

STATEMENT OF BASIS

Draft Major Modification for Final Permit Renewal

Suckla Farms #1 Underground Injection Well
SENW, 500 feet (ft) from the south line (FSL) and 2020 ft from the west line (FWL),
Section 10, Township 1 North, Range 67 West
Weld County, Colorado

EPA PERMIT NO. CO10938-02115

COMMERCIAL NON-HAZARDOUS
CLASS I DISPOSAL FACILITY

WELD COUNTY, COLORADO

Wattenberg Disposal, LLC
1675 Broadway, Suite 2800
Denver, Colorado 80202

Dated: March 2017

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This STATEMENT OF BASIS gives the derivation of site-specific UIC Permit conditions and reasons for them. Referenced sections and conditions correspond to sections and conditions in the Permit.

EPA UIC permits regulate the injection of fluids into underground injection wells so that the injection does not endanger underground sources of drinking water. EPA UIC permit conditions are based upon the authorities set forth in regulatory provisions at 40 CFR Parts 144 and 146, and address potential impacts to underground sources of drinking water. Under 40 CFR 144.35, issuance of this permit does not convey any property rights of any sort or any exclusive privilege, nor authorize injury to persons or property of invasion of other private rights, or any infringement of other Federal, State or local laws or regulations. Under 40 CFR 144 Subpart D, certain conditions apply to all UIC Permits and may be incorporated either expressly or by reference. General Permit conditions for which the content is mandatory and not subject to site-specific differences (40 CFR Parts 144, 146 and 147) are not discussed in this document.

Upon the Effective Date when issued, the Permit authorizes the construction and operation of injection wells so that the injection does not endanger underground sources of drinking water, governed by the conditions specified in the Permit. The Permit is issued for ten (10) years or unless terminated for reasonable cause under 40 CFR 144.39, 144.40 and 144.41.

The Major Modification contains the following changes:

- Table 2.1 Geological Setting of the Statement of Basis. Identification of the Pierre Shale Formation as both a USDW and other portions as a confining zone.
- Table 2.4 Underground Sources of Drinking Water (USDW) of the Statement of Basis. Identification of portion of the Pierre Shale Formation as a USDW.
- Table 3.1 Well Construction Requirements Suckla Farms Injection Well #1 of the Statement of Basis. The cemented interval has been edited to identify additional depths to which the longstring casing will be perforated to squeeze cement behind pipe.
- Appendix A Construction Procedure of the Permit has been altered to identify the placement of cement behind pipe for the Pierre Shale, Codell, and Niobrara Formations.

PART I. General Information and Description of Facility

Wattenberg Disposal, LLC
1675 Broadway, Suite 2800
Denver, Colorado 80202

on

September 17, 2012

submitted an application for an Underground Injection Control (UIC) Program Permit or Permit Renewal for the following injection well or wells:

Suckla Farms #1 Underground Injection Well
SENW, 500 feet (ft) from the south line (FSL) and 2020 ft from the west line (FWL),
Section 10, Township 1 North, Range 67 West
Weld County, Colorado

The application, including the required information and data necessary to issue or modify a UIC Permit in accordance with 40 CFR Parts 144, 146 and 147, was reviewed and determined by EPA to be administratively complete. The last renewal was issued in December 2014.

This permit is issued for **ten (10) years**, unless terminated. The permit will be reviewed at least every five years to determine whether action under 40 CFR Section 144.36(a) is warranted. It is the Permittee's responsibility to read and understand all provisions of this permit. The permit will **expire at midnight ten (10) years after the effective date of this permit**, or upon delegation of primary enforcement responsibility for the UIC 1422 Program to the State of Colorado, unless that State has adequate authority and chooses to adopt and enforce this permit as a State permit.

EPA has received an application from Wattenberg Disposal, LLC to renew the permit for an underground injection control (UIC) Class I non-hazardous Permit for the existing Suckla Farms #1 Class I injection well located on private property in Weld County, Colorado. This well was initially permitted as a Class I well on June 16, 1992, for a period of 10 years. A renewal was issued on January 22, 2003. The submittal of a complete application prior to expiration of the Permit extends the existing Permit until completion of the re-permitting process and the issuance of a final decision regarding a new Permit (40 CFR 144.37). The applicant proposes to continue to inject a mixture of fluids produced from oil and gas operations and non-hazardous industrial waste into the Lyons Formation between the depths of 9276 feet and 9418 feet. The initial total dissolved solids (TDS) content of the Lyons Formation was approximately 33,000 mg/liter and an aquifer exemption was not required.

