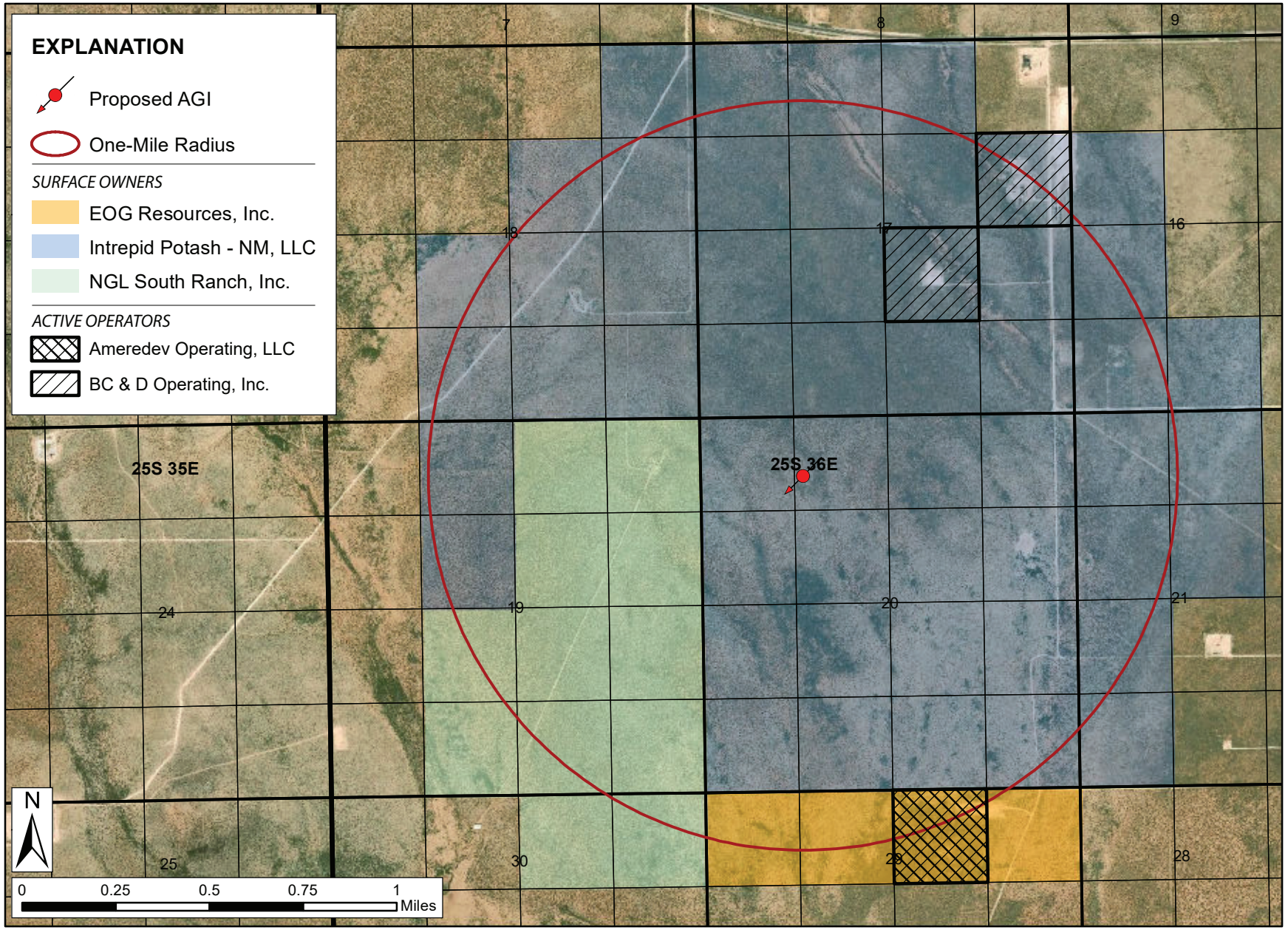


Figure B-1. Surface owners and active operators within one mile of proposed Independence AGI #1

