



REGION 5

CHICAGO, IL 60604

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY UNDERGROUND INJECTION CONTROL PERMIT: CLASS V SPENT BRINE REINJECTION WELL (5X16)

Permit Number: MI-105-5X16-17

Facility Name: Well S-34

Pursuant to the provisions of the Safe Drinking Water Act, as amended 42 U.S.C. §§300f et seq., (commonly known as the SDWA) and implementing regulations promulgated by the U.S. Environmental Protection Agency (EPA) at Parts 124, 144, 146, and 147 of Title 40 of the Code of Federal Regulations (40 C.F.R.),

Martin Marietta Magnesia Specialties, LLC of Manistee, Michigan

is hereby authorized to continue operating an existing Class V injection well located in Michigan, Mason County, T20N, R17W, Section 27, NW 1/4 Section, for injection into the Amherstburg and Bois Blanc Formations at depths between 2630 and 2752 feet relative to Kelly bushing, upon the express condition that the permittee meet the restrictions set forth herein.

The injection shall be limited to the non-commercial disposal of spent brine produced by Martin Marietta Magnesia Specialties, LLC into the same formation from which it was withdrawn after extraction of halogens or their salts.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit becomes effective. All terms used in this permit shall have the meaning set forth in the SDWA or 40 C.F.R. Parts 124, 144, 146, and 147. The following attachments are incorporated into this permit: A, B, C, and D.

This permit shall become effective on _____, and shall remain in full force and effect during the life of the permit, unless this permit is revoked and reissued, terminated, or modified pursuant to 40 C.F.R. §§144.39, 144.40, or 144.41. This permit shall also remain in effect upon delegation of primary enforcement responsibility to the State of Michigan, unless that State chooses to adopt this permit as a State permit.

This permit and the authorization to inject shall expire at midnight on _____, unless terminated prior to the expiration date.

Signed and Dated: _____

DRAFT

Tera L. Fong
Division Director, Water Division

PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. Notwithstanding any other provisions 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 injection, annulus or formation fluids into underground sources of drinking water (USDWs). The objective of this permit is to prevent the introduction of contaminants into USDWs if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 C.F.R. Part 141 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit is prohibited. For purposes of enforcement, compliance with this permit during its term constitutes compliance with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other common or statutory law other than Part C of the SDWA. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it 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. PERMIT ACTIONS

1. **Modification, Revocation and Reissuance, and Termination** - The Director of the Water Division of the United States Environmental Protection Agency (EPA), hereinafter, the Director, may modify, revoke and reissue, or terminate this permit in accordance with 40 C.F.R. §§ 144.39, 144.40, and 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.
2. **Transfer of Permits** - This permit is not transferable to any person except in accordance with 40 C.F.R. §144.38.

C. SEVERABILITY

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

D. CONFIDENTIALITY

In accordance with 40 C.F.R. Part 2, Subpart B and 40 C.F.R. § 144.5, any information submitted to the EPA 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 EPA may make the information available to the public without further notice. If a claim is asserted, the information covered by such a claim will be disclosed by EPA only to the extent, and by means of the procedures set forth in 40 C.F.R. Part 2, Subpart B. Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee; and
2. Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. **Duty to Comply** - The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act (SDWA) and is grounds for enforcement action; for permit termination, revocation and reissuance, or 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 by an emergency permit issued in accordance with 40 C.F.R. § 144.34.
2. **Penalties for Violations of Permit Conditions** - Any person who violates a permit requirement is subject to civil penalties, fines and other enforcement action under the SDWA. Any person who willfully violates permit conditions may be subject to criminal prosecution.
3. **Continuation of Expiring Permits**
 - (a) **Duty to Reapply** - If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit a complete application for a new permit at least 180 calendar days before this permit expires.
 - (b) **Permit Extensions** - The conditions of an expired permit may continue in force in accordance with 5 U.S.C. 558(c) and 40 C.F.R. § 144.37.
 - (c) **Effect** - Permits continued under 5 U.S.C. 558(c) and 40 C.F.R. § 144.37 remain fully effective and enforceable.