This permit application is for continued operation of a Class I non-hazardous well for the disposal of both produced water from oil and gas operations, including gas plants and methane storage operations, and non-hazardous industrial fluids. The industrial fluids will consist of reclaimed water associated with the removal of underground fuel storage tanks, pit water from oil field wash pits,

contaminated surface water from construction sites, and other non-hazardous fluids. Fluids are anticipated to be from the Front Range area as far south as Pueblo, Colorado. The average injection pressure is anticipated to be 900 pounds per square inch gauge (psig) with an average injection rate of around 1700 barrels of water per day (BWPD). The maximum injection pressure will be limited to 3700 psig.

The top of the injection zone, the Lyons Formation, is located at a depth of about 9274 feet (ft) KB and extends to 9422 ft KB. The perforated interval extends from 9276 ft to 9418 ft. The Lyons is a massive crossbedded sandstone with fine to coarse grains.

The Suckla Farms injection well is located in a portion of the Spindle Field adjacent to the Weld County Road 19.

TABLE 1.1 shows the status of the well or wells as "New", "Existing", or "Conversion" and for Existing shows the original date of injection operation. Well authorization "by rule" under 40 CFR Part 144 Subpart C expires automatically on the Effective Date of an issued UIC Permit.

**TABLE 1.1
WELL STATUS / DATE OF OPERATION**

Well Name	Well Status	Date of
Suckla Farms #1	Existing	07/12/1989

The Suckla Farms #1 well was first completed on July 12, 1989. The Suckla Farms #1 injection well was originally issued a permit for the purpose of disposal on July 21, 1992. A renewal final permit was issued on January 22, 2003. This is a permit to issue a second renewal to continue injection activities.

PART II. Permit Considerations (40 CFR 146.24)

Geologic Setting (TABLE 2.1)

**TABLE 2.1
GEOLOGIC SETTING
SUCKLA FARMS INJECTION WELL #1**

FORMATION NAME	GEOLOGICAL DESCRIPTION	TOP DEPTH, ft	BOTTOM DEPTH, ft	TDS mg/l	ZONE TYPE
Arapahoe	Sandstone, siltstone, and shale	350		< 10,000 mg/l	USDW
Laramie	Sandstone, mudstone, clay and coal	unknown		< 10,000 mg/l	USDW

Fox Hills	Sandstone, siltstone and shale	650		< 10,000 mg/l	USDW
Pierre Shale	Shale	700			Upper Portion is a USDW and remainder is a Major confining zone
Niobrara Shale	Shale	7362			Confining zone
Codell	Silty, shaley and fine-grained sandstone	7694		unknown	Geological Setting
J Sand	Sandstone, Siltstones and shale	8133		unknown	Geological Setting
Dakota Sandstone	Sandstone and shale	8281		unknown	Geological Setting
Lakota Sandstone	Sandstone	8368		unknown	Geological Setting
Morrison	Mudstone, sandstone, siltstone, and limestone	8404			Confining zone
Entrada	Sandstone	8562		unknown	Geological Setting
Harriman Shale (Forell)	Shale	9069	9139		Confining zone
Blaine Salt	Anhydrite and Shale	9143	9274		Confining Zone
Lyons Sandstone	Sandstone	9274	9422	33,000 mg/l	Injection zone
Santanka Shale	Shale	9422			Confining zone

The Suckla Farms #1 Class I disposal well is located about 25 miles North of Denver, Colorado in the Denver-Julesburg Basin. The Denver-Julesburg Basin is a north-south trending “trough” or asymmetrical Syncline. Strata which are exposed along the Front Range dip steeply eastward. On the east flank of the Basin, the strata dip gently westward. The well is located approximately 5 to 10 miles east of the axis of the Basin where the thickness of the sedimentary section is near its maximum. Formation top depths listed above were obtained from the Well Completion Report for the Suckla Farms #1 well dated July 13, 1989 and page 4 of the permit application. Additional geological data was obtained from the permittee regarding the depths of the Blaine Salt and Lyons Sandstone formations. The designation of USDWs and non-USDWs data has been obtained from page 4 of the application and from the 2003 Statement of Basis for the Final Renewal Permit issued for the Suckla Farms #1 well.

