FINAL

UTAH DIVISION OF WATER QUALITY

CLASS III AREA PERMIT

UNDERGROUND INJECTION CONTROL (UIC) PROGRAM

UIC Permit Number: UTU-27-AP-718D759

Millard County, Utah

Original Permit Issued to:

Magnum Solution Mining, LLC
3165 East Millrock Drive, Suite 330
Holladay, Utah 84121

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Attachment A - General Location Map of the Magnum Gas Storage Project, Millard County.

Attachment B - Map of the Magnum Gas Storage Project Area of Review including the Class III Solution Mining Injection Wells and the Project Area

Attachment C - Corrective Action Plan for Artificial Penetrations into Injection Zone within Area of Review

Attachment D - Construction and Cavern Development Plan

Attachment E - Monitoring, Recording, and Reporting Plan

Attachment F - Well and Cavern Closure and Abandonment Plan

Attachment G - Financial Responsibility

PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Utah Underground Injection Control (UIC) Program Regulations codified in the Utah Administrative Code (UAC) R317-7,

Magnum Solution Mining, LLC (Magnum)
3165 East Millrock Drive, Suite 330
Holladay, Utah 84121

is hereby authorized to construct and operate Class III solution mining injection wells in a Project Area centered approximately at 39° 29' 39" latitude 112° 36' 20" longitude, NAD83, located in the S 1/2 of Sec. 23 and the N 1/2 of Sec. 26, T 15 S, R 7 W; SLB&M in Millard County, Utah. A general location map is included as Attachment A.

The intent of the solution mining activity to be conducted under this permit is to create underground hydrocarbon storage (natural gas) caverns in a salt deposit that has been tectonically thickened. This permit implements requirements, as established by the state and federal UIC regulations, for constructing the wells; logging and testing the wells; establishing and maintaining mechanical integrity of the wells and caverns; monitoring, recording and reporting; well and cavern closure and abandonment; and financial assurance to cover closure. Regulatory authority for each of these activities is shared, to varying degrees, with the Utah Division of Oil, Gas and Mining (DOGM). However, once the underground hydrocarbon storage caverns are developed to their full permitted capacity and employed in storing product, the operation of the storage caverns will be regulated by DOGM in accordance with a DOGM Board Order issued to Magnum. Details of the shared regulatory authority during well/cavern construction and development and transfer of regulatory authority from DWQ to DOGM for operation of each well/cavern system for product storage will be captured in a Memorandum of Understanding (MOU) between the two agencies

According to the Solution Mining Plan submitted in the Technical Report of the permit application, each natural gas (NG) storage cavern will have a maximum permitted capacity of 10,500,000 barrels of open cavern volume corresponding to a NG storage capacity of 9.8 million barrels. The final cemented casing will be set at a depth of no less than 200 feet below the top of the salt structure, and the roof of the cavern will be established at a depth no less than 200 feet below the setting depth of the last cemented casing. The maximum diameter of each NG cavern is intended to be 300 feet and the open height approximately 1,000 feet

The Project Area, defined in the permit application, is located west of the intersection of Highway 174, also known as Brush-Wellman Road, and Jones Road; approximately 3 ½ miles east-northeast of Sugarville, Utah and 9 miles north of Delta, Utah. The Project Area is the surface projection of the maximum extent within the salt structure in which caverns can be created. The western boundary of the Project Area is defined "by the surface projection of a main north-south trending fault identified at a depth of 3,000 feet during seismic testing and the drilling of exploratory well MH-1." The southern and eastern boundaries are defined "by the downward dip of the salt structure at 3,000 feet." The northern boundary is defined by "a desired offset [of the Project Area] from existing and future high voltage power lines paralleling Brush-

Wellman Road." A map showing the facility property boundary, the Project Area, and Area of Review, and the proposed injection wells is included as Attachment B.

The legal description of the Project Area within which the construction of Class III solution mining wells may occur follows:

> Commencing at Southeast comer of Section 22; Township 15 South, Range 7 West, Salt Lake Meridian; thence North 00°18'23" East 1013.34 feet along section line to the POINT OF BEGINNING; thence North 89°29'53" West 79.82 feet: thence North 00°34'02" East 72.17 feet; thence South 89°12'14" East 79.50 feet to a point on section line: thence continuing in Section 23. T15S, R7W, SLM, South 89°12'14- East 1526.73 feet; thence South 65°47'14" East 1136.22 feet; thence South 68°08'46" East 689.53 feet; thence South 68°41'17" East 1031.29 feet to a point on section line; thence continuing in Section 26, T15S R7W, SLM, South 68°41'17" East 118.41 feet; thence South 55°03'23" West 505.26 feet; thence South 64°01'29" West 334.36 feet; thence South 58°24'51" West 561.50 feet; thence South 64°16'48" West 684.14 feet; thence South 62°14'43" West 328.65 feet: thence South 67°45'22" West 770.54 feet; thence South 72°08'22" West 759.72 feet to a point on a non-tangent curve to the right having a radius of 4216.45 feet and a chord that bears North 26°42'40" West 1213.46 feet; thence along said curve a distance of 1217.68 feet; thence South 89°49'44" East 143.09 feet to a curve to the left having a radius of 174.52 feet, a central angle of 28°05'46" and a chord that bears North 76°07'23" East 84.72 feet; thence along said curve a distance of 85.58 feet; thence North 51°04'47" East 634.33 feet; thence North 49°28'54" East 124.07 feet; thence North 00°00'36" West 189.98 feet to a point on section line; thence continuing in said Section 23, North 00°00'36" West 408.91 feet: thence North 00°47'08" West 300.00 feet; thence South 89°42'45" West 765.98 feet; thence North 00°00'16" East 314.50 feet: thence North 89°29'53" West 235.29 feet to the POINT OF BEGINNING. Contains 6145316 square feet or 141.077 acres, more or less.

All references to UAC R315-2-3, UAC R317-7, and to Title 40 of the Code of Federal Regulations (40 CFR) are to all regulations that are in effect on the date this permit modification becomes effective. The following are incorporated as enforceable attachments to this permit:

- Attachment A - General Location Map of the Magnum Gas Storage Project, Millard County.
- Attachment B - Map of the Magnum Gas Storage Project Area of Review including the Class III Solution Mining Injection Wells and the Project Area
- Attachment C - Corrective Action Plan for Artificial Penetrations into Injection Zone within Area of Review
- Attachment D - Construction and Cavern Development Plan
- Attachment E - Monitoring, Recording, and Reporting Plan
- Attachment F - Well and Cavern Closure and Abandonment Plan
- Attachment G - Financial Responsibility

This major modification of the original permit is based upon representations made by the permittee and other information contained in the administrative record. **It is the responsibility of the permittee to read and understand all provisions of this permit.**

Any person who violates the Utah Water Quality Act (UWQA), or any permit, rule, or order adopted under it, is subject to the provisions of section UCA 19-5-115 of the UWQA governing violations.
This permit shall become effective **September 26, 2014**

This permit and the authorization to inject shall be issued for the life of the project as described in Part III A – Duration of Permit of this permit unless terminated.

Walter L. Baker, P.E.
Director
Utah Division of Water Quality

This major modification of the original permit is based upon representations made by the permittee and other information contained in the administrative record. **It is the responsibility of the permittee to read and understand all provisions of this permit.**

Any person who violates the Utah Water Quality Act (UWQA), or any permit, rule, or order adopted under it, is subject to the provisions of section UCA 19-5-115 of the UWQA governing violations.
This permit shall become effective **September 26, 2014**

This permit and the authorization to inject shall be issued for the life of the project as described in Part III A – Duration of Permit of this permit unless terminated.

Walter L. Baker, P.E.
Director
Utah Division of Water Quality

PART II. GENERAL PERMIT CONDITIONS

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. The permittee, authorized by this permit, shall not construct, operate, maintain, convert, plug, abandon or conduct any other injection activity in a manner that allows the movement of fluid containing any contaminant into underground sources of drinking water (USDW), if the presence of that contaminant may cause a violation of any primary drinking water standard under the Utah Public Drinking Water Administrative Rules, UAC R309-200 and 40 CFR Part 141, or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit is prohibited unless otherwise authorized-by-rule or by another UIC permit. Compliance with this permit does not constitute a defense to any action brought under the Utah Water Quality Act (UWQA) Title 19, Chapter 5 Utah Code Annotated 1953, or any other common or statutory law or regulation. Issuance of this permit does not authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable regulations.