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

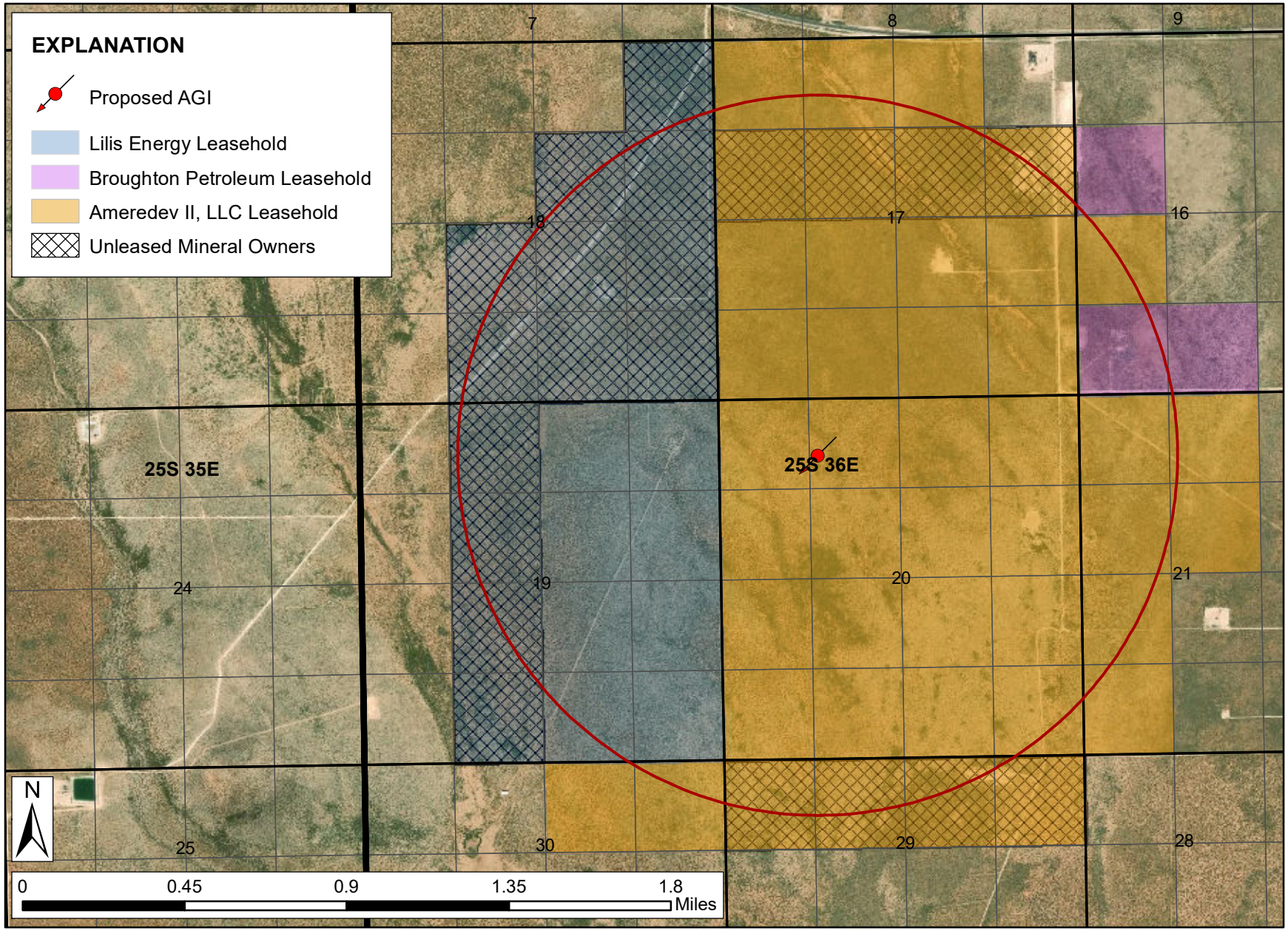


Figure B-2. Leaseholders and mineral ownership within one mile of the proposed AGI.
NOTE: State of NM and BLM hold mineral rights in all sections within one mile.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

TABLE B-1. SUMMARY LIST OF ALL OPERATORS , SURFACE OWNERS, LESSEES, AND UNLEASED INTEREST OWNERS WITHIN ONE MILE OF THE PROPOSED INDEPENDENCE AGI #1

ENTITY	ADDRESS	CITY	STATE	ZIP	INTEREST TYPE	LOCATION
EOG Resources, Inc.	5509 Champions Drive	Midland	TX	79706	Surface Owner	S29 (N/2 N/2)
Intrepid Potash - NM, LLC	P.O. Box 101	Carlsbad	NM	88221	Surface Owner	S16 (SW/4 NW/4, W/2 SW/4, SE/4 SW/4) S17 (W/2, W/2 E/2, E/2 SE/4, SE/4 NE/4) S18 (SE/4, E/2 SW/4, S/2 NE/4, NE/4 NE/4) S19 (E/2 NW/4) S20 (ALL) S21 (NW/4, W/2 SW/4)
NGL South Ranch, Inc.	3773 Cherry Creek North Drive, #1000	Denver	CO	80209	Surface Owner	S19 (E/2, E/2 SW/4) S30 (N/2 NE/4)
Ameredev II, LLC	5707 Southwest Pkwy, Bldg 1, #275	Austin	TX	78735	Active Operator	S29 (NW/4 NE/4)
BC & D Operating, Inc.	1008 West Broadway	Hobbs	NM	88240	Active Operator	S17 (SE/4 NE/4, NW/4 SE/4)
Ameredev II, LLC	5707 Southwest Pkwy, Bldg 1, #275	Austin	TX	78735	Lessee	S16 (NW/4 SW/4) S17 (ALL) S20 (ALL) S21 (W/2) S28 (W/2, NE/4) S29 (ALL) S30 (NE/4, N/2 SE/4)
Blackbeard Resources, LLC	1751 River Run, #405	Fort Worth	TX	76107	Lessee	
Broughton Petroleum, Inc.	P.O. Box 1389	Sealy	TX	77474	Lessee	S16 (E/2, E/2 W/2, W/2 NW/4, SW/4 SW/4)
Lilis Energy, Inc.	201 Main Street, Suite 700	Fort Worth	TX	76102	Lessee	S18 (E/2, E/2 SW/4) S19 (E/2, E/2 W/2)
Robert E. Landreth	110 W. Lousiana, #404	Midland	TX	79701	Lessee	
Veritas Permian Resources, LLC	P.O. Box 10850	Fort Worth	TX	76114	Lessee	
A.H. Cole	524 NW 42nd Street	Oklahoma City	OK	73118	Unleased min. owner	
Andrea Nichols	14100 Montford Drive, #1236	Dallas	TX	75254	Unleased min. owner	
Annie Lee Orr	413 Rambling Rose Way	Moore	SC	29369	Unleased min. owner	
Brenda Bowers	214 Ruth Road	Nogal	NM	88341	Unleased min. owner	
Brenda Katherine Erwin	59 CR 161	Houlka	MS	38850	Unleased min. owner	
Brian Williams	8213 Quail Creek Drive	Rowlett	TX	75089	Unleased min. owner	
Burlington Resources	925 North Eldridge Parkway	Houston	TX	77079	Unleased min. owner	
Charles F. Chambers, III	11818 Village Park Circle	Houston	TX	77024	Unleased min. owner	
Charles Frederick Chambers Family Trust	9505 Northpoint Blvd. #2015	Spring	TX	77379	Unleased min. owner	

TABLE B-1 (CONT'D)