Proposed Injection Zone(s) (TABLE 2.2)

An injection zone is a geological formation, group of formations, or part of a formation that receives fluids through a well. The proposed injection zones are listed in TABLE 2.2.

Injection will occur into an injection zone that is separated from USDWs by a confining zone which is free of known open faults or fractures within the Area of Review.

**TABLE 2.2
INJECTION ZONES
SUCKLA FARMS INJECTION WELL #1**

Formation Name	Top (ft)	Base (ft)	TDS (mg/l)	Fracture Gradient (psi/ft)	Porosity	Exempted?*
Lyons Sandstone	9274	9422	33,000	0.8415	0.06	N/A

- C - Currently Exempted**
- E - Previously Exempted**
- P - Proposed**

The targeted portion of the Lyon injection zone is the sandstone unit encountered at about 9276 ft. The Lyons Sandstone is a massive cross bedded sandstone with fine to coarse grains with some cementing. The perforated interval of the Lyons is from 9276 ft to 9418 ft. The injection zone is expanded to depths between 9274 ft to 9422 ft. to accommodate depths within the Lyons Sandstone that are perforated and sandstones which may store fluid. The depths were determined by the permittee.

As indicated above, the disposal of oil field related fluids and non-hazardous fluids will be into the Lyons Sandstone. The Suckla Farms #1 was sampled and analyzed prior to conversion to a Class I injection well and reservoir fluid contained about 33,000 mg/liter total dissolved solids (TDS).

Confining Zone(s) (TABLE 2.3)

A confining zone is a geological formation, part of a formation, or a group of formations that limits fluid movement above the injection zone. The confining zone or zones are listed in TABLE 2.3

**TABLE 2.3
CONFINING ZONES**

FORMATION NAME	GEOLOGICAL DESCRIPTION	TOP DEPTH, ft	BOTTOM DEPTH, ft	TDS, mg/l	ZONE TYPE
Blaine Salt	Anhydrite and shale	9143	9274	N/A	Upper Confining zone
Santanka Shale	Shale	9422		N/A	Lower Confining zone

The upper confining zone is the Blaine Salt and is encountered at 9143 ft. The Santanka Shale serves as the lower confining zone and is encountered at a depth of 9422 ft.

Underground Sources of Drinking Water (USDWs) (TABLE 2.4)

Aquifers or the portions thereof which contain less than 10,000 mg/l total dissolved solids (TDS) and are being or could in the future be used as a source of drinking water are considered to be USDWs. The USDWs in the area of this facility are identified in TABLE 2.4.

**TABLE 2.4
UNDERGROUND SOURCES OF DRINKING WATER (USDW)**

FORMATION NAME	GEOLOGICAL DESCRIPTION	TOP DEPTH, ft	BOTTOM DEPTH, ft	TDS mg/l	ZONE TYPE
Arapahoe	Sandstone, siltstone, and shale	350		<10,000 mg/l	USDW
Laramie	Sandstone, mudstone, clay and coal			<10,000 mg/l	USDW
Fox Hills	Sandstone, siltstone and shale	650		<10,000 mg/l	USDW
Pierre Shale	Sandstone	700	885	<10,000 mg/l	USDW

In this area, the principal aquifers used for public and domestic and other uses are the Arapahoe Formation and the Laramie-Fox Hills aquifer system. These major USDWs overlie the Pierre Shale, which is a major confining unit in the basin, and is approximately 6600 feet thick. The Pierre is principally 6600 feet thick. The Pierre is principally a dark gray marine shale, but sand lenses, such as the Hygiene sand and the Wellington sand do occur in places. The upper portion of the Pierre Shale is used to recover water for domestic use and is considered a USDW.