B. SEVERABILITY

The provisions of this permit are severable. If any provision of this permit or the application of any provision of this permit to any circumstance is held to be invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

C. CONFIDENTIALITY

In accordance with Utah Code 19-1-306 (Records of the Department of Environmental Quality), Utah Code 63G-2-309 (Confidentiality Claims), and Utah Code 19-5-113 (DWQ Records and Reports Required by Owners/Operators) any information deemed by the permittee to be entitled to trade secret protection submitted to the DWQ pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "Confidential Business Information" on each page containing such information. If no claim is made at the time of submission, the DWQ may make the information available to the public without further notice. Claims of confidentiality may be denied by the DWQ according to the procedures detailed in Utah Code 63G-2 and the federal Freedom of Information Act (FOIA). Claims of confidentiality for the following information will be denied as per UAC R317-7-9.7:

1. The name and address of the permittee.

2. Information that deals with the existence, absence or level of contaminants in drinking water.

D. CONDITIONS APPLICABLE TO ALL UIC PERMITS (40CFR144.51)[1]

The following conditions are required for all Class III permits. Specific requirements for implementing these conditions are included in Part III of this permit, as necessary.

1. Duty to Comply (40CFR144.51(a))

   The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and the UWQA and is grounds for enforcement action, permit termination, revocation and re-issuance, modification; or for denial of a permit renewal application; except that the permittee need not comply with the provisions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit issued in accordance with UAC R317-7-8 (40 CFR 144.34). Such noncompliance may also be grounds for enforcement action under the Utah Solid and Hazardous Waste Act (USHWA), Title 19, Chapter 6, Utah Code Annotated 1979.

2. Duty to Reapply (40CFR144.51(b))

   If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The permittee shall submit a complete permit renewal application at least 180 days before this permit expires. While Class III permits are typically issued for the life of the project, unforeseen circumstances may require the permittee to reapply for a permit. Class III well permits shall be reviewed by the Director at least once every five years to determine whether it should be modified, revoked and reissued, or terminated.

3. Need to Halt or Reduce Activity Not a Defense (40CFR144.51(c))

   It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

4. Duty to Mitigate (40CFR144.51(d))

   The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

5. Proper Operation and Maintenance (40CFR144.51(e))

   The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and

[1] Parenthetical references to the Code of Federal Regulations (CFR) and / or the Utah Administrative Code (UAC) for the UIC Program indicate the requirement for inclusion in the permit.

process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

6. Permit Actions (40CFR144.51(f), 40 CFR 124.5, 40 CFR 144.38, 40 CFR 144.39, 40 CFR 144.40, 40 CFR 144.41)

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the permittee) or upon the Director's initiative. However, permits may only be modified, revoked and reissued, or terminated for the reasons specified in sections a) and b) below. All requests shall be in writing and shall contain facts or reasons supporting the request. The filing of a request for a permit modification, revocation and re-issuance, or termination on the part of the permittee, does not stay any permit condition. This permit may be transferred according to the procedures given in section d).

a) Modify or Revoke and Re-Issue Permits

When the Director of the Utah Division of Water Quality (hereafter referred to as 'the Director') receives any information (for example, inspects the facility, receives information submitted by the permittee as required in the permit, receives a request for modification or revocation and reissuance, or conducts a review of the permit file), the Director may determine whether or not one or more of the causes listed in paragraphs (1) and (2) of this section for modification or revocation and reissuance or both exist. If cause exists, the Director may modify or revoke and reissue the permit accordingly, subject to the limitations of paragraph (3) of this section, and may request an updated application if necessary. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term. If cause does not exist under this section a) or under section c) for minor modifications, the Director shall not modify or revoke and reissue the permit. If a permit modification satisfies the criteria for minor modifications in section c) the permit may be modified without a draft permit or public review. Otherwise, a draft permit must be prepared and other procedures in 40 CFR 124, incorporated by reference into the Utah UIC Program rules (hereafter referred to as '40 CFR 124'), must be followed.

(1) Causes for modification. For Class III wells the following may be causes for revocation and reissuance as well as modification.

i. Alterations. There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.

ii. Information. The Director has received information. For UIC area permits, this cause shall include any information indicating that cumulative effects on the environment are unacceptable.

iii. New regulations. The standards or regulations on which the permit was based have been changed by promulgation of new or amended standards or regulations or by judicial decision after the permit was issued.

iv. Compliance schedules. The Director determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy. See also paragraph (3) under section c) – Minor Modification of Permit).

(2) Causes for modification or revocation and reissuance. The following are causes to modify or, alternatively, revoke and reissue a permit:

i. Cause exists for termination under section b), and the Director determines that modification or revocation and reissuance is appropriate.

ii. The Director has received notification (as required in the permit, see paragraph (4) under section c) – Minor Modification of Permit) of a proposed transfer of the permit. A permit also may be modified to reflect a transfer after the effective date of an automatic transfer (see paragraph (2) of section d) – Transfer of Permit) but will not be revoked and reissued after the effective date of the transfer except upon the request of the new permittee.

iii. A determination that the waste being injected is a hazardous waste as defined in 40 CFR 261.3 either because the definition has been revised, or because a previous determination has been changed.

(3) Facility siting. Suitability of the facility location will not be considered at the time of permit modification or revocation and reissuance unless new information or standards indicate that a threat to human health or the environment exists which was unknown at the time of permit issuance.

b) Termination of Permit

(1) The Director may terminate a permit during its term, or deny a permit renewal application for the following causes:

i. Noncompliance by the permittee with any condition of the permit;

ii. The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time; or

iii. A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination;

(2) The Director shall follow the applicable procedures in 40 CFR 124 in terminating any permit under this section.

c) Minor Modification of Permit

Upon the consent of the permittee, the Director may modify a permit to make the corrections or allowances for changes in the permitted activity listed in this section, without following the procedures of 40 CFR 124. Any permit modification not processed as a minor modification under this section must be made for cause and with 40 CFR 124 draft permit and public notice as required in section a). Minor modifications may only:

(1) Correct typographical errors;

(2) Require more frequent monitoring or reporting by the permittee;

(3) Change an interim compliance date in a schedule of compliance, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement; or

(4) Allow for a change in ownership or operational control of a facility where the Director determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittees has been submitted to the Director.

(5) Change quantities or types of fluids injected which are within the capacity of the facility as permitted and, in the judgment of the Director, would not interfere with the operation of the facility or its ability to meet conditions described in the permit and would not change its classification.

(6) Change construction requirements approved by the Director pursuant to 40 CFR 144.52(a)(1) (establishing UIC permit conditions), provided that any such alteration shall comply with the requirements of 40 CFR 144 and 40 CFR 146.

(7) Amend a plugging and abandonment plan which has been updated.

d) Transfer of Permit

(1) Transfers by Modification. Except as provided in paragraph (2) of this section, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under paragraph (2)(ii) under section a)), or a minor modification made (under paragraph (4) of section c)) to identify the new permittee and incorporate such other requirements as may be necessary under the Safe Drinking Water Act.

(2) Automatic Transfers. As an alternative to transfers under paragraph (1) of this section, any UIC permit for a well not injecting hazardous waste or injecting carbon dioxide for geologic sequestration may be automatically transferred to a new permittee if:

i. The current permittee notifies the Director at least 30 days in advance of the proposed transfer date referred to in paragraph (2)(ii) of this section;

ii. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them, and the notice demonstrates that the following financial responsibility requirements of 40 CFR 144.52(a)(7) will be met by the new permittee:

The permittee, including the transferor of a permit, is required to demonstrate and maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner prescribed by the Director until:

(A) The well has been plugged and abandoned in accordance with an approved plugging and abandonment plan and submitted a plugging and abandonment report; or

(B) The well has been converted; or

(C) The transferor of a permit has received notice from the Director that the owner or operator receiving transfer of the permit, the new permittee, has demonstrated financial responsibility for the well.