ENTITY	ADDRESS	CITY	STATE	ZIP	INTEREST TYPE	LOCATION
Chevron U.S.A., Inc.	1111 Bagby Street	Houston	TX	77002	Unleased min. owner	
D.Y. Thompson	665 SW Port Malabar Blvd., #102	Palm Bay	FL	32905	Unleased min. owner	
David Neal Dean	9601 Southbrook Dr., #S105	Jacksonville	FL	32256	Unleased min. owner	
David Newman Payne, JR.	2300 Pimmit Drive, #404	Falls Church	VA	22043	Unleased min. owner	
Donal Woods, Deceased	1120 E Roxana Street	Hobbs	NM	88240	Unleased min. owner	
Dudley M. Smith	2670 Vining Street	Melbourne	FL	32904	Unleased min. owner	
Edmond D. Smith	245 Waters Street	Lake CHarles	LA	70607	Unleased min. owner	
Edward A. Bowers	4405 Bradley Lane	Arlington	TX	76017	Unleased min. owner	
Ellen Blanford	4335 Bradley Lane	Arlington	TX	76017	Unleased min. owner	
Estate of Cassius L. Smith	934 Saint James Drive	Langhorne	PA	19047	Unleased min. owner	
Estate of Eva W. Graham	10524 Connell Road	Charlotte	NC	28227	Unleased min. owner	
Estate of Harry E. Smith	312 Silvercliff Drive	Mount Holly	NC	28120	Unleased min. owner	
Estate of Jane Cromartie Williams	16 Cordova Street	St. Augustine	FL	32084	Unleased min. owner	
Estate of Kathleen A. Smith	2683 Anitoch Road	Perry	OH	44081	Unleased min. owner	
Estate of Lillian Smith Ward	9113 Storrington Way	Raleigh	NC	27615	Unleased min. owner	
Estate of Richard Cromartie, JR.	155 Ocean Lane Drive, #1003	Key Biscayne	FL	33149	Unleased min. owner	
Geneva Louise Magaro	3535 Westphalia Road	Mattituck	NY	11952	Unleased min. owner	
Jack Royal	1055 9th Avenue, #414	San Diego	CA	92101	Unleased min. owner	
James L. Bowers	631 North Central Avenue	Chicago	IL	60644	Unleased min. owner	
Jeremy Young	2105 Kings Road	Carrollton	TX	75007	Unleased min. owner	
Jill Gray	16529 Woodside Drive	Justin	TX	76247	Unleased min. owner	
John Thomas C/O Wells Fargo Bank	2714 Smith Street	Houston	TX	77006	Unleased min. owner	
Kassandra Dawn Dittmer	464 South 150 East	Ivins	UT	84738	Unleased min. owner	
Kathleen F. Smith	7602 Clays Lane	Windsor Mill	MD	21244	Unleased min. owner	
Katie V. Schutten	1702 North Market	Shawnee	OK	74804	Unleased min. owner	
Margaret Couls	12005 Kelly Road	Atascosa	TX	78002	Unleased min. owner	
Mary Frances Orr Gibbs	527 Richwood Down Drive	Laurens	SC	29360	Unleased min. owner	
Michell Lorraine Erwin	63 CR 155	Houlka	MS	38850	Unleased min. owner	
Nancy Carolyn Haley, Deceased	P.O. Box 86	Dillon	CO	80435	Unleased min. owner	
Nancy Sewell Serwatka	705 Post Oak Court	El Paso	TX	79932	Unleased min. owner	
Nathan Allen Dittmer	40 Diagonal Street, Apt. B	Saint George	UT	84770	Unleased min. owner	
Ohio State University	53 West 11th Street	Columbus	OH	43201	Unleased min. owner	

TABLE B-1 (CONT'D)

ENTITY	ADDRESS	CITY	STATE	ZIP	INTEREST TYPE	LOCATION
Oscar Juddson Moore, Jr.	22 North Marion Avenue	Tulsa	OK	74115	Unleased min. owner	
Quinton Smith	301 Lee Street	Oldsmar	FL	34677	Unleased min. owner	
Rebecca Stitt	3415 Merlin Drive	Clearwater	FL	33761	Unleased min. owner	
Richard A. Whittington	111 South Grandview Street	Mount Dora	FL	32757	Unleased min. owner	
Rob Williams	1038 Cedar Trail Drive	Cedar Hill	TX	75104	Unleased min. owner	
Scott Williams	4107 Timberbrook Court	Arlington	TX	76015	Unleased min. owner	
Southwest Petroleum Co., LP	P.O. Box 702377	Dallas	TX	75370	Unleased min. owner	
St. Joseph's Residence, Inc.	330 West Pembroke Avenue	Dallas	TX	75208	Unleased min. owner	
Steve R. Fine	3201 Robert Drive	Richardson	TX	75082	Unleased min. owner	
Tami Birlew	1409 Whispering Oaks Drive	Midlothian	TX	76065	Unleased min. owner	
Vivian Jones	2086 Old Train Road	Deltona	FL	32738	Unleased min. owner	
Walker Royalty	4925 Greenville Avenue, #500	Dallas	TX	75206	Unleased min. owner	
William B. Nichols	525 Maple Street	Sterling	NE	68443	Unleased min. owner	

***NOTE: Mineral ownership within one mile of the proposed AGI include areas managed by the Bureau of Land Management and the State of New Mexico. Notifications and copies of the C-108 application will be sent to these parties at the following addresses: Bureau of Land Management; 301 Dinosaur Trail; Santa Fe, NM 87508 and State of New Mexico; P.O. Box 1148; Santa Fe, NM 87501-1148.**

TABLE B-2. PARTIES TO BE INDIVIDUALLY NOTIFIED

Surface Owners:

EOG Resources, Inc.
5509 Champions Drive
Midland, TX 79706
(432)686-3600

Intrepid Potash – New Mexico, LLC.
P.O. Box 101
Carlsbad, NM 88221
(575)887-5591

NGL South Ranch, Inc.
3773 Cherry Creek North Dr., Suite 1000
Denver, CO 80209
(918)481-1119

Active Operators:

BC & D Operating, Inc.
1008 West Broadway
Hobbs, NM 88240
(575)393-2727

Lessees:

Blackbeard Resources, LLC
1751 River Run, #405
Fort Worth, TX 76107

Broughton Petroleum, Inc.
P.O. Box 1389
Sealy, TX 77474

Lilis Energy, Inc.
201 Main Street, Suite 700
Fort Worth, TX 76102

Robert E. Landreth
110 W. Louisiana, #404
Midland, TX 79701

Veritas Permian Resources, LLC
P.O. Box 10850
Fort Worth, TX 76114

TABLE B-2 (CONT'D)

Mineral Rights Owners:

Bureau of Land Management
301 Dinosaur Trail
Santa Fe, NM 87508

State Of New Mexico
P.O. Box 1148
Santa Fe, NM 87504-1148

ATTACHMENT A

SAMPLE NOTICE LETTER TO BE SENT TO INTERESTED PARTIES

&

SAMPLE PUBLIC NOTICE OF HEARING

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

ATTACHMENT A – SAMPLE NOTICE LETTER

May 5, 2020

Example Notice Letter
Party requiring notification
Address

VIA CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: CASE NUMBER XXXXX: AMEREDEV II, LLC PROPOSED INDEPENDENCE AGI #1

This letter is to advise you that Ameredev II, LLC (Ameredev) filed the enclosed C-108 application on XX/XX/2020, with the New Mexico Oil Conservation Commission seeking authorization to drill an acid gas injection (AGI) well at their planned gas processing facility (the "Plant") in Lea County, New Mexico. The AGI well will be a vertical well, located at approximately 829' FNL, 1,443' FWL in Section 20, Township 25 South, Range 36 East. Ameredev plans to inject up to 12 million standard cubic feet (MMSCF) per day of treated acid gas from the Plant at a maximum surface injection pressure of 5,214 psig into the Siluro-Devonian formations, approximately 16,230 feet to 17,900 feet below the surface. The proposed well will serve as a disposal well for acid gas at this facility.

This application (Case Number XXXXX) has been set for hearing before the New Mexico Oil Conservation Commission at XX:XX a.m. on XX/XX/2020, in the Wendell Chino Building at the New Mexico Oil Conservation Division's Santa Fe office located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. You are not required to attend this hearing, but as an owner of interest that may be affected by Ameredev's application, you may appear and present testimony. Failure to appear at that time and become a party of record will preclude you from challenging the application at a later date.