The Hygiene and the Wellington sands often contain water with a quality and quantity sufficient to be defined as a USDW. All the formations underlying the Pierre are not USDWs because they contain water with a TDS of greater than 10,000 mg/liter. The injected interval, prior to injection, contained water with a TDS of approximately 33,000 mg/liter.

PART III. Well Construction (40 CFR 146.22)

TABLE 3.1
WELL CONSTRUCTION REQUIREMENTS
SUCKLA FARMS INJECTION WELL #1

Casing Type	Hole Size (in)	Casing Size (in)	Cased Interval (ft)	Cemented Interval (ft)
Surface	12 ¼	8 5/8	0 – 759	0 – 759
Longstring	5 ½	7 7/8	0 – 9557	next line
New cemented intervals: 759-935 ft; 4500-4600 ft; 4700-5100 ft; 5200-5400 ft; and 7100-8406 ft				
Existing cemented intervals: 4600-4784 ft; 5150-5264 ft; and 8406-9571 ft				

The approved well completion plan will be incorporated into the Permit as APPENDIX A and will be binding on the Permittee. Modification of the approved plan is allowed under 40 CFR 144.52(a)(1) provided written approval is obtained from the Director prior to actual modification.

Casing and Cementing (TABLE 3.1)

The well construction plan was evaluated and determined to be in conformance with standard practices and guidelines that ensure well injection does not result in the movement of fluids into USDWs. Well construction details for this "new" injection well is shown in TABLE 3.1.

Remedial cementing may be required if the casing cement is shown to be inadequate by cement bond log or demonstration of Part II (External) mechanical integrity.

The Suckla Farm #1 well is constructed in a manner which incorporates special completion (cementing) requirements identified under 40 CFR Section 147.305. Requirements for all wells. These special requirements are implemented to protect USDWs.

Tubing and Packer

Injection tubing is required to be installed from a packer up to the surface inside the well casing. The packer will be set above the uppermost perforation. The tubing and packer are designed to prevent injection fluid from coming into contact with the outermost casing.

Approximately 9254 ft of 2 7/8 inch tubing is presently set in the well with the packer being located approximately 36 ft above the uppermost perforation, 9276 ft KB. Tubing and packer depths shall be maintained within the identified depths mentioned earlier or within a depth of no more than 100 ft. of the top perforation.

Tubing-Casing Annulus (TCA)

The TCA allows the casing, tubing and packer to be pressure-tested periodically for mechanical integrity, and will allow for detection of leaks. The TCA will be filled with fresh water treated with a corrosion inhibitor or other fluid approved by the Director.

The annulus pressure shall be maintained at a positive pressure between one hundred (100) and two hundred (200) psi gauge as measured at the wellhead.

If this pressure cannot be maintained between 100 psig and 200 psig, the Permittee shall follow the procedures listed in Ground Water Guidance No. 35 "Procedures to follow when excessive annular pressure is observed on a well." The annulus pressure is determined to be appropriate because the temperature difference between the injection fluid and the temperature formation causes the temperature in the annulus to rise above the normal 0 psig required value.

Monitoring Devices

The permittee will be required to install and maintain wellhead equipment that allows for monitoring pressures and providing access for sampling the injected fluid. Required equipment may include but is not limited to: 1) shut-off valves located at the wellhead on the injection tubing and on the TCA; 2) a flow meter that measures the cumulative volume of injected fluid; 3) fittings or pressure gauges attached to the injection tubing and the TCA for monitoring the injection and TCA pressure; and 4) a tap on the injection line, isolated by shut-off valves, for sampling the injected fluid.

All sampling and measurement taken for monitoring must be representative of the monitored activity.

The applicant shall be required to monitor the maximum injection pressure and record results in accordance with the conditions of the permit's appendix D. An inspector will perform visual inspections of the well, pressure levels, ground surface, and well head.

The monitoring devices shall continuously monitor: (1) injection pressure; (2) casing head pressure of the tubing/casing annular space; and (3) flow rate and volume. The tubing/casing annulus is to be filled with fluid and maintained between a positive pressure of 100 - 200 psig. This may be achieved through the use of an above-ground fluid reservoir with a gas cap of nitrogen to maintain the positive pressure. A continuous recording of injection volume can be accomplished by use of a cumulative volume totalizer.