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 a financial statement or other materials acceptable to the Director.

iii. The Director does not notify the existing permittee and the proposed new permittee of intent to modify or revoke and reissue the permit. A modification under this paragraph may also be a minor modification under section c) – Minor Modification of Permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph (2)(ii) of this section.

7. Property Rights (40CFR144.51(g))

This permit does not convey any property rights of any sort, or any exclusive privilege.

8. Duty to Provide Information (40CFR144.51(h))

The permittee shall furnish to the Director within a time specified, any information which the Director may request to determine whether cause exists for modifying, revoking and re-issuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this permit.

9. Inspection and Entry (40CFR144.51(i))

The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by the law, to:

a) Enter upon the permittees premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b) Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;

c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d) Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA and / or UWQA any substances or parameters at any location.

10. Monitoring and Records (40CFR144.51(j))

a) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

b) The permittee shall retain records of all monitoring information, including the following:

(1) Calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time; and

(2) The nature and composition of all injected fluids until three years after the completion of any plugging and abandonment as appropriate. The Director may require the owner or operator to deliver the records to the Director at the conclusion of the retention period.

c) Records of monitoring information shall include:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The names of individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

11. Signatory Requirements (40CFR144.51(k))

All reports or other information, submitted as required by this permit or requested by the Director, shall be signed and certified as follows:

a) Applications. All permit applications shall be signed as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means;

i. A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or

ii. the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

Note:
DEQ does not require specific assignments or delegations of authority to responsible corporate officers identified in 40 CFR 144.32(a)(1)(i). DEQ will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the Director to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under 40 CFR 144.32(a)(1)(ii) rather than to specific individuals.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

b) Reports. All reports required by permits and other information requested by the Director shall be signed by a person described in section a), or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a) of this section;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. A duly authorized

representative may thus be either a named individual or any individual occupying a named position; and

(3) The written authorization is submitted to the Director.

c) Changes to authorization. If an authorization under section b) is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of section b) must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

d) Certification. Any person signing a document under section a) or b) shall make the following certification:

"I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OF THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

12. Reporting Requirements (40CFR144.51(l))

Specific requirements for reporting the following items are included in Part III of the permit.

a) Planned Changes
The permittee shall give written notice to the Director, as soon as possible, of any planned physical alterations or additions to the UIC-permitted facility. Notification of planned changes on the part of the permittee, does not stay any permit condition.

b) Anticipated Noncompliance
The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements. Notification of anticipated noncompliance on the part of the permittee, does not stay any permit condition.

c) Permit Transfers
This permit is not transferable to any person except in accordance with section d) of Permit Actions – Transfer of Permit. The Director may require modification or revocation and re-issuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Safe Drinking Water Act and / or the UWQA.

d) Monitoring
Monitoring results shall be reported at the intervals specified in Part III of this permit.

e) Compliance Schedule Reports
Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule specified in Part III B of this permit shall be submitted no later than 30 days following each schedule date.

f) Endangering Noncompliance
The permittee shall report to the Director any noncompliance that may endanger health or the environment, as follows:

(1) Twenty-four Hour Reporting
Endangering noncompliance information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. Such reports shall include, but not be limited to, the following information:

i. Any monitoring or other information that indicates any contaminant may cause an endangerment to a USDW, or

ii. Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs.

(2) Five-day Reporting
A written submission shall be provided within five days of the time the permittee becomes aware of the circumstances of the endangering noncompliance. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

g) Other Noncompliance
The permittee shall report all instances of noncompliance not reported under 12d) (Monitoring Reports), 12e) (Compliance Schedule Reports), or 12f) (Endangering Noncompliance Monitoring) of this section in the next Monitoring Report. The reports shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

h) Other Information
When the permittee becomes aware of a failure to submit any relevant facts in the permit application or submitted incorrect information in a permit application or in any report to the Director, the permittee shall

submit such facts or information within 10 days after becoming aware of the failure to submit relevant facts.

13. Requirements Prior to Commencing Injection (40CFR144.51(m))

a) For new injection well authorized by individual permit, a new injection well may not commence injection until construction is complete, and

(1) The permittee has submitted notice of completion of construction to the Director; and

(2) Either of the following:

i. The Director has inspected or otherwise reviewed the new injection well and finds it is in compliance with the conditions of the permit; or

ii. The permittee has not received notice from the Director of his or her intent to inspect or otherwise review the new injection well within 13 days of the date of the notice in section a), in which case prior inspection or review is waived and the permittee may commence injection. The Director shall include in his notice a reasonable time period in which he shall inspect the well.

b) For new injection wells authorized by an area permit under UAC R317-7-7 (40 CFR 144.33), requirements prior to commencing injection shall be specified in Part III of the permit.

14. Notification Prior to Conversion or Abandonment. (40CFR144.51(n))

The permittee shall notify the Director at such times as the permit requires before conversion or abandonment of the well or in the case of area permits before closure of the projects.

15. Plugging and Abandonment Requirements. (40CFR144.51(o))

A Class III permit shall include, conditions for developing a plugging and abandonment plan that meets the applicable requirements of UAC R317-7 to ensure that plugging and abandonment of the well will not allow the movement of fluids into or between USDWs. If the plan meets the plugging and abandonment requirements of UAC R317-7, the Director shall incorporate it into the permit as a permit condition. Where the review of the plan submitted in the permit application indicates the plan is inadequate, the Director may require the applicant to revise the plan, prescribe conditions meeting the requirements of this paragraph, or deny the permit. For purposes of this paragraph, temporary or intermittent cessation of injection operations is not abandonment. Requirements for implementing the approved plugging and abandonment plan are specified in Part III of this permit.

16. Plugging and Abandonment Report. (40CFR144.51(p))

Requirements for submitting a plugging and abandonment report are specified in Part III of this permit.

17. Duty to Establish and Maintain Mechanical Integrity. (40CFR144.51(q))

    a) The owner or operator of a Class III well shall establish prior to commencing injection or on a schedule determined by the Director, and thereafter maintain mechanical integrity as defined in 40CFR146.8.

    b) When the Director determines that a Class III well lacks mechanical integrity pursuant to 40CFR146.8, written notice of this determination shall be given to the owner or operator. Unless the Director requires immediate cessation, the owner or operator shall cease injection into the well within 48 hours of receipt of the Director's determination. The Director may allow plugging of the well pursuant to the requirements of UAC R317-7 or require the permittee to perform such additional construction, operation, monitoring, reporting and corrective action as is necessary to prevent the movement of fluid into or between USDWs caused by the lack of mechanical integrity. The owner or operator may resume injection upon written notification from the Director that the owner or operator has demonstrated mechanical integrity pursuant to 40CFR146.8.

    c) The Director may allow the owner/operator of a well which lacks internal mechanical integrity pursuant to 40CFR146.8(a)(1) to continue or resume injection, if the owner or operator has made a satisfactory demonstration that there is no movement of fluid into or between USDWs.

PART III. SPECIFIC PERMIT CONDITIONS

A. DURATION OF PERMIT
(R317-7-9.5 and 40CFR144.36)

This UIC Class III Solution Mining permit shall be issued for a period to include that time required to complete the solution mining of each underground hydrocarbon storage cavern to the permitted capacity, to demonstrate mechanical integrity of the well/cavern system, and to effect the transfer of control from the Utah Division of Water Quality (DWQ) to the Utah Division of Oil, Gas and Mining (DOGM) for regulatory oversight of the operation and maintenance of the underground hydrocarbon storage facility.

The Director of the Division of Water Quality (hereafter 'the Director') shall review this permit once every five (5) years to determine whether it should be modified, revoked and re-issued, terminated, or undergo minor modification according to the conditions of Part II (D)(6) of this permit.

B. COMPLIANCE SCHEDULE
(40CFR144.53)

Magnum must address each of the following conditions within the time period indicated for each item. Failure to do so may result in the termination of the permit according to Part II(D)(6)(b) of this permit.