A party appearing at the hearing is required by Division Rule 19.15.4.13 NMAC to file a Pre-Hearing Statement at least four days in advance of the scheduled hearing, but in no event not later than 5:00 p.m. Mountain Time on the Thursday preceding the scheduled hearing date. This statement must be filed at the Division's Santa Fe office at the above-specified address and should include the names of the parties and their attorneys; a concise statement of the case; the names of all witnesses the party will call to testify at the hearing; the approximate time the party will need to present its case; and an identification of any procedural matters that need to be resolved prior to the hearing.

If you have any questions concerning this application, or to obtain an entire copy of the C-108, you may contact Alberto Gutiérrez, C.P.G. or David White at Geolex, Inc.®; 500 Marquette Avenue NW, Suite 1350; Albuquerque, New Mexico 87102.

Sincerely,
Geolex, Inc.®

Alberto A. Gutiérrez, C.P.G.
President
Consultant to Ameredev II, LLC

Enclosure: C-108 Application for Authorization to Inject

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ATTACHMENT A – SAMPLE PUBLIC NOTICE OF HEARING

Ameredev II, LLC, INSERT ADDRESS, filed Form C-108 (Application for Authorization to Inject) on XX/XX/2020, with the New Mexico Oil Conservation Division seeking authorization to drill, complete, and operate its proposed acid gas injection (AGI) well Independence AGI #1. The well will be a vertical well, located at approximately 829 feet FNL, 1,443 feet FWL in Section 20, T25S, R36E in Lea County, New Mexico, approximately six miles west of Jal, New Mexico. Ameredev plans to inject up to 12 million standard cubic feet (MMSCF) per day of treated acid gas at a maximum pressure of 4,779 psig into the Devonian to Montoya formations though an open hole completion between approximately 16,200 feet and a total depth of approximately 17,900 feet.

This application (Case Number XXXXX) has been set for hearing before the New Mexico Oil Conservation Commission at XX:XX a.m. on XX/XX/2020, in the Wendell Chino Building at the New Mexico Oil Conservation Division's Santa Fe office located at 1220 South Saint Francis Drive, Santa Fe, New Mexico 87505. Interested parties that may be affected by Ameredev's application may appear and present testimony by filing a Pre-Hearing Statement with the Divisions Santa Fe office at the above-specified address at least four days in advance of the scheduled hearing date. Additional information can be obtained from the applicant's agent, Geolex, Inc.®; 500 Marquette Avenue NW; Suite 1350; Albuquerque, New Mexico 87102; (505)842-8000.

ATTACHMENT B

LAND DATA

SURFACE OWNERSHIP, LESSEES, AND UNLEASED MINERALS OWNERS WITHIN ONE MILE OF THE PROPOSED AGI

(PROVIDED BY AMEREDEV II, LLC)

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

SURFACE OWNERS, LESSEES, AND UNLEASED MINERAL OWNERS
(ONE-MILE RADIUS)