(d) **Enforcement** - When the permittee is not in compliance with the conditions of the expiring or expired permit, the Director may choose to do any or all of the following:

- (1) Initiate enforcement action based upon the permit which has been continued;
- (2) Issue a notice of intent to deny the new permit. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operation without a permit;
- (3) Issue a new permit under 40 C.F.R. Part 124 with appropriate conditions; or
- (4) Take other actions authorized by the UIC regulations.

(e) **State Continuation** - An EPA-issued permit does not continue in force beyond its expiration date under Federal law if at that time a State has primary enforcement responsibility under the SDWA. A State authorized to administer the UIC program may continue either EPA or State-issued permits until the effective date of the new permits, if State law allows. Otherwise, the facility or activity is operating without a permit from the time of expiration of the old permit to the effective date of the State-issued new permit. Furthermore, if the State does not continue the EPA permit upon obtaining primary enforcement responsibility, the permittee must obtain a new State permit or be authorized to inject by State rule. Failure to do so while continuing to operate the well constitutes unauthorized injection and is a violation subject to enforcement action.

4. **Need to Halt or Reduce Activity Not a Defense** - It shall not be a defense for the permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
5. **Duty to Mitigate** - The permittee shall take all timely and reasonable steps necessary to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.
6. **Proper Operation and Maintenance** - 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 include effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and 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.

7. **Duty to Provide Information** - 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 reissuing, 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.
8. **Inspection and Entry** - The permittee shall allow the Director or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
 - (a) Enter, at reasonable times, upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are 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, any substances or parameters at any facilities, equipment or operations regulated or required under this permit.
9. **Records**
 - (a) The permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original recordings for continuous monitoring instrumentation and copies of all reports required by this permit for a period of at least three years from the date of the sample, measurement or report, unless these materials are submitted to the Director as part of reporting requirements under this permit.
 - (b) The permittee shall retain records of all data required to complete the permit application form for this permit and any supplemental information submitted under 40 C.F.R. §§ 144.27, 144.28, and 144.31 for a period of at least three years from the date the permit application was signed.

- (c) The permittee shall retain records concerning the nature and composition of all injected fluids until three years after the completion of plugging and abandonment of this injection well.
- (d) The retention period specified in Part I(E)(9)(a) through (c) of this permit may be extended by request of the Director at any time. The permittee shall continue to retain records after the retention period specified in Part I(E)(9)(a) through (c) of this permit or any requested extension thereof expires unless the permittee delivers the records to the Director or obtains written approval from the Director to discard the records.
- (e) Records of monitoring information shall include:
 - (1) The date, exact place, and time of sampling or measurements;
 - (2) The name(s) of individual(s) who performed the sampling or measurements;
 - (3) A precise description of both sampling methodology and the handling of samples;
 - (4) The date(s) analyses were performed;
 - (5) The name(s) of individual(s) who performed the analyses;
 - (6) The analytical techniques or methods used; and
 - (7) The results of such analyses.

10. Notification Requirements

- a. **Planned Changes** - The permittee shall notify and obtain the Director's approval at least 30 days prior to any planned physical alterations or additions to the permitted facility, or changes in the injection fluids. Not less than 10 days prior to injection, an analysis of any new injection fluid shall be submitted to the Director for approval in accordance with Parts II(B)(2) and II(B)(3) of this permit.
- b. **Anticipated Noncompliance** - The permittee shall give at least 30 days advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.
- c. **Transfer of Permits** - This permit is not transferable to any person except after notice is sent to the Director at least 30 days prior to transfer and the requirements of 40 C.F.R. §144.38 have been met. The Director may require

modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the SDWA.

- d. **Compliance Schedules** - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted to the Director no later than 30 days following each schedule date.
- e. **Twenty-Four Hour Reporting**
 - (i) The permittee shall report to the Director any noncompliance that may endanger health or the environment. This information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances, and shall include the following information:
 - (a) Any monitoring or other information that indicates that any contaminant may cause an endangerment to an underground source of drinking water; or,
 - (b) Any noncompliance with a permit condition or malfunction of the injection system which may cause fluid migration into or between underground sources of drinking water; or,
 - (c) Any failure to maintain mechanical integrity.
 - (ii) A written submission shall also be provided within five days from the time the permittee becomes aware of the circumstances. 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.
- f. **Other Noncompliance** - All other instances of noncompliance shall be reported at the time when monthly reports are submitted under Part II(B)(3)(a) of this permit. The written submission shall contain the information listed in Part I(E)(10)(e)(ii).
- g. **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 corrected information within 10 days.

h. **Report on Permit Review** - Within 30 days of receipt of the final issued permit, the permittee shall report to the Director that the permittee has read and is personally familiar with all terms and conditions of this permit.