1. Construction and Cavern Development Plan

   Magnum shall submit for the Director's approval a revised Construction and Cavern Development Plan for all NG well/cavern systems that meets the requirements of Part III (D) of this permit.

   The Plan shall be submitted within 90 days of the effective date of this permit but before construction of any well or solution mining of any caverns.

2. Monitoring, Recording and Reporting Plan

   Magnum shall submit for the Director's approval a revised Monitoring, Recording and Reporting Plan for all NG well/cavern systems that meets the requirements of Part III (E) and (F) of this permit.

   The Plan shall be submitted within 90 days of the effective date of this permit but before construction of any well or solution mining of any caverns.

3. Financial Responsibility

   Magnum shall submit evidence of adequate resources acceptable to the Director and the Director of the Division of Oil, Gas and Mining (hereafter 'the Director of DOGM'), if applicable; to implement the approved closure and abandonment plan required by this permit.

Prior to the commencement of drilling NG cavern wells, Magnum shall submit evidence of adequate resources to plug and abandon the additional cavern well.

C. CORRECTIVE ACTION
(40CFR144.52(2). 40CFR144.55, 40CFR146.7)

As of the effective date of this permit no wells have been identified within the area of review for the Magnum Gas Storage Project that require corrective action.

D. CONSTRUCTION AND CAVERN DEVELOPMENT REQUIREMENTS
(R317-7-10.1(B) and 40CFR146.32)

1. Well Construction and Cavern Development Standards

Each well shall be constructed and each cavern developed according to the requirements for Class III injection wells as set forth in R317-7-10.1(B) and 40CFR146.32 and according to those generally held to be standards by the underground natural gas storage industry as follows and where applicable:

- *Common Practices – Gas Cavern Site Characterization, Design, Construction, Maintenance, and Operation, SMRI Research Report RR2012-03*
- *Recommended Practice for the Design of Solution-Mined Underground Storage Facilities – API Recommended Practice 1114,* API, July 2007
- *Recommended Practice on the Operation of Solution-Mined Underground Storage Facilities – API Recommended Practice 1115 (R2012),* API, October 2012
- *Canadian Standard Association, CWA Z341 Series 14 – Storage of hydrocarbons in underground formations, April 2014*

Additionally, the requirements in the approved Application for a Permit to Drill (APD) issued by DOGM must be met, if applicable.

2. Construction and Cavern Development Plan

The approved and enforceable Construction and Cavern Development Plan is included as Attachment D of this permit.

3. Changes to the Construction and Cavern Development Plan

Changes to the approved Construction and Cavern Development Plan must be approved by the Director as a minor modification of the permit according to Part II (D)(6)(c)(6) of this permit. No such changes may be physically incorporated into construction of the well or the development of the cavern prior to approval of the modification by the Director. All changes must comply with UAC R317-7 and those sections of 40CFR144 and 40CFR146 incorporated by reference in the state rule. To facilitate the minor modification of the permit to incorporate changes to the Construction and Cavern Development Plan, Magnum will send DWQ courtesy copies of all sundry notices sent to DOGM.

4. Casing and Cement

All new Class III wells shall be cased and cemented to prevent the migration of fluids into or between underground sources of drinking water. The Director may waive the cementing requirement for new wells in existing projects or portions of existing projects where there is substantial evidence that no contamination of underground sources of drinking water would result. It is the permittee's responsibility to provide such evidence to the Director. The casing and cement used in the construction of each newly drilled well shall be designed for the life expectancy of the well. The permittee shall consider the following factors in designing a casing and cementing program for the well:

(1) Depth to the injection zone;

(2) Injection pressure, external pressure, internal pressure, axial loading, etc.;

(3) Hole size;

(4) Size and grade of all casing strings (wall thickness, diameter, nominal weight, length, joint specification, and construction material);

(5) Corrosiveness of injected fluids and formation fluids;

(6) Lithology of injection and confining zones; and

(7) Type and grade of cement.

The following requirements pertaining to the cement and casing shall apply:

a) Only new casing shall be installed.

b) Surface and intermediate casing strings shall be used to protect USDWs above the salt structure.

c) All casings shall be cemented to surface.

d) A minimum of one cemented casing shall be set across all non-salt formations.

e) A minimum of two cemented casing strings shall be set in the salt body.

f) Appropriate cement shall be used for cementing across salt formations.

g) Centralizers shall be used on all cemented casing strings and shall be placed to optimize the placement of cement in the casing/borehole annulus.

h) Boreholes shall be conditioned prior to running cement.

i) Joints of last cemented casing shall be gas tight to prevent leakage of gaseous product and/or gaseous blanket material.

5. Logging and Testing

Appropriate logs and other tests shall be conducted during the drilling and construction of new Class III wells. A descriptive report interpreting the results of such logs and tests shall be prepared by a knowledgeable log analyst and submitted to the Director. The logs and tests appropriate to each type of Class III well shall be determined based on the intended function, depth, construction and other characteristics of the well, availability of similar data in the area of the drilling site and the need for additional information that may arise from time to time as the construction of the well progresses. Deviation checks shall be conducted on all holes where pilot holes and reaming are used, unless the hole will be cased and cemented by circulating cement to the surface. Where deviation checks are necessary they shall be conducted at sufficiently frequent intervals to assure that vertical avenues for fluid migration in the form of diverging holes are not created during drillings.

The following geophysical logs and tests must be performed during construction of each well/cavern system:

a) Cement Evaluation Log shall be run according to Part III (H) of this permit.

b) Casing Inspection Log (ultrasonic or electromagnetic flux) shall be run on last cemented casing, from casing seat to surface, before installing leaching strings.

c) Hydrostatic pressure and nitrogen/brine interface tests according to the methods and schedule in Part III (H) of this permit.

d) Inclination and directional surveys starting at 500’ taken 500’ thereafter. Deviation control shall be implemented to maintain the verticality of the well to a maximum of 1.5 degrees average inclination from the vertical at the top of the salt, with no more than 2 degrees or less at any depth.

6. Injection Zone Characterization

a) Where the injection zone is a formation which is naturally water-bearing the following information concerning the injection zone shall be determined or calculated for new Class III wells or projects:

(1) Fluid pressure;

(2) Fracture pressure (determined on MH-1); and

(3) Physical and chemical characteristics of the formation fluids.

b) Where the injection formation is not a water-bearing formation, only the fracture pressure must be submitted.

c) Magnum shall include in the Construction and Cavern Development Plan a description of the method for determining the top of the salt body.

d) Magnum shall submit for Director’s approval a Formation Testing Program to determine the fracture pressure of the salt at the last cemented casing seat.

The approved and enforceable Formation Testing Program is included in the Construction and Cavern Development Plan in Attachment D of this permit.

7. Well Stimulation Program

If the operator intends to stimulate the well to clean the well bore, enlarge channels, and increase pore space in the interval to be injected thereby enhancing the injectivity of the well, a Well Stimulation Program must be prepared for the Director's approval and included in the Construction and Cavern Development Plan in Attachment D of this permit.

8. Monitoring Wells

No monitoring wells are required by this permit. However, ground water monitoring is addressed in the approved Operating Plan included in the Division of Oil, Gas and Mining Board Order issued to Magnum addressing the storage of NG.

9. Leaching String

a) Magnum shall select an appropriate blanket/brine interface tool and appropriate leaching string pair such that the depth of the blanket/brine interface can be confirmed periodically during solution mining of the cavern and such that a sonar survey can be obtained through both leaching strings to monitor the development of the cavern. If Magnum is unable to obtain sonar surveys through both leaching strings, the inner leaching string shall be removed so that a sonar survey can be obtained.

b) The joints of the outer hanging leaching string shall be gas tight so as to prevent the loss of the gaseous blanket material or gaseous product.

10. Cavern Configuration, Spacing, and Standoff Requirements

Each cavern shall be developed, spaced, and set back from the boundary of the salt body (standoff) to maintain mechanical integrity of the caverns, the salt web (the in-situ mass separating adjacent underground caverns and caverns and the edge of the salt body), and the overburden during all modes of cavern development, operation and abandonment for the lifetime of the facility.