OWNER	ADDRESS	CITY	STATE	ZIP	TYPE
A.H. COLE	524 NW 42ND STREET	OKLAHOMA CITY	OK	73118	UNLEASED
ANDREA NICHOLS	14100 MONTFORD DRIVE, APT 1236	DALLAS	TX	75254	UNLEASED
ANNIE LEE ORR	413 RAMBLING ROSE WAY	MOORE	SC	29369	UNLEASED
BLACKBEARD RESOURCES, LLC	1751 RIVER RUN, SUITE 405	FORT WORTH	TX	76107	LESSEE
BRENDA BOWERS	214 RUTH RD.	NOGAL	NM	88341	UNLEASED
BRENDA KATHERINE ERWIN	59 CR 161	HOULKA	MS	38850	UNLEASED
BRIAN WILLIAMS	8213 QUAIL CREEK DRIVE	ROWLETT	TX	75089	UNLEASED
BROUGHTON PETROLEUM, INC.	PO BOX 1389	SEALY	TX	77474	LESSEE
BURLINGTON RESOURCES OIL & GAS CO., LP	925 N. ELDRIDGE PARKWAY	HOUSTON	TX	77079	UNLEASED
CHARLES F. CHAMBERS, III	11818 VILLAGE PARK CIR	HOUSTON	TX	77024	UNLEASED
CHARLES FREDERICK CHAMBERS FAMILY TRUST	9505 NORTHPOINTE BLVD APT 2015	SPRING	TX	77379	UNLEASED
CHEVRON U.S.A., INC.	1111 BAGBY ST.	HOUSTON	TX	77002	UNLEASED
D Y THOMPSON	665 SW PORT MALABAR BLVD., APT. 102	PALM BAY	FL	32905	UNLEASED
DAVID NEAL DEAN	9601 SOUTHBROOK DR APT. S105	JACKSONVILLE	FL	32256	UNLEASED
DAVID NEWMAN PAYNE, JR.	2300 PIMMIT DR., #404	FALLS CHURCH	VA	22043	UNLEASED
DONALD WOODS, DECEASED	1120 E ROXANA ST	HOBBS	NM	88240	UNLEASED
DUDLEY M SMITH	2670 VINING ST.	MELBOURNE	FL	32904	UNLEASED
EDMOND D SMITH	245 WATERS ST.	LAKE CHARLES	LA	70607	UNLEASED
EDWARD A BOWERS	4405 BRADLEY LN.	ARLINGTON	TX	76017	UNLEASED
ELLEN BLANFORD	4335 BRADLEY LN	ARLINGTON	TX	76017	UNLEASED
EOG RESOURCES, INC.,	5509 CHAMPIONS DRIVE	MIDLAND	TX	79706	SURFACE OWNER
ESTATE OF CASSIUS L SMITH	934 SAINT JAMES DR.	LANGHORNE	PA	19047	UNLEASED
ESTATE OF EVA W. GRAHAM	10524 CONNELL RD.	CHARLOTTE	NC	28227	UNLEASED
ESTATE OF HARRY E SMITH	312 SILVERCLIFF DR.	MOUNT HOLLY	NC	28120	UNLEASED
ESTATE OF JANE CROMARTIE WILLIAMS	16 CORDOVA ST.	ST. AUGUSTINE	FL	32084	UNLEASED
ESTATE OF KATHLEEN A SMITH	2683 ANITOCH RD.	PERRY	OH	44081	UNLEASED
ESTATE OF LILLIAN SMITH WARD	9113 STORRINGTON WAY	RALEIGH	NC	27615	UNLEASED
ESTATE OF RICHARD CROMARTIE, JR.	155 OCEAN LANE DR., APT. 1003	KEY BISCAYNE	FL	33149	UNLEASED
GENEVA LOUISE MAGARO	3535 WESTPHALIA RD	MATTITUCK	NY	11952	UNLEASED
INTREPID POTASH - NEW MEXICO, LLC	PO BOX 101	CARLSBAD	NM	88221	SURFACE OWNER
JACK ROYAL	1055 9TH AVE APT 414	SAN DIEGO	CA	92101	UNLEASED
JAMES L BOWERS	631 N CENTRAL AVE.	CHICAGO	IL	60644	UNLEASED
JEREMY YOUNG	2105 KINGS ROAD	CARROLLTON	TX	75007	UNLEASED
JILL GRAY	16529 WOODSIDE DR	JUSTIN	TX	76247	UNLEASED
JOHN THOMAS C/O WELLS FARGO BANK	2714 SMITH ST	HOUSTON	TX	77006	UNLEASED
KASSANDRA DAWN DITTMER	464 S 150 E	IVINS	UT	84738	UNLEASED
KATHLEEN F SMITH	7602 CLAYS LN	WINDSOR MILL	MD	21244	UNLEASED
KATIE V. SCHUTTEN	1702 N. MARKET	SHAWNEE	OK	74804	UNLEASED
LILIS ENERGY, INC.	201 MAIN STREET, SUITE 700	FORT WORTH	TX	76102	LESSEE
MARGARET COULS	12005 KELLY RD.	ATASCOSA	TX	78002	UNLEASED
MARY FRANCES ORR GIBBS	527 RICHWOOD DOWN DR.	LAURENS	SC	29360	UNLEASED
MICHELLE LORRAINE ERWIN	63 CR 155	HOULKA	MS	38850	UNLEASED
NANCY CAROLYN HALEY, DECEASED	PO BOX 86	DILLON	CO	80435	UNLEASED
NANCY SEWELL SERWATKA	705 POST OAK COURT	EL PASO	TX	79932	UNLEASED
NATHAN ALLEN DITTMER	40 DIAGONAL ST APT B	SAINT GEORGE	UT	84770	UNLEASED
NGL SOUTH RANCH INC.	3773 CHERRY CREEK NORTH DR. SUITE 1000	DENVER	CO	80209	SURFACE OWNER
OHIO STATE UNIVERSITY	53 W. 11TH ST.	COLUMBUS	OH	43201	UNLEASED
OSCAR JUDDSON MOORE, JR.	22 N MARION AVE	TULSA	OK	74115	UNLEASED
QUINTON SMITH	301 LEE ST.	OLDSMAR	FL	34677	UNLEASED
REBECCA STITT	3415 MERLIN DR.	CLEARWATER	FL	33761	UNLEASED
RICHARD A WHITTINGTON	111 S GRANDVIEW ST.	MOUNT DORA	FL	32757	UNLEASED
ROB WILLIAMS	1038 CEDAR TRAIL DRIVE	CEDAR HILL	TX	75104	UNLEASED
ROBERT E. LANDRETH	110 W. LOUISIANA, SUITE 404	MIDLAND	TX	79701	LESSEE
SCOTT WILLIAMS	4107 TIMBERBROOK COURT	ARLINGTON	TX	76015	UNLEASED
SOUTHWEST PETROLEUM COMPANY, LP	PO BOX 702377	DALLAS	TX	75370	UNLEASED
ST. JOSEPH'S RESIDENCE INC.	330 W PEMBROKE AVE.	DALLAS	TX	75208	UNLEASED
STEVE R FINE	3201 ROBERT DR.	RICHARDSON	TX	75082	UNLEASED
TAMI BIRLEW	1409 WHISPERING OAKS DRIVE	MIDLOTHIAN	TX	76065	UNLEASED
VERITAS PERMIAN RESOURCES, LLC	PO BOX 10850	FORT WORTH	TX	76114	LESSEE
VIVIAN JONES	2086 OLD TRAIN RD.	DELTONA	FL	32738	UNLEASED
WALKER ROYALTY	4925 GREENVILLE AVE., SUITE 500	DALLAS	TX	75206	UNLEASED
WILLIAM B. NICHOLS	525 MAPLE ST	STERLING	NE	68443	UNLEASED

IN COMPILING THIS LIST, AMEREDEV II, LLC CONDUCTED A DILIGENT SEARCH OF ALL AVAILABLE PUBLIC RECORDS, INCLUDING THOSE OF THE STATE LAND OFFICE, OIL CONSERVATION DIVISION, BUREAU OF LAND MANAGEMENT, AND LEA COUNTY RECORDS

APPENDIX C

PRELIMINARY DRILLING-FLUIDS PROGRAM GENERATED BY ARTESIA LUMBER CO. FOR THE PROPOSED AMEREDEV AGI

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

artesia lumber co.

GEOLEX®
INCORPORATED

Drilling Fluids Program

AGI Section #20

17,600' TVD / MD

T-25-S, R-36-E, Section 20

Lea County, New Mexico

Prepared for:

Mr. Rick Armstrong

Prepared By: Brian Anderson ***February 25, 2020***

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Geolex Incorporated
C/O EWS Consulting
400 East Loop 250 North
Midland, Texas 79705

artesia lumber co.

Attention: Mr. Rick Armstrong

February 25, 2020

Dear Mr. Armstrong:

Thank you for giving Buckeye Inc., the opportunity to submit our Drilling Fluids recommendations and cost estimate for your ***AGI Section #20*** prospect located in T-25-S, R-36-E, Section 20 in Lea County, New Mexico.

The estimated mud cost on this project including trucking and taxes is [redacted] with no adverse well bore problems such as excessive lost circulation or mud weights.

Artesia Lumber Company / Buckeye, Inc. can supply two twenty ton Barite bulk tanks for the location at the cost of [redacted] each per tank. The Operator will be responsible for mobilization and demobilization to and from the Buckeye, Inc. yard at Midland, Texas. Bulk products are F.O.B. Midland, Texas warehouse. Technical Service Representatives are available at the day rate of [redacted] per person. Operator will be responsible for furnishing trailer facility for Buckeye, Inc. Technical Representative.

The Buckeye Inc. Technical Service Representative will monitor the fluid properties and product inventories. Annular pressure drops, ECDs, and well bore cleaning rheologies are to be calculated and maximized for overall efficiency.

Our commitment to safety includes: Employing a DOT / Safety Director, holding monthly safety meetings with an emphasis on rig and vehicular safety and equipping all Buckeye vehicles with GPS monitoring software.

Call / email me or Byron Beasley at the main Buckeye, Inc. number if you have any questions pertaining this program. That number since 1964 is: 432.682.7422.