11. **Signatory Requirements**

All reports required by this permit and other information requested by the Director shall be signed and certified according to 40 CFR §144.32.

12. **Notice of Plugging and Abandonment**

The permittee shall notify the Director at least 45 days before conversion or abandonment of the well.

13. **Plugging and Abandonment**

The permittee shall plug and abandon the well as provided in the plugging and abandonment plan contained in Part III(B) of this permit. Plugging shall occur as soon as practicable after operation ceases but not later than two years thereafter. During the period of non-operation, the well must be tested to ensure that it maintains mechanical integrity, unless the permittee fulfills the other requirements under 40 C.F.R. § 144.52(a)(6), prior to expiration of the two-year period. Within 60 calendar days after plugging a well, the permittee shall submit a Plugging and Abandonment report to the Director. The report shall be certified as accurate by the permittee and by the person who performed the plugging operation (if other than the permittee), and shall consist of either:

- (a) A statement that the well was plugged in accordance with the Plugging and Abandonment Plan previously approved by the Director; or
- (b) If the actual plugging differed from the approved plan, a statement defining the actual plugging and explaining the reason for the difference.

14. **Financial Responsibility**

The permittee shall maintain financial responsibility and resources to plug and abandon the underground injection well in accordance with 40 C.F.R. §144.52(a)(7) as provided in of the permit application corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The permittee shall not substitute an alternative demonstration of financial responsibility from that which the Director has approved, unless the permittee has previously submitted evidence of that alternative demonstration to the Director and the Director has notified the permittee in writing that the alternative demonstration of financial responsibility is acceptable. The financial responsibility mechanism shall be updated periodically, upon request of the Director, except when Financial Statement Coverage is used as the financial mechanism, this

coverage must be updated on an annual basis.

15. **Insolvency**

- a. In the event of the bankruptcy of the trustee or issuing institution of the financial mechanism, or a suspension or revocation of the authority of the trustee institution to act as trustee or the institution issuing the financial mechanism to issue such an instrument, the permittee must submit an alternative demonstration of financial responsibility acceptable to the Director within 60 days after such event. Failure to do so will result in the termination of this permit pursuant to 40 C.F.R. §144.40(a)(1).
- b. An owner or operator must also notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 business days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he/she is named as debtor, as required under the terms of the guarantee.

16. **Corrective Action**

The permittee shall shut in the injection well whenever he/she or EPA determines that operation thereof may be causing upward fluid migration through the well bore of any improperly plugged or unplugged well in the area of review and shall take such steps as he/she can to properly plug the offending well(s). Any operation of the well which may cause upward fluid migration from an improperly plugged or unplugged well will be considered a violation of this permit. If the permittee or the EPA determines that the permitted well is not in compliance with 40 C.F.R. §146.8, the permittee will immediately shut in the well until such time as appropriate repairs can be affected and written approval to resume injection is given by the Director. In addition, the permittee shall not commence injection until any and all corrective action has been taken in accordance with any plan contained in Part III(C) of this permit.

17. **Mechanical Integrity**

- a. **Standards** - The injection well must have and maintain mechanical integrity consistent with 40 C.F.R. § 146.8(a)(1) and (2). Mechanical integrity demonstrations must be witnessed by an authorized representative of the Director unless an authorized representative informs the permittee that it is not possible to witness the test.
- b. **Periodic Mechanical Integrity Testing** - The permittee shall conduct the mechanical integrity testing as follows:

- (i) Long string casing, injection tubing and annular seal shall be tested by means of an approved pressure test in accordance with 40 C.F.R. § 146.8(b)(2). This test shall be performed upon completion of this well, and at least once every 60 months beginning with the date of the last approved demonstration and whenever there has been a well workover in which tubing is removed from the well, the packer is reset, or when loss of mechanical integrity becomes suspected during operation;
- (ii) An approved temperature, noise, oxygen activation, or other approved log shall be run upon completion of this well and at least once every 60 months from the date of the last approved demonstration to test for movement of fluid along the bore hole. The Director may require such tests whenever the well is worked over.
- (iii) The permittee may request the Director to use any other test approved by the Director in accordance with the procedures in 40 C.F.R §146.8(d).

c. **Prior Notice and Reporting** - The permittee shall notify the Director of his or her intent to demonstrate mechanical integrity at least 30 calendar days prior to such demonstration. The permittee shall either follow the prescribed test procedures found in Attachment D of this permit or submit written procedures for approval at least 30 calendar days prior to the testing. If the submitted procedures are not appropriate for approval, EPA will require the permittee to submit new proposed test procedures for approval or add appropriate conditions to the submitted procedures. At the discretion of the Director, a shorter time period may be allowed. Reports of mechanical integrity demonstrations which include logs must include an interpretation of results by a knowledgeable log analyst. The permittee shall report the results of a mechanical integrity demonstration as provided in Part II(B)(3)(d) of this permit.

d. **Gauges** - The permittee shall calibrate all gauges used in mechanical integrity demonstrations to an accuracy of not less than one-half percent of full scale, prior to each required test of mechanical integrity. A copy of the calibration certificate shall be submitted to the Director or his or her representative at the time of demonstration and every time the gauge is calibrated. The gauge shall be marked in no greater than five psi increments.

e. **Loss of Mechanical Integrity** - If the permittee or the Director finds that the well fails to demonstrate mechanical integrity during a test, or fails to maintain mechanical integrity during operation, or that a loss of mechanical integrity as defined by 40 C.F.R. §§ 146.8(a)(1) and (2) is suspected during

operation, the permittee shall halt the operation immediately and follow the reporting requirements as directed in Part I(E)(10)(e) of this permit. The permittee shall not resume operation until mechanical integrity is demonstrated and the Director gives approval to recommence injection.

f. **Mechanical Integrity Testing on Request From Director** - The permittee shall demonstrate mechanical integrity at any time upon written notice from the Director.

18. **Restriction on Injected Substances**

The permittee may inject only spent brine into the same formation from which it was withdrawn after extraction of halogens or their salts. Only those fluids from sources noted in the administrative record and approved by the Director shall be injected.

PART II
WELL-SPECIFIC CONDITIONS

A. CONSTRUCTION REQUIREMENTS

1. **Siting**

Notwithstanding any other provision of this permit, the injection well shall inject only into a formation which is separated from any USDW by a confining zone that is free of known open faults or fractures within the area of the review.

2. **Casing and Cementing**

Injection wells shall be cased and cemented to prevent the movement of fluids into or between underground sources of drinking water. The casing and cement to be used in the construction of the well shall be as contained in the Attachments of the permit application corresponding to this permit action which is hereby incorporated by reference as if they appeared fully set forth herein.

3. **Tubing and Packer Specifications**

Injection shall only take place through tubing with a packer set in the long string casing within or below the nearest cemented and impermeable confining system no more than 100 feet above the injection zone. Tubing and packer specifications shall be as represented in engineering drawings contained in the Attachments of the permit application corresponding to this permit action which are hereby incorporated by reference as if they appeared fully set forth herein. Any proposed changes shall be submitted by the permittee in accordance with Part I(E)(10)(a) and (b) of this permit.

4. **Wellhead Specifications**

For every injection well, the operator shall provide a female fitting, with a cutoff valve, to the tubing at the wellhead, so that the amount of injection pressure being used may be measured by a representative of EPA by attaching a gauge having a male fitting.

5. **Logs and Tests**

Upon approval of the surface casing and cementation records by the Director, any logs and tests noted in Part III of this permit shall be performed, unless already provided.

6. **Formation Data**

If not already provided, the permittee shall determine or calculate the following

information concerning the injection formation and submit it to the Director for review and approval, prior to operation:

- a. Formation fluid pressure;
- b. Fracture pressure; and,
- c. Physical and chemical characteristics of the formation.