Magnum shall maintain optimal S:D ratios for the stability of the cavern storage field, where S is the distance between the centers of two caverns or between a cavern and the edge of the salt body and D is the average of the maximum diameter of the two caverns.

Following are the permitted capacities for each NG cavern:

Cavern	Product Type	Permitted Cavern Capacity (Open Cavern Volume, barrels)	115% of Permitted Cavern Capacity
CW#1	Natural Gas	10,500,000	12,075,000
CW#2	Natural Gas	10,500,000	12,075,000
CW#3	Natural Gas	10,500,000	12,075,000
CW#4	Natural Gas	10,500,000	12,075,000

11. Requirements Prior to Solution Mining

In accordance with Part II (D)(13) of this permit, the following requirements must be met prior to commencing injection (solution mining):

a) Well Completion Data / Report

The operator shall submit to DOGM and for the DWQ Director's review an injection well completion report consisting of:

(1) All available logging and testing data on the well;

(2) Primary cement calculations and evidence of cement returns to surface;

(3) Results of satisfactory demonstration of mechanical integrity;

(4) Actual maximum injection pressure and injection flow rate;

(5) Results of the formation testing program, if applicable;

(6) Actual solution mining procedures;

(7) Status of all wells requiring corrective action within the area of review, if applicable;

(8) Detailed 'As-Built' Well Schematic including:

i. Casing details including size, weight, grade and setting depths,

ii. Cement details including type, special formulations, calculated volumes, actual pumped volumes, and yield (cubic feet / sack),

iii. Formation horizons,

iv. Ground water horizons,

v. Pilot hole.

b) DWQ Director's Approval to Commence Solution Mining

Within 7 days after receipt of the well completion report, the Director shall provide written notice denying or granting approval to commence injection.

c) Compliance with DOGM Rules and Orders

Magnum shall comply with all administrative rules and orders of DOGM prior to the commencement of solution mining.

12. Cavern Development

The Construction and Cavern Development Plan (Attachment D) shall address all modes of cavern development Magnum intends to implement. This includes complete development to permitted capacity before initial product storage and various scenarios of re-leaching of existing caverns. Maintaining the geomechanical stability of the cavern network must be the first priority in developing and implementing an operating plan for cavern development. Cavern shape shall be controlled by maintaining the blanket material, controlling the water injection rate, controlling the locations of the water injection and brine removal, and controlling the salinity of injected water. Control of cavern development shall be facilitated by the use of computer simulations appropriate to the mode of cavern development.

The following conditions shall apply:

a) The NG caverns are generally expected to be completed within 5 years after the commencement of cavern solution mining. It is intended that the NG caverns will be completely solution mined to permitted capacity before product storage commences, and

b) Hanging strings shall be removed after each solution mining phase, and

c) Sonar surveys of the cavern, cavern floor and cavern roof shall be conducted after each solution mining phase and before commencement / re-commencement of product storage, and

d) Nitrogen/brine interface MIT shall be conducted according to Part III (H) after each solution mining phase and before commencement / re-commencement of product storage, and

e) Submittal of well/cavern completion report required by Part III (G)(1) after each solution mining phase and before commencement / re-commencement of product storage, and

f) Written approval from the Director of DWQ to commence / re-commence product storage shall be required.

g) Approval from the Director of DOGM to commence / re-commence product storage shall be required.

13. Maximum Allowable Operating Pressure Gradient (MaxAOPG)

Except during well stimulation, the maximum allowable operating pressure gradient (MaxAOPG) shall be calculated to assure that pressure in the injection zone during injection does not initiate new fractures or propagate existing fractures in the injection zone. In no case shall the injection pressure initiate fractures in the confining zone or cause the migration of injection or formation fluids into an USDW.

Based on the geomechanical analysis of the salt formation in the MH-1 exploratory well, the upper limit of operating pressures is 0.92 psi/ft of depth to the last cemented casing seat. However, Magnum shall provide additional protection by operating at pressure gradients below 0.92 psi/ft of depth as follows:

a) The typical operating pressure gradient of a cavern will be 0.55 psi/ft of depth to the last cemented casing seat.

b) The maximum allowable operating pressure gradient (MaxAOPG) will not be greater than 0.75 psi/ft of depth to the last cemented casing seat. At no time will the caverns be subjected to pressures above this pressure gradient including pressure pulsations and during abnormal operating conditions.

c) The maximum allowable test pressure gradient will not exceed 0.85 psi/ft of depth to the last cemented casing seat.

14. Minimum Allowable Operating Pressure Gradient (MinAOPG)

The permittee shall maintain a minimum operating pressure gradient during the creation and operation of each cavern that is protective of the integrity of the wells, caverns, salt web, and overburden. Magnum shall maintain a MinAOPG of 0.25 psi/ft of depth based on the geomechanical analysis of the salt formation.

15. Borehole – Casing Annulus Injection Prohibited

Injection between the outermost casing protecting USDW's and the well bore is prohibited.

E. MONITORING AND RECORDING REQUIREMENTS (R317-7-10.3(B), 40CFR144.54, and 40CFR146.34)

1. Well and Cavern Monitoring and Recording Standards

Monitoring and recording requirements for the drilling and solution mining of each well/cavern are set forth in R317-7-10.3(B) and 40CFR144.54 and those generally held to be standards by the underground natural gas storage industry as follows and where applicable:

- *Common Practices – Gas Cavern Site Characterization, Design, Construction, Maintenance, and Operation, SMRI Research Report RR2012-03*

- *Recommended Practice for the Design of Solution-Mined Underground Storage Facilities – API Recommended Practice 1114*, API, July 2007
- *Recommended Practice on the Operation of Solution-Mined Underground Storage Facilities – API Recommended Practice 1115 (R2012)*, API, October 2012
- *Canadian Standard Association, CWA Z341 Series 14 – Storage of hydrocarbons in underground formations, April 2014*

Additionally, the monitoring and recording requirements for the drilling of each well in the approved Application for a Permit to Drill (APD) issued by DOGM must be met, if applicable. Monitoring and recording requirements for hydrocarbon storage shall be set by DOGM once the well / cavern system has been released from the Class III UIC permit.

2. Monitoring, Recording and Reporting Plan

The approved and enforceable Monitoring, Recording and Reporting Plan is included as Attachment E of this permit.

3. Monitoring Equipment and Methods

All monitoring equipment shall be properly selected, installed, used, and maintained according to the manufacturer's specifications so as to yield data which are representative of the monitored activity. All monitoring methods shall be properly selected and implemented at appropriate intervals and frequency so as to yield data which are representative of the monitored activity. Documentation verifying, if applicable, the proper selection, installation, use, and maintenance of monitoring equipment and the proper implementation of monitoring methods shall be made available to the Director upon request.

4. Injectate Characterization

The permittee shall monitor the nature of injected fluids with sufficient frequency to yield representative data on its characteristics. The permittee shall provide qualitative analysis and ranges in concentrations of all constituents of injected fluids. Whenever the injection fluid is modified to the extent that this analysis is incorrect or incomplete, a new analysis shall be provided to the Director. The applicant may request confidentiality in accordance with Part II C of this permit. If the information is proprietary an applicant may, in lieu of the ranges in concentrations, choose to submit maximum concentrations which shall not be exceeded. In such a case the applicant shall retain records of the undisclosed concentrations and provide them upon request to the Director as part of any enforcement investigation.

Magnum shall submit a complete chemical analysis of the solution mining media (injectate) every two years. The sample shall be taken during a period of active solution mining.

5. Mechanical Integrity Testing (MIT)

   Mechanical integrity testing shall be conducted according to the methods and schedule in Part III (H) of this permit.

6. Cavern Development Monitoring

   The following must be monitored during cavern development:

   a) Magnum shall monitor the shape of the cavern, by sonar surveys, during development to ensure a stable shape and configuration is achieved, and

   b) Magnum shall maintain the location of the blanket/brine interface. It is not sufficient to estimate the depth of the interface from the volume of blanket material injected. Magnum shall perform periodic wireline surveys to confirm the location of the blanket/brine interface with increased frequency when the solution mining mode is switched from direct to reverse. If the interface cannot be confirmed by wireline surveys, solution mining must stop immediately until the interface can be re-established and confirmed.

   c) Magnum shall conduct daily monitoring of flow rate of injected water, saturation level of injected water, pressure of injected water, temperature of injected water, flow rate of produced brine, saturation level of produced brine, pressure of produced brine, temperature of produced brine, pressure of blanket, volume of blanket, temperature of blanket.