Regards,

Brian Anderson

Brian Anderson

The Artesia Lumber Company / Buckeye, Inc.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

Well Synopsis

OPERATOR:	Geolex, Inc.
WELL NAME:	AGI Section #20
DEPTH:	***17,600' TVD / MD***
LEGALS:	T-25-S, R-36-E, Section 20
COUNTY:	Lea
STATE:	New Mexico
MUD TYPE:	***Surface*** – Spud Mud ***First Intermediate*** – Brine ***Second Intermediate*** – Cut brine / Xanthan Gum ***Liner*** – Brine / Xanthan Gum / Barite ***Open Hole*** – Fresh water / Xanthan Gum
ESTIMATED DAYS: (1) (2)	45 – 60
ESTIMATED DOLLARS: (1) (2)	Estimated Drilling fluids [redacted]
WAREHOUSE CONTACT:	Artesia, New Mexico 575.748.1363 (answered 24 hours)
MUD ENGINEER CONTACT:	Phil Bussell Cellular 575.513.0786
OFFICE CONTACT:	Kyle Patterson – Engineering Manager Office 432.682.7422 Cellular 432.260.9811 ***e-mail kyle@buckeyeinc.com***
DATE:	February 25, 2020

- ***Estimated days and dollars exclude severe loss of circulation, plugbacks, sidetracks, deviation from center and/or prolonged days on location for unexpected circumstances..***
- ***Estimated dollars include materials, trucking, taxes – but exclude reconditioning, disposals and/or liquid dilution.***

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

CASING PROGRAM

Interval	*Casing Size*	*Hole ID*	*Depth*
Surface	**20”**	**24”**	**1,350’**
Intermediate	**13 3/8”**	**17 1/2"**	**6,100’**
Second Intermediate	**9 5/8”**	**12 1/4”**	**12,300’**
Production	**7” Liner**	**8 5/8”**	**12,100 – 16,000’**
Open hole section	**-**	**5 7/8”**	**17,600’**

POSSIBLE PROBLEM S PER INTERVAL

Surface @ 1,350’	• Lost circulation. • Unconsolidated surface.
Intermediate @ 6,100’	• Seepage, lost circulation. • Key seating. • Drag across red bed. • Well bore cleaning.
Second Intermediate @ 12,300’	• Seepage, lost circulation. • Well bore cleaning.
Liner @ 16,000’	• Seepage, lost circulation. • Abnormal pressure.
Open hole section @ 17,600’	• Seepage, lost circulation.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

ESTIMATED FORMATION TOPS

Dockum	*349'*	*Bone Spring*	*7,611'*
Ochoa-Dewey	*891'*	*Wolfcamp*	*10,750'*
Rustler	*1,322'*	*Strawn*	*11,850'*
Salado	*1,799'*	*Atoka*	*13,148'*
Tansill	*2,792'*	*Morrow*	*13,819'*
Yates	*2,923'*	*Barnett*	*15,082'*
Seven Rivers	*2,944'*	*Osage*	*15,457'*
Capitan Reef	*3,262'*	*Woodford*	*15,942'*
Lamar	*4,580'*	*Woodford Base*	*16,228'*
Bell Canyon	*4,699'*	*Wristen*	*17,202'*
Cherry Canyon	*5,509'*	*Fusselman*	*17,478'*
Brushy Canyon	*6,468'*	***Total Depth***	***17,600'***
		Montoya	*17,853'*

PRODUCT DESCRIPTION

PRODUCT	*USE*	*LIMITATIONS*
Fresh water Gel ***(Wyoming Bentonite)***	**Viscosifier for fresh water**	**Chloride limitations**
Salt Gel **(Attapulgite)**	**Viscosifier for use in Salt Systems. Will work in fresh water and Brine**	**No chloride limitations**
Lime **(Calcium Hydroxide)**	**pH control in fresh and brine water**	**None**
Xanthan Gum **(bio polymer)**	**Viscosifier for fresh water and Brine**	**None**
Paper **(Ground Paper)**	**For seepage control in clear water drilling**	**None**
Soda Ash **(Sodium Carbonate)**	**Treat out calcium**	**None**
Caustic Soda **(Sodium Hydroxide)**	**pH control for both fresh water and Brine**	**Personal Protection Equipment**
Pac LV **(Polyanionic cellulose)**	**Filtrate Reducer for both fresh water and Brine**	**Calcium and Magnesium**
Starch White **(Pre-gelatinized starch)**	**Filtrate Reducer for both fresh water and Brine**	**Must be used in conjunction with a biocide. Susceptible to bacteria**
BIO 610D **(Magnesium Nitrate)**	**Biocide**	**PPE**
BCI-Lube **(Oil soluble lubricant)**	**Friction and torque reducer in both fresh water and brine**	**Excessive amounts of lubricant and high pH**
MF – 55 **(Non Ionic Polyacrylamide)**	**Total flocculent for both fresh water and brine**	**None**

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

0' – 1,350'

Fluid Type	Spud mud / Bentonite
Potential Hazards	Lost circulation / well bore cleaning due to low annular velocity in large well bore

0' – 1,350'

Drill a 24" well bore and set 20" surface.

Drilling Fluid Recommendations

Interval Depth (feet) (MD/TVD)	Density (Ppg)	Viscosity (sec/quart)	Plastic Viscosity (cps)	Yield Point (lbs/100 ft.^{2})	pH	Filtrate - API (Cm3/30 min.)	Solids (% Volume)	Chloride (mg/L)
0' – 1,350'	8.5 – 9.2	36 – 40	8 – 10	8 – 15	8.0 – 9.0	NC	< 5	1k – 5k

0' – 1,350'

- **Start drilling in the *closed loop system* with *Spud mud*: Add fresh water to the suction pit, treat out the calcium with 1 pound per barrel of *Soda Ash*. Utilize additions of *Bentonite* for a 36 – 40 sec/quart viscosity.**
- Maintain a 36 – 40 sec/quart viscosity circulating the working pits. Run water as needed to control viscosity and mud weight.
- Running both pumps will provide additional velocity to assist in cleaning the well bore.
- Should gravel or poor well bore cleaning be encountered, increase viscosity as necessary with additions of ***Bentonite*** +/- 60 sec/quart.
- If seepage is severe, or returns are lost, mix a lost circulation slurry. Utilize additions of the following:
    1. Fill the pre-mix pit with 100 barrels of fresh water
    2. 1 pound per barrel ***Soda Ash***
    3. ***Bentonite*** for a 40 – 45 sec/quart viscosity
    4. 2 pounds per barrel ***Fluid Seal***
    5. 2 pounds per barrel ***PW LCM***
    6. 2 pounds per barrel ***Ironwood***
    7. ***Pump*** the pills to the loss zone at a reduced pump rate until returns are regained. ***Never mix lost circulation material other than Paper directly in fresh water.***
- If returns are not established after pumping the lost circulation pill, drill remainder of conductor with no returns. Pump 40 – 45 sec/quart viscosity sweeps to clean the well bore.