The permittee shall provide and maintain in good operating condition: a ½ inch fitting with a cut-off valve at the wellhead on the tubing, and a similar fitting and cut-off valve for the casing/tubing annulus. These valves shall be positioned to allow the attachment of pressure gauges certified for ninety-five (95) percent accuracy, or better, throughout the range of permitted operation, in order to monitor the injection and annulus fluid pressures. A flow meter shall be installed near the wellhead to measure cumulative volumes of injected fluid. These gauges will serve as a check against the readings recorded by the continuous monitoring devices. EPA is further requiring that a sampling tap exist on the line to the disposal well.

PART IV. Area of Review, Corrective Action Plan (40 CFR 144.55)

According to the information provided, there are no wells within the 1/4 mile area of review which penetrates the Lyons Formation.

**TABLE 4.1
AOR AND CORRECTIVE ACTION**

Well Name/Permit No. Required (Y/N)	Type	Status (Abandoned Y/N)	Total	TOC Depth (ft)	CAP Depth (ft)
49627-MH	Monitoring	No	30	unknown	No
45567	Domestic/Stock	No	450	unknown	No
90356-VE	Domestic	No	740	unknown	No
39799-MH	Monitoring	No	25	unknown	No
47236-MH	Monitoring	No	25	unknown	No
49186-MH	Monitoring	No	15	unknown	No

TABLE 4.1 lists the wells in the Area of Review ("AOR") and shows the well type, operating status, depth, top of casing cement ("TOC") and whether a Corrective Action Plan ("CAP") is required for the well.

The applicant identified ninety-six (96) oil and gas wells which are located within a one (1) mile radius of the Suckla Farms #1 well. These oil and gas wells range in total depth from 4810 ft to 8700 ft. None of the oil and gas wells penetrate the upper confining zones nor do they penetrate the injection zone.

There are fifty-four (54) water wells that are located within a one mile radius of the Suckla Farms #1 well. These water wells extend from a depth of 10 ft to 788 ft. None of the water wells penetrate the upper confining zones or the injection zone. There are several hundreds of feet of confinement (tight geology) which exists between the lowermost water well and the injection zone.

Area of Review

Applicants for Class I, II (other than "existing" wells) or III injection well Permits are required to identify the location of all known wells within the injection well's Area of Review (AOR) which penetrate the injection zone, or in the case of Class II wells operating over the fracture pressure of the formation, all known wells within the area of review that penetrate formations which may be affected by increased pressure. Under 40 CFR 146.6 the AOR may be a fixed radius of not less than one quarter (1/4) mile or a calculated zone of endangering influence.

Corrective Action Plan

For wells in the AOR which are improperly sealed, completed, or abandoned, the applicant shall develop a Corrective Action Plan (CAP) consisting of the steps or modifications that are necessary to prevent movement of fluid into USDWs.

The CAP will be incorporated into the Permit as APPENDIX F and become binding on the permittee.

No corrective action activities were identified for this action.

PART V. Well Operation Requirements (40 CFR 146.23)

**TABLE 5.1
INJECTION ZONE PRESSURES**

Formation Name	Depth Used to Calculate	Fracture Gradient (psi/ft)	Specific Gravity	MAIP (psig)
Lyons Formation	9276 ft	0.8415	1.022	3700

An MAIP of 3700 psig was the highest value observed during a 1993 step rate test with no breaking point (formation fracturing pressure) observed. Therefore, no formation breakdown of the Lyons injection zone occurred up to the termination of the test at a surface injection pressure of 3700 psig and at an injection rate of 8.0 barrels of water per minute.

Approved Injection Fluid

The approved injection fluid is limited to produced oil field waters, as authorized under the provisions of the previously issued Class II permit, plus nonhazardous industrial waste fluids, as provided for in this Class I permit.

The injectate has the following characteristics:

<i>SUSSEX FORMATION SOURCE WATER</i>	<i>SPECIFIC GRAVITY</i>	<i>TDS, mg/l</i>
<i>Spindle Field produced water</i>	<i>1.02</i>	<i>13,800</i>
<i>produced water</i>	<i>1.017</i>	<i>11,065</i>
<i>Suckla Brown Unit</i>	<i>1.022</i>	<i>12,860</i>

Injection Pressure Limitation

Injection pressure, measured at the wellhead, shall not exceed a maximum calculated to assure that the pressure used during injection does not initiate new fractures or propagate existing fractures in the confining zones adjacent to the USDWs.