7. Weekly Brine Analysis

   Magnum shall conduct weekly or more frequently as needed, analysis of the produced brine for at least magnesium (Mg) and potassium (K) to identify zones of highly soluble salts. If highly soluble zones are identified, adjustment of the solution mining process may be necessary.

F. REPORTING REQUIREMENTS
(R317-7-10.4(B) and 40 CFR 144.54)

1. Quarterly Monitoring Reports

   a) Schedule for Submitting Quarterly Monitoring Report

Quarter		Report Due On:
1st Quarter	Jan 1 – Mar 31	Apr 15
2nd Quarter	Apr 1 – Jun 30	July 15
3rd Quarter	Jul 1 – Sep 30	Oct 15
4th Quarter	Oct 1 – Dec 31	Jan 15

   b) Content of Quarterly Monitoring Reports

   Monitoring data for the following shall be included in the quarterly monitoring reports:

   (1) Periodic Injectate Characterization

(2) Daily cavern development monitoring data

(3) Weekly Brine Analysis

(4) Wireline logs for all blanket/brine interface confirmations

(5) Sonar surveys for all cavern shape and configuration verification

(6) Noncompliance Not Previously Reported – Such reports shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

(7) Other Required Monitoring

2. Endangering Noncompliance Reporting

The permittee shall report to the Director any noncompliance that may endanger health or the environment, as follows:

a) Twenty-four Hour Reporting
Endangering noncompliance information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. Such reports shall include, but not be limited to, the following information:

(1) Any monitoring or other information that indicates any contaminant may cause an endangerment to a USDW, or

(2) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs.

b) Five-day Reporting
A written submission shall be provided within five days of the time the permittee becomes aware of the circumstances of the endangering noncompliance. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.

3. Planned Changes

The permittee shall give written notice to the Director, as soon as possible, of any planned physical alterations or additions to the UIC-permitted facility. Notification of planned changes on the part of the permittee, does not stay any permit condition.

4. Anticipated Noncompliance

   The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements. Notification of anticipated noncompliance on the part of the permittee, does not stay any permit condition.

5. Permit Transfers

   This permit is not transferable to any person except in accordance with Part II (D)(6)(d) of this permit. The current permittee shall notify the Director at least 30 days in advance of the proposed transfer date. Notification shall comply with the requirements in Part II(D)(6)(d) of this permit.

6. Compliance Schedule Reporting

   Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule specified in Part III B of this permit shall be submitted no later than 30 days following each schedule date.

7. Mechanical Integrity Reporting

   a) Mechanical Integrity Demonstration - Except where it is required to commence or re-commence product storage, the permittee shall submit the results of any MI demonstration within 60 days after completion of the test. The permittee shall include in the report, a detailed description of the tests and the methods used to demonstrate MI. In the case of MI failure, the permittee shall also describe in detail what and when steps were taken to reestablish MI.

   b) Loss of Mechanical Integrity –

      (1) In the event of a mechanical integrity failure which may potentially endanger an USDW, report to the Director verbally within 24 hours followed by submission of a written report within 5 days.

      (2) Within 14 days after loss of MI, submit to the Director a schedule indicating what will be done to restore MI to the well, or if it will be plugged.

8. Closure and Abandonment (“As-Plugged”) Report

   Within 60 days after permanently or temporarily plugging and abandoning a well, the permittee shall submit a Closure and Abandonment Report to the Director. The report shall be certified as accurate by the person who performed the closure and abandonment operation, and shall consist of either:

   a) A statement that the well was plugged in accordance with the Closure and Abandonment Plan(s) previously submitted to, and all conditions of approval provided by, the Director; or

b) If the actual closure and abandonment differed from the approved plan(s), a statement and diagrams defining the actual closure and abandonment and why the Director should approve such deviation. Any deviation from the previously approved individual plans required by this permit which may endanger waters of the State of Utah, including USDWs, is cause for the Director to require the operator to re-plug the well.

9. Permit Review Report

Within 30 days after receipt of this permit, the permittee shall report to the Director that the person(s) responsible for implementing this permit has read and is personally familiar with all terms and conditions of this permit.

10. Electronic Reporting

In addition to submittal of the hard copy data, the permittee shall submit the required monitoring data in the electronic format specified by the Director.

G. REQUIREMENTS PRIOR TO PRODUCT STORAGE

1. Well / Cavern Completion Report

The operator shall submit to DOGM and to the DWQ Director, for review a well / cavern completion report at the end of each solution mining phase consisting of:

a) All available logging and testing data on the well/cavern system not previously submitted with the well completion report;

b) Results of mechanical integrity testing for well/cavern system;

c) Detailed 'As-Built' well/cavern schematic including any changes made to the original well 'As-Built' schematic;

d) Sonar survey of the cavern including floor and roof surveys;

2. Director's Approval to Commence Product Storage

Within 14 days after receipt of the well / cavern completion report, the Director shall provide written notice denying or granting approval to commence product storage.

3. Compliance with DOGM Rules and Orders

Magnum shall comply with all administrative rules and orders of DOGM prior to the commencement of product storage.

H. MECHANICAL INTEGRITY (R317-7-10.3(B) and 40CFR146.8)

1. Class III Injection Well Mechanical Integrity Standards

Mechanical integrity testing requirements for each Class III well are set forth in R317-7-10.3(B) and 40CFR146.8. Additionally, the mechanical integrity requirements for each well in the approved Application for a Permit to Drill (APD) issued by DOGM must be met.

All injection wells shall have and maintain mechanical integrity (MI) consistent with the requirements of 40 CFR 146.8. An injection well has MI if there is:

a) No significant leak in casing, tubing, or packer (internal MI), and

b) No significant fluid movement into an USDW through vertical channels adjacent to the injection well bore (external MI).

2. Mechanical Integrity Testing (MIT) Methods

The following testing methods shall be employed to demonstrate MI of the well / cavern system:

a) Internal MI

(1) Hydrostatic Pressure Test

The hydrostatic pressure test shall be conducted according to R649-3-7.4 – Well Control, Pressure Tests as follows:

i. Last two cemented casings in salt at the time of construction

ii. Casing seat of last cemented casing after drilling 20’ into salt

(2) Nitrogen/Brine Interface Test

The nitrogen/brine interface test shall be conducted according to UIC Guidances UIC-3-14, 15, 16, and 17 as follows:

i. Last cemented casing string before commissioning the cavern

ii. Last cemented casing string after workover involving last cemented casing

iii. Last cemented casing string every 5 years after initial test

b) External MI

(1) Nitrogen/Brine Interface Test

i. Well/pilot hole before solution mining of cavern commences

ii. Well/cavern before commissioning the cavern

iii. Well/cavern every 5 years after initial test

(2) Cement Records

Primary cement records for each cemented casing string obtained during construction of each well.

(3) Cement Evaluation Logs

Conducted on surface, all intermediate and production casings after WOC of 72 hours and after attaining a compressive strength of 500 psi unless an appropriate cement evaluation tool is not available for the larger diameter casings in which case an alternative logging program shall be proposed by the permittee.

3. Mechanical Integrity Demonstration Plan

The permittee shall prepare a detailed plan to demonstrate MI to be included in the approved and enforceable Monitoring, Recording and Reporting Plan in Attachment E of the permit. In preparing a plan, which includes MI tests or demonstration methods allowed by the Director, the permittee shall apply methods and standards generally accepted in the industry for conducting and evaluating the tests (40CFR146.8(e)).

4. Prohibition Without Demonstration

The permittee shall not commence injection operation of any new well without:

a) Prior demonstration of MI, and

b) Receipt of Director written approval of the MI demonstration.