1,350' – 6,100'

Fluid Type	Brine / Prehydrated Bentonite sweeps
Potential Hazards	Seepage / lost circulation

1,350' – 6,100'

Drill a 17 1/2" well bore and set 13 3/8" casing.

Drilling Fluid Recommendations

Interval Depth (feet) (MD/TVD)	Fluid Density (Ppg.)	Viscosity (sec/quart)	Plastic Viscosity (cps)	Yield Point (lbs/100 ft.^{2})	pH	Filtrate - API (Cm3/30 min.)	Solids (% volume)	Chloride (mg/L)
1,350'– 6,100'	10.0 – 10.1	28 – 29	NA	NA	10.5	NC	< 5	165k – 185k

1,350' – 6,100'

- Drill out with brine water circulating the ***closed loop***. Utilize additions of brine at the flow line for volume.
- Consistent additions of ***Paper*** for seepage control added at the pump, as needed.
- Rig up a chemical barrel at the flow line. Mix ***MF – 55*** with fresh water. Drip a stream in continuously while drilling this interval. This will help to maintain a low solids fluid at the suction.
- Utilize additions of ***Lime*** for a pH of 10.5. Mix ***Lime*** through the chemical barrel, not the mud hopper.
- Each connection, add one ***Soap Stick*** dropped directly down the drill pipe to minimize bit balling in this interval.
- **Well bore cleaning sweep:**
  1. Fill the steel working pits (slug pit) with fresh water
  2. First, add two sacks of ***Soda Ash*** per 100 barrels (one pound per barrel)
  3. NO ***LIME*** OR ***CAUSTIC SODA*** IN PREMIXES
  4. Add ***Bentonite*** (Fresh Gel) for a 90 sec/quart viscosity
  5. Pump 10 – 15 barrels of the slurry every connection or two for a well bore cleaning sweep
- **PHPA sweep:**
  1. Rig up a Paper barrel connected directly to the mud pump
  2. Whenever you pump a pre-hydrated ***Bentonite*** well bore cleaning sweep, follow that with 2 1/2 gallons of ***PHPA*** added to the Paper barrel and pump immediately following high viscosity sweep.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

- If seepage is severe, or returns are lost, mix a Lost Circulation Pill. Utilize additions of the following:
    1. Fill the pre-mix pit with 100 barrels of fresh water
    2. 1 pound per barrel ***Soda Ash***
    3. ***Bentonite*** for a 40 – 45 sec/quart viscosity
    4. 2 pounds per barrel ***Fluid Seal***
    5. 2 pounds per barrel ***Ironwood***
    6. 2 pounds per barrel ***PW LCM***
- After reaching total depth of the intermediate section, sweep the well bore with a 50 barrel (90 sec/quart), viscosity sweep and circulate it to the surface.
- ***Adjust mud properties as well bore conditions dictate. If necessary mud up with Salt Gel for a sufficient viscosity to insure a clean wellbore and Yellow Starch to reduce the filtrate prior to running first intermediate string.***

6,100' – 12,300'

Fluid Type	Cut brine / MF-55 / Xanthan Gum
Potential Hazards	Seepage / well bore cleaning

6,100' – 12,300'

Drill a 12 1/4" well bore and set 9 5/8" casing.

Drilling Fluid Recommendations

Interval Depth (feet) (MD TVD)	Fluid Density (Ppg.)	Viscosity (sec/quart)	Plastic Viscosity (cps)	Yield Point (lbs/100 ft.^{2})	pH	Filtrate - API (Cm3/30 min.)	Solids (% volume)	Chloride (mg/l)
6,100' – 11,800'	8.6 – 8.8	28 – 29	N/A	N/A	10.5 – 11.0	N/C	< 5	20k – 40k (*)
11,800' – 12,300'	8.6 – 8.8	34 – 40	8 – 15	10 – 12	10.5 – 11.0	8 – 15	< 5	20k – 40k (*)

(*) Chlorides as $NaCl^-$

6,100' – 11,800'

- Drill out from under the second intermediate casing with 8.6 – 8.8 pound per gallon cut brine. Circulate the steel working pits. ***Circulate a reserve pit should an exception be allowed***.
- Maintain a pH of 10.5 – 11, with additions of ***Lime.*** Mix ***Lime*** through the chemical barrel with fresh water and not through the mud hopper.
- Use ***Paper*** as needed for seepage control.
- Mix Prehydrated ***Bentonite*** in the premix pit with fresh water for a viscosity of 50 sec/quart for sweeps and pump 25 – 35 barrel sweeps every 250' – 500'. More often if drag or fill on connections is encountered.
- Pump a sweep prior to running any deviation surveys.
- Mix ***MF – 55*** at the flow line to maintain a low solids fluid at the suction.
- For severe losses, utilize ***Bentonite / LCM*** pills:
    1. Fill the pre-mix pit with 100 barrels of fresh water.
    2. Add ***Bentonite*** for a 40 – 45 sec/quart viscosity.
    3. Add 5 – 7 pounds per barrel ***Fluid Seal***
    4. Add 5 – 7 pounds per barrel ***PW LCM***
- Prior to total depth, pump a 100 barrel well bore cleaning sweep and circulate two bottoms up.
- Adjust mud properties as well bore conditions dictate.

11,800' – 12,300'

- Mud up to condition large well bore for 9 5/8" casing.
- Pits should contain 8.6 – 8.8 pound per gallon cut brine low in drill solids.
- Adjust with additions of ***Caustic Soda*** to maintain a pH of 10.5. Mix ***Caustic Soda*** in a separate barrel, NOT THE LIME BARREL. ***Use all PPE devices required when mixing Caustic Soda (goggles/face shield, Chemical resistant apron and elbow length gloves. Always use cold or cool water in the chemical barrel never use hot or warm water as this can cause a thermal reaction. This could result in serious injury or even death.***
- Make the addition of ***Xanthan Gum*** for a 34 – 40 sec/quart viscosity.
- Some filtrate control will be achieved from the ***Xanthan Gum***. If necessary, make additions of ***Pac LV*** to reduce filtrate to 8 – 15cc.
- No additions of ***White Starch*** is needed unless well bore conditions dictate.
- Should seepage be encountered, treat losses with additions of ***PW LCM, Fluid Seal,*** and ***Ironwood***.
- Adjust viscosity with ***Xanthan Gum*** as needed to insure adequate well bore cleaning.
- Should well bore conditions such as toque, drag, and shale be persistent, recommend addition of 2.0 – 4.0 pounds per barrel ***Sulphonated Asphalt***. ***Sulphonated Asphalt*** is an excellent torque and drag reducer, as well as a shale stabilizer.
- Circulate two bottoms up prior to running 9 5/8" casing.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

12,300' – 16,000'

Fluid Type	Brine water / Xanthan Gum / Barite / Pac LV
Potential Hazards	Seepage / lost circulation / abnormal pressure / well bore cleaning

12,300' – 16,000'.