7. **Prohibition of Unauthorized Injection**

Any underground injection, except as authorized by permit or rule issued under the UIC program, is prohibited. The construction, including drilling, of any well required to have a permit is prohibited until the permit has been issued.

B. OPERATING, MONITORING, AND REPORTING REQUIREMENTS

1. **Operating Requirements**

- a. Beginning on the effective date of this permit, the permittee is authorized to operate the injection well, subject to the limitations and monitoring requirements set forth herein. The injection pressure and injected fluid shall be limited and monitored as specified in Parts I(E)(18) and III(A) of this permit.
- b. Injection at a pressure which initiates fractures in the confining zone or causes the movement of injection or formation fluids into or between underground sources of drinking water is prohibited.
- c. Injection between the outermost casing protecting underground sources of drinking water and the well bore is prohibited.
- d. The annulus between the tubing and the long string casing shall be filled with a liquid designed to inhibit corrosion. The annulus liquid will be monitored in accordance with Parts II(B)(2)(d) and II(B)(3)(b) of this permit. Any specific annulus requirements are contained in Part III(A) of this permit.

2. **Monitoring Requirements**

- a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Grab samples shall be used to obtain a representative sample of the fluid to be analyzed. Part III(A) of this permit describes the sampling location and required parameters for injection fluid analysis. The permittee shall identify the types of tests and methods used to generate the monitoring data. The monitoring program shall conform to the one described in Part III(A) of this permit.

- b. **Analytical Methods** - Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 C.F.R. §136.3 or in Appendix III of 40 CFR Part 261 or by other methods that have been approved by the Director.
- c. **Injection Fluid Analysis** - The nature of the injection fluids shall be monitored as specified in Part III(A) of this permit. An initial analysis of the injection fluid is contained in the Attachments of the permit application corresponding to this permit action which is hereby incorporated by reference as if it appeared fully set forth herein. The Director may, by written notice require the permittee to sample and analyze the injected fluid at any time.
- d. **Injection Pressure, Annulus Pressure, Annulus Liquid Loss, Flow Rate, and Cumulative Volume** - Injection pressure, annulus pressure, flow rate and cumulative volume shall be recorded at least weekly and shall be reported monthly as specified in Part III(A) of this permit. Annulus liquid loss shall be recorded at least quarterly and shall be reported in accordance with the provisions of Part II(B)(3)(b), as the volume of liquid added to the annulus to keep it filled in accordance with Part II(B)(1)(d). All gauges used in monitoring shall be calibrated in accordance with Part I(E)(17)(d) of this permit.

3. **Reporting Requirements**

Copies of the monitoring results and all other reports shall be submitted to the Director at the following address:

**United States Environmental Protection Agency
Attn: Underground Injection Control (WP-16J)
77 West Jackson Boulevard
Chicago, Illinois 60604-3590**

- a. **Monthly Reports** - Monitoring results obtained during each week shall be recorded on a form which has been signed and certified according to 40 C.F.R. §144.32. The first report shall be postmarked no later than the 10th day of the month after authorization to inject has been granted. Thereafter, forms shall be submitted at the end of each month and shall be postmarked no later than the 10th day of the month following the reporting period. This report shall include the weekly measurements of injection pressure, annulus pressure, flow rate, and cumulative volume as required in Parts II(B)(2)(d) and III(A) of this permit.
- b. **Quarterly Reports** - Monitoring results obtained each quarter shall include the measurement of annulus liquid loss as required in Parts II(B)(2)(d) and

III(A) of this permit. Reports shall be submitted at the end of each quarter and shall be postmarked no later than the 10th day of the first month of the following quarter.

- c. **Annual Reports** - Monitoring results obtained each year shall include the measurements of injected fluid characteristics as required in Part III(A) of this permit. Reports shall be submitted at the end of each anniversary year and shall be postmarked no later than the 10th day of the first month of the following year.
- d. **Reports on Well Tests, Workovers, and Plugging and Abandonment** - The permittee shall provide the Director with the following reports and test results within 60 days of completion of the activity:
 - (i) Mechanical integrity tests, except tests which the well fails in which case 24-hour reporting under Part I(E)(10)(e) is applicable;
 - (ii) Logging or other test data;
 - (iii) Well workovers (using EPA Form 7520-19); and
 - (iv) Plugging and abandonment.