5. Loss of Mechanical Integrity

If the permittee or the Director determines that a well fails to demonstrate MI the permittee shall:

a) Cease operation of the well immediately, and

b) Take steps to prevent losses of brine into USDWs, and

c) Within 90 days after loss of MI, restore MI or plug and abandon the well in accordance with a plugging and abandonment plan approved by the Director.

d) The permittee may resume operation of the well after demonstration of MI and receiving written approval from the Director.

6. Mechanical Integrity Demonstration Requests

With just cause, the Director may at any time require, by written notice, the permittee to demonstrate MI of a well.

7. Mechanical Integrity Demonstration Inspections

The permittee shall allow the Director, or his representative, to observe any or all MI demonstrations. The permittee shall notify the Director, in writing, of its

intent to demonstrate MI, no less than 14 days prior to the intended demonstration.

I. WELL AND CAVERN CLOSURE AND ABANDONMENT
(40CFR146.10 and R317-7-10.5)

If a well or well/cavern system is required to be plugged and abandoned before it has been transferred to DOGM for regulatory oversight for operation and maintenance, Magnum shall submit for the Director's approval a comprehensive plan for cavern evacuation, decommissioning and well abandonment that meets the requirements that are generally held to be closure and abandonment standards by the underground hydrocarbon storage industry. The approved closure and abandonment plan shall become an enforceable attachment (Attachment F) to this permit.

J. FINANCIAL RESPONSIBILITY
(R317-7-9.1(24) and 40CFR144.52)

1. Demonstration of Financial Responsibility

The permittee is required to maintain financial responsibility and resources to close, plug, and abandon all wells and well/cavern systems. This requirement is demonstrated by submission of evidence of financial responsibility acceptable to the Director and, if applicable, to the Director of DOGM to implement the approved well and cavern closure and abandonment plan (Attachment F) required by this permit. Evidence of adequate financial assurance is included in Attachment G of this permit.

2. Renewal of Financial Responsibility

Every five (5) years, the permittee shall demonstrate the adequacy of the financial assurance instrument to close, plug and abandon all well/cavern systems not permanently closed and abandoned by the permittee in compliance with the closure and abandonment requirements of this permit.

3. Alternate Financial Responsibility

The permittee must submit an alternate demonstration of financial responsibility acceptable to the Director within 60 days after any of the following events occurs:

a) The institution issuing the financial assurance instrument files for bankruptcy; or

b) The authority of the institution issuing the financial assurance instrument is suspended or revoked; or

c) In the case a Certificate of Deposit (CD) is used to demonstrate financial responsibility, the CD is determined to be insufficient to cover well closure, plugging and abandonment; or

d) In the case a Certificate of Deposit (CD) is used to demonstrate financial responsibility, the CD is suspended or revoked.

K. ADDITIONAL CONDITIONS (40CFR144.52)

1. Geomechanical Analysis

Once each NGL cavern has been solution mined to its full permitted capacity the cavern will continue to grow due to product displacement with less than fully saturated brine. Where S equal the distance between the centers of the two caverns and D equals the average of the maximum diameter of the two caverns, Magnum shall perform a geomechanical analysis of the cavern field to verify the geomechanical stability of the caverns, salt web and overburden when either of the following occurs:

a) When the S:D ratio falls below 2:1 for any NGL cavern and adjacent pillar or edge of the salt body, or

b) When the S:D ratio falls below 4:1 for any NG cavern and adjacent pillar or edge of the salt body, or

c) When the open cavern volume of any cavern exceeds the permitted cavern capacity by 15%.

Magnum shall be required to take appropriate action if the results of the analysis indicate such action is necessary.

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Attachment A

General Location Map of the Magnum Gas Storage Project,
Millard County

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PUBLIC COPY

FILE NAME: 193 - CLYDE SNOW SS\29.220 - 09 CLASS III PERMIT\CAD\MAP 1 - GENERAL LOCATION MAP.DWG FILE DATE: 10.2.2009 12:32:02 (CAH)

HANSEN ALLEN & LUCE inc. ENGINEERS

03/04

GENERAL LOCATION MAP

FIGURE 1

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Attachment B

Map of the Magnum Gas Storage Project Area of Review including the Class III Solution Mining Injection Wells and the Project Area

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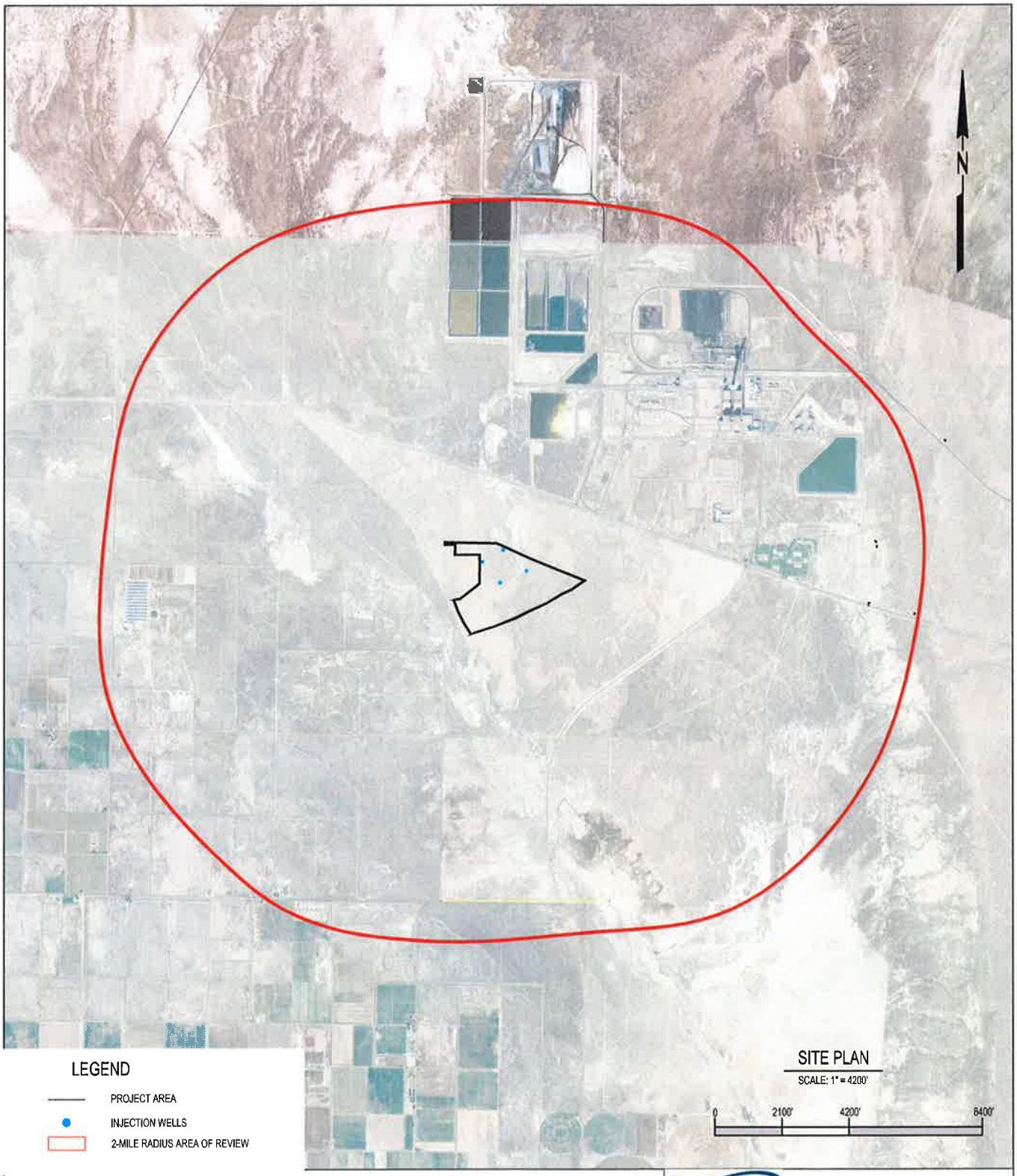