The applicant submitted injection fluid density and injection zone data which was used to calculate a formation fracture pressure and to determine the maximum allowable injection pressure (MAIP), as measured at the surface, for this Permit.

TABLE 5.1 lists the fracture gradient for the injection zone and the approved MAIP, determined according to the following formula:

$$FP = [fg - (0.433 * sg)] * d$$

- FP = formation fracture pressure (measured at surface)
- fg = fracture gradient (from submitted data or tests)
- sg = specific gravity (of injected fluid)
- d = depth to top of injection zone (or top perforation)

- $fg = 0.8415$ psi/ft
- $sg = 1.022$
- $d = 9276$ ft (top perforations in the Lyons Sandstone injection zone)
- $FP = 3700$ psig

A Step Rate Test was performed on July 9, 1993. This test was performed on the Lyons injection interval between the depths of 9,276 ft – 9,418 ft in the Suckla Farms #1 well. The operator will need to perform additional tests, including a new Step Rate Test should they request the installation of new perforations or to request an increase in pressure (MAIP). Using the calculation above, the fracture pressure was determined to be 3700 psig.

Injection Volume Limitation

Cumulative injected fluid volume limits are set to assure that injected fluids remain within the boundary of the exempted area. Cumulative injected fluid volume is limited when injection occurs into an aquifer that has been exempted from protection as a USDW.

The injection volume is recorded in Appendix E of the Permit. Cumulative injection volume of oil field water, plus nonhazardous waste fluid will be limited to 8,300,000 barrels over the life of the well unless EPA decides to extend the limits of the injection zone or to terminate the permit. This volume was calculated using the formula shown below, which indicates the amount of fluid required to fill up the portion of the reservoir within a ¼ mile radius around the injection well.

$$V = (\pi r^2 hn) / 5.615 \quad \text{where}$$

$\pi = 3.14159265$
 $r = 1320$ ft or ¼ mile = radial distance
 $h = 142$ ft = height of injection zone available for fill up (ft)
 $n = 0.06$ = porosity of injection zone (decimal percent)
 5.615 = conversion factor (barrels and ft³)
 $V = 8,300,000$ barrels = maximum cumulative volume (bbl)

Mechanical Integrity (40 CFR 146.8)

An injection well has mechanical integrity if:

1. there is no significant leak in the casing, tubing, or packer (Part I); and
2. there is no significant fluid movement into a USDW through vertical channels adjacent to the injection well bore (Part II).

The Permit prohibits injection into a well which lacks mechanical integrity.

The Permit requires that the well demonstrate mechanical integrity prior to injection and periodically thereafter. A demonstration of mechanical integrity includes both internal (Part I) and external (Part II). The methods and frequency for demonstrating Part I and Part II mechanical integrity are dependent upon well-specific conditions as explained below.

The applicant is required to perform a Part I and Part II MIT as follows:

- *Part I, Shall be performed **at least every five (5) years** after the last successful demonstration of Mechanical Integrity.*
- *Part II, Shall be performed **at least every five (5) years** after the last successful demonstration of Mechanical Integrity. Federal regulation 40 CFR 146.8(c)1 requires the absence of significant fluid be determined with either a temperature or noise log. Therefore, a temperature log with a supplemental radioactive tracer survey may be used to perform Part II (External) Mechanical Integrity Testing.*

The applicant shall perform tests as follows:

- *With a Temperature Logs or a noise log or*
 - *With a Temperature Log and supplemental Radioactive Tracer Survey (see Appendix H of the Permit for Test Procedures.*
- *Pressure Fall Off Tests with pore pressure data shall be performed annually following the last successful Pressure Fall Off Test as approved/accepted by the EPA Region 8 office.*

PART VI. Monitoring, Recordkeeping and Reporting Requirements

Injection Well Monitoring Program

At least once a year the permittee must analyze a sample of the injected fluid for total dissolved solids (TDS), specific conductivity, pH, and specific gravity. This analysis shall be reported to EPA quarterly as part of the Quarterly Report to the Director. Any time a new source of injected fluid is added, a fluid analysis shall be made of the new source.