Drill an 8 5/8" well bore and set 7" liner from 12,100' to 16,000'.

Drilling Fluid Recommendations

Interval Depth (feet) (MD TVD)	Fluid Density (Ppg.)	Viscosity (sec/quart)	Plastic Viscosity (cps)	Yield Point (lbs/100 ft.^{2})	pH	Filtrate - API (Cm3/30 min.)	Drill Solids (% volume)	Chloride (mg/l)
12,300' – 13,000'	10.0 – 11.0	36 – 40	10 – 15	8 – 10	10.5	10 – 12	< 5	165k – 185k
13,000' – 16,000'	12.4 – 12.9	40 – 45	12 – 18	10 – 15	10.5	8 – 10	< 5	165k – 185k

(*) Chlorides as $NaCl^-$

12,300' – 13,000'

- While waiting on cement and prior to drilling out. The steel pits should be cleaned and filled with 10.0 pound per gallon brine water that is low in drill solids.
- Start mudding up after dressing cement with the brine water.
- Adjust with additions of ***Caustic Soda*** to maintain a pH of 10.5. Mix ***Caustic Soda*** in a separate barrel, NOT THE LIME BARREL. ***Use all PPE devices required when mixing Caustic Soda (goggles/face shield, Chemical resistant apron and elbow length gloves. Always use cold or cool water in the chemical barrel never use hot or warm water as this can cause a thermal reaction. This could result in serious injury or even death.***
- Make the addition of one can of ***Silicone Defoamer*** per each 100 barrels of system volume. After the initial treatment of ***Silicone Defoamer***, use only ***WC-Defoamer*** for any foaming that may occur.
- Treat the system with one can of ***MBGA-25*** per each 200 barrels of system volume. ***MBGA-25*** is an excellent biocide to prevent bacterial degradation of the ***Xanthan Gum.*** Maintain a tourly treatment of ***MBGA-25*** to total depth of this interval.
- Make the addition of ***Xanthan*** Gum for a 36 – 40 sec/quart viscosity. Do not add any ***Barite*** to the mud until a yield point of 6 has been achieved.
- Reduce the filtrate to 10 – 12cc with additions of ***Pac LV***. 0.25 pound per barrel.
- Increase mud weight to a maximum of 11.0 pounds per gallon as well bore conditions dictate with additions of ***Barite*** as needed.
- Should seepage be encountered, treat losses with additions of ***PW LCM, Fluid Seal,*** and ***Ironwood***.
- Adjust viscosity with ***Xanthan Gum*** as needed to insure adequate well bore cleaning.
- Should well bore conditions such as toque, drag, and shale be persistent, recommend addition of 2.0 – 4.0 pounds per barrel ***Sulphonated Asphalt***. ***Sulphonated Asphalt*** is an excellent torque and drag reducer, as well as a shale stabilizer.

Exhibit No. 1
Ameredev Operating, LLC
Case No. 21381, Sept. 17, 2020

13,000' – 16,000'

- Maintain the filtrate at 8 – 10 cc with additions of ***Pac LV***.
- Maintain total hardness at 400 ppm or less with additions of ***Soda Ash.***
- Maintain viscosity at 40 – 45 sec/quart with additions of ***Xanthan Gum***.
- Increase mud weight to 12.4 – 12.9 pounds per gallon or as well bore conditions dictate dependent on abnormal pressure experienced.
- Continue to maintain a pH of 10.5 with additions of ***Caustic Soda*** through the chemical barrel. Use all PPE when mixing ***Caustic Soda.***
- Should well bore conditions dictate, excessive torque, drag, shale: Make the addition of two pounds per barrel ***Sulphonated Asphalt***.
- Adjust mud properties as well bore conditions dictate.
- At total depth, circulate two bottoms and short trip.

Exhibit No. 1
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16,000' – 17,600'

Fluid Type	Cut brine / Xanthan Gum / Pac LV / ***Acid Soluble LCM***
Potential Hazards	Severe lost circulation

16,000' – 17,600'.

Drill a 5 7/8" well bore for open hole completion

Drilling Fluid Recommendations

Interval Depth (feet) (MD TVD)	Fluid Density (Ppg.)	Viscosity (sec/quart)	Plastic Viscosity (cps)	Yield Point (lbs/100 ft.^{2})	pH	Filtrate - API (Cm3/30 min.)	Solids (% volume)	Chloride (mg/l)
16,000' – 17,600'	9.0 – 9.2	32 – 34	6 – 10	4 – 8	10.5	10 – 15	< 5	40k – 90k (*)

(*) Chlorides as $NaCl^-$

16,000' – 17,600'

- Drill out with existing fluid, add fresh water to reduce the weight to 9.0 – 9.2 pounds per gallon.
- Utilize cut brine for fluid additions after that.
- Prior to drilling out, the steel pits should be cleaned and filled with fresh water.
- Adjust with additions of ***Caustic Soda*** to maintain a pH of 10.5. Mix ***Caustic Soda*** in a separate barrel, NOT THE LIME BARREL. ***Use all PPE devices required when mixing Caustic Soda (goggles/face shield, Chemical resistant apron and elbow length gloves. Always use cold or cool water in the chemical barrel never use hot or warm water as this can cause a thermal reaction. This could result in serious injury or even death.***
- Maintain with additions of ***Xanthan Gum*** a 32 – 34 sec/quart viscosity Adjust viscosity as well bore conditions dictate.
- Reduce the filtrate to 10 – 15cc with additions of ***Pac LV***. 0.25 pound per barrel.
- Should seepage be severe, recommend using only acid soluble LCM, such as ***Magma Fiber. Calcium Carbonate*** can also be used, but must be added to mud with a 36 sec/quart viscosity for suspension purposes. Losses could be severe in the Devonian.

Hydraulics program

A good hydraulics program is required to help ensure an in gauge well bore and achieve adequate well bore cleaning and to get maximum penetrations rates from bit selections. This will also help prevent washouts in the shale sections that could cause hole cleaning problems. Recommended flow rate 320 – 350 gallons a minute.