LEGEND

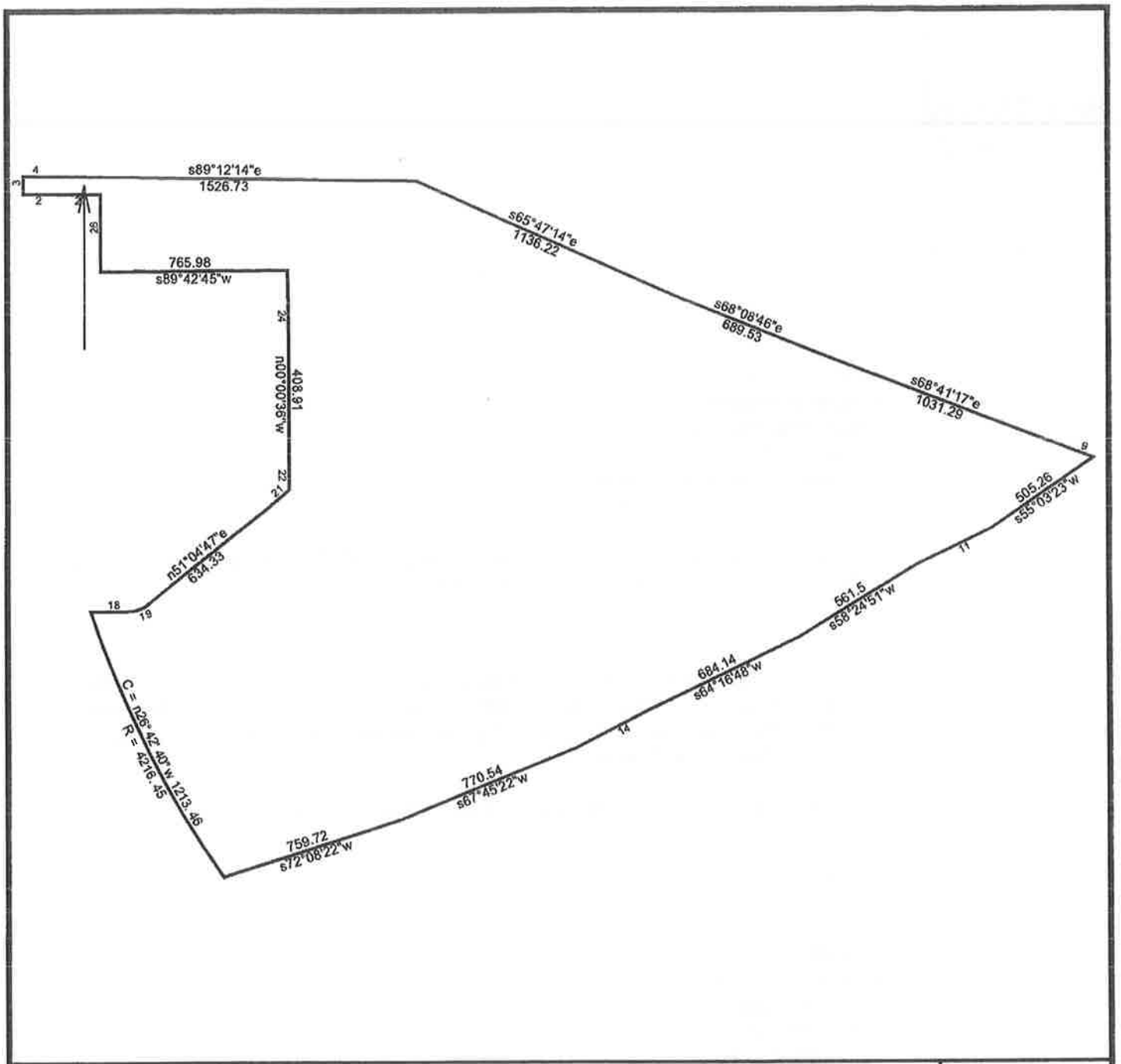
- PROJECT AREA
- INJECTION WELLS
- 2-MILE RADIUS AREA OF REVIEW

CLASS III AREA PERMIT
UNDERGROUND INJECTION CONTROL (UIC PROGRAM)
ATTACHMENT B

MAGNUM Gas Storage
3165 E. MILLROCK DR, SUITE 330
HOLLADAY, UTAH 84121
PHONE: (801) 993-7001

DATE: 08/04/2014	SURVEYED BY: SUNRSIE	SHEET NO: 1
DATE DRAWN: 08/04/2014	DRAWN BY: LMR	
SCALE: 1"=4200'	REVISED: TJ	

SHEET NAME:
MAGNUM SOLUTION MINING LLC



9/11/2014

Scale: 1 inch= 559 feet | File:

Tract 1: 141.0775 Acres, Closure: s86.5644w 0.02 ft. (1/763675), Perimeter=13097 ft.

01 /n00.1823e 1013.34
02 n89.2953w 79.82
03 n00.3402e 72.17
04 s89.1214e 79.5
05 s89.1214e 1526.73
06 s65.4714e 1136.22
07 s68.0846e 689.53
08 s68.4117e 1031.29
09 s68.4117e 118.41
10 s55.0323w 505.26
11 s64.0129w 334.36
12 s58.2451w 561.5
13 s64.1648w 684.14
14 s62.1443w 328.65
15 s67.4522w 770.54
16 s72.0822w 759.72
17 Rt, r=4216.45, chord=n26.4240w 1213.46
18 s89.4944e 143.09
19 Lt, r=174.52, delta=028.0546, chord=n76.0723e 84.72
20 n51.0447e 634.33
21 n49.2854e 124.07
22 n00.0036w 189.98
23 n00.0036w 408.91
24 n00.4708w 300
25 s89.4245w 765.98
26 n00.0016e 314.5
27 n89.2953w 235.29

MAGNUM SOLUTION MINING, LLC UIC BOUNDARY

Commencing at Southeast corner of Section 22; Township 15 South, Range 7 West, Salt Lake Meridian; thence North 00°18'23" East 1013.34 feet along section line to the POINT OF BEGINNING; thence North 89°29'53" West 79.82 feet; thence North 00°34'02" East 72.17 feet; thence South 89°12'14" East 79.50 feet to a point on section line; thence continuing in Section 23, T15S, R7W, SLM, South 89°12'14" East 1526.73 feet; thence South 65°47'14" East 1136.22 feet; thence South 68°08'46" East 689.53 feet; thence South 68°41'17" East 1031.29 feet to a point on section line; thence continuing in Section 26, T15S R7W, SLM, South 68°41'17" East 118.41 feet; thence South 55°03'23" West 505.26 feet; thence South 64°01'29" West 334.36 feet; thence South 58°24'51" West 561.50 feet; thence South 64°16'48" West 684.14 feet; thence South 62°14'43" West 328.65 feet; thence South 67°45'22" West 770.54 feet; thence South 72°08'22" West 759.72 feet to a point on a non-tangent curve to the right having a radius of 4216.45 feet and a chord that bears North 26°42'40" West 1213.46 feet; thence along said curve a distance of 1217.68 feet; thence South 89°49'44" East 143.09 feet to a curve to the left having a radius of 174.52 feet, a central angle of 28°05'46" and a chord that bears North 76°07'23" East 84.72 feet; thence along said curve a distance of 85.58 feet; thence North 51°04'47" East 634.33 feet; thence North 49°28'54" East 124.07 feet; thence North 00°00'36" West 189.98 feet to a point on section line; thence continuing in said Section 23, North 00°00'36" West 408.91 feet; thence North 00°47'08" West 300.00 feet; thence South 89°42'45" West 765.98 feet; thence North 00°00'16" East 314.50 feet; thence North 89°29'53" West 235.29 feet to the POINT OF BEGINNING. Contains 6145316 square feet or 141.077 acres, more or less.

PROFESSIONAL LAND SURVEYOR
9/11/14
No. 189369
DALE J.
ROBINSON
STATE OF UTAH

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Attachment C

Corrective Action Plan for Artificial Penetrations into Injection Zone within Area of Review

As of the effective date of this permit modification there are no wells requiring corrective action.

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Attachment D

Construction and Cavern Development Plan

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Attachment E

Monitoring, Recording, and Reporting Plan

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Attachment F

Well and Cavern Closure and Abandonment Plan

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Attachment G

Financial Responsibility

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