Instantaneous injection pressure, injection flow rate, cumulative fluid volume and TCA pressures must be observed on a weekly basis. A recording, at least once every thirty (30) days, must be made of the injection pressure, injection flow rate and cumulative fluid volume, and the maximum and average value for each must be determined for each month. This information is required to be reported quarterly as part of the Quarterly Report to the Director.

All industrial waste fluids delivered to the facility will be sampled for fluid analysis prior to delivery, or prior to being transferred to an on-site 500 barrel storage tanks. These fluid samples shall be analyzed for chemical, physical, radiological, and biological constituents, including pH and conductivity. If the analyses of several loads from the same source indicate little or no change, the Director may elect to waive the requirement that each load be sampled. However, one load of industrial waste coming from the same source (where the process is not likely to change) must be tested each month prior to being transferred to on-site tanks.

A flow meter will measure the quantity of fluids pumped from the storage tanks to the injection system. The commingled fluids will be sampled for analysis at random, but not less than once every three months. This final analysis shall include a determination of total dissolved solids, pH, specific gravity, specific conductivity, major cations and anions, oil and grease, and total organic carbon.

The permittee requires that the average, maximum, and minimum monthly values of injection pressure, flow rate and volume, and annular pressure be reported quarterly, along with the data from fluid analyses. In addition to routine quarterly reporting, the permittee is required to report the results of any mechanical integrity test, well workover, logging, or testing of the well or injection zone. These reports are due within sixty (60) days of the completion of the activity, or at the time of the next scheduled quarterly report, whichever is sooner.

Seismicity data has been included to ensure that EPA is informed of any seismic occurrences in the area. Pore pressure data will be collected to determine if pressure has risen in the proposed location. This information will be used to determine what next steps may be required as a result of recent seismic activities.

PART VII. Plugging and Abandonment Requirements (40 CFR 146.10)

Plugging and Abandonment Plan

Prior to abandonment, the well shall be plugged in a manner that isolates the injection zone and prevents movement of fluid into or between USDWs, and in accordance with any applicable Federal, State or local law or regulation. Tubing, packer and other downhole apparatus shall be removed. Cement with additives such as accelerators and retarders that control or enhance cement properties may be used for plugs; however, volume-extending additives and gel cements are not approved for plug use. Plug placement shall be verified by tagging. Plugging gel of at least 9.6 lb/gal shall be placed between all plugs. A surface plug shall be set inside and outside of the surface casing to seal pathways for fluid migration into the subsurface. Within sixty (60) days after plugging the owner or operator shall submit Plugging Record (EPA Form 7520 13) to the Director. The Plugging Record must be certified as accurate and complete by the person responsible for the plugging operation. The plugging and abandonment plan is described in Appendix C of the Permit.

PART VIII. Financial Responsibility (40 CFR 144.52)

Demonstration of Financial Responsibility

The permittee is required to maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner prescribed by the Director. The permittee shall show evidence of such financial responsibility to the Director by the submission of a surety bond, or other adequate assurance such as financial statements or other materials acceptable to the Director. The Regional Administrator may, on a periodic basis, require the holder of a lifetime permit to submit a revised estimate of the resources needed to plug and abandon the well to reflect inflation of such costs, and a revised demonstration of financial responsibility if necessary. Initially, the operator has chosen to demonstrate financial responsibility with:

A demonstration of Financial Responsibility in the amount of \$84,852 has been provided.

The Director may revise the amount required, and may require the permittee to obtain and provide updated estimates of costs for plugging the well according to the approved Plugging and Abandonment Plan.

Evidence of continuing financial responsibility is required to be submitted to the Director annually.

PART IX. Considerations Under Federal Law (40 CFR § 144.4)

EPA has determined that issuance of Permit Number CO10938-02115 for the Suckla Farms Injection Well #1 is in compliance with the laws, regulations, and orders described at 40 C.F.R. § 144.4, including the National Historic Preservation Act (NHPA) and the Endangered Species Act (ESA).