PART III
ATTACHMENTS

These special conditions include, but are not limited to plans for maintaining correct operating procedures, monitoring conditions and reporting, as required by 40 C.F.R. Parts 144 and 146. These plans are described in detail in the permittee's application for a permit, and the permittee is required to adhere to these plans as approved by the Director, as follows:

- A. OPERATING, MONITORING, AND REPORTING REQUIREMENTS (ATTACHED)
- B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)
- C. CORRECTIVE ACTION PLAN (ATTACHED)
- D. TESTING PROCEDURES (ATTACHED)

ATTACHMENT A
SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS

Characteristic	Limitation	Minimum Monitoring Requirements		Minimum Reporting Requirements
		Freq.	Type	Freq
*Injection Pressure	609 psig (maximum)	weekly		monthly
Annulus Pressure		weekly		monthly
Flow Rate		weekly		monthly
Cumulative Volume		weekly		monthly
Annulus Liquid Loss		quarterly		quarterly
**Physical and Chemical Composition of Injection Fluid		annually	grab	annually

SAMPLING LOCATION: Wellhead

*The limitation on wellhead pressure serves to prevent confining-formation fracturing. This limitation was calculated using the following formula:

$$[\{0.8 \text{ psi/ft} - (0.433 \text{ psi/ft})(\text{specific gravity})\} \times \text{depth}] - 14.7 \text{ psi}.$$

The maximum injection pressure is dependent upon depth and specific gravity of the injected fluid. The Amherstburg and Bois Blanc Formations at 2630 feet was used as the depth and a specific gravity of 1.35 was used for the injected fluid.

**Chemical composition and physical analysis shall include, but not be limited to, the following: Ammonia Nitrogen, Barium, Bicarbonate, Boron, Bromide, Calcium, Carbonate, Chloride, Lithium, Magnesium, Nitrate Nitrogen, pH, Potassium, Resistivity (ohm-meters @ 75°F), Sodium, Specific Gravity, Sulfate, Sulfide, Strontium, Total Dissolved Solids and Total Iron.

United States Environmental Protection Agency



WELL REWORK RECORD, PLUGGING AND ABANDONMENT PLAN, OR PLUGGING AND ABANDONMENT AFFIDAVIT

Name and Address, Phone Number and/or Email of Permittee

Martin Marietta Magnesia Specialties, LLC
1800 Eastlake Rd, Manistee, MI 49660
(231)723-2577

Permit or EPA ID Number MI-105-5X16-17	API Number 21-105-00018-70-00	Full Well Name Well No. S-34
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State MI	County Mason
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Locate well in two directions from nearest lines of quarter section and drilling unit Latitude 44°06'31"N

Surface Location Longitude 86°20'04"W

165 ft. from (N/S) N Line of quarter section
1150 ft. from (E/W) E Line of quarter section.

Well Class	Timing of Action (pick one)	Type of Action (pick one)
<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input checked="" type="checkbox"/> Class V	<input checked="" type="checkbox"/> Notice Prior to Work Date Expected to Commence NA <input type="checkbox"/> Report After Work Date Work Ended	<input type="checkbox"/> Well Rework <input checked="" type="checkbox"/> Plugging and Abandonment <input type="checkbox"/> Conversion to a Non-Injection Well

Provide a narrative description of the work planned to be performed, or that was performed. Use additional pages as necessary. See instructions.

Cut 7" production casing at 1110'.

Pull 1110' of casing out of the hole.

Cement Retainer #1: 2546' - 2752', 92 sks, 108 cu. ft, 16 ppg

Cement Plug #2: 1110' - 2546', 272 sks, 321 cu. ft, 16 ppg

Cement Plug #3: 10' - 1110', 496 sks, 585 cu ft, 16 ppg

Cement Plug #4: 3' - 10', 10 sks, 10 cu. ft, 16 ppg

Steel plate to be welded on top of casing

Cement plugs to be placed using The Balance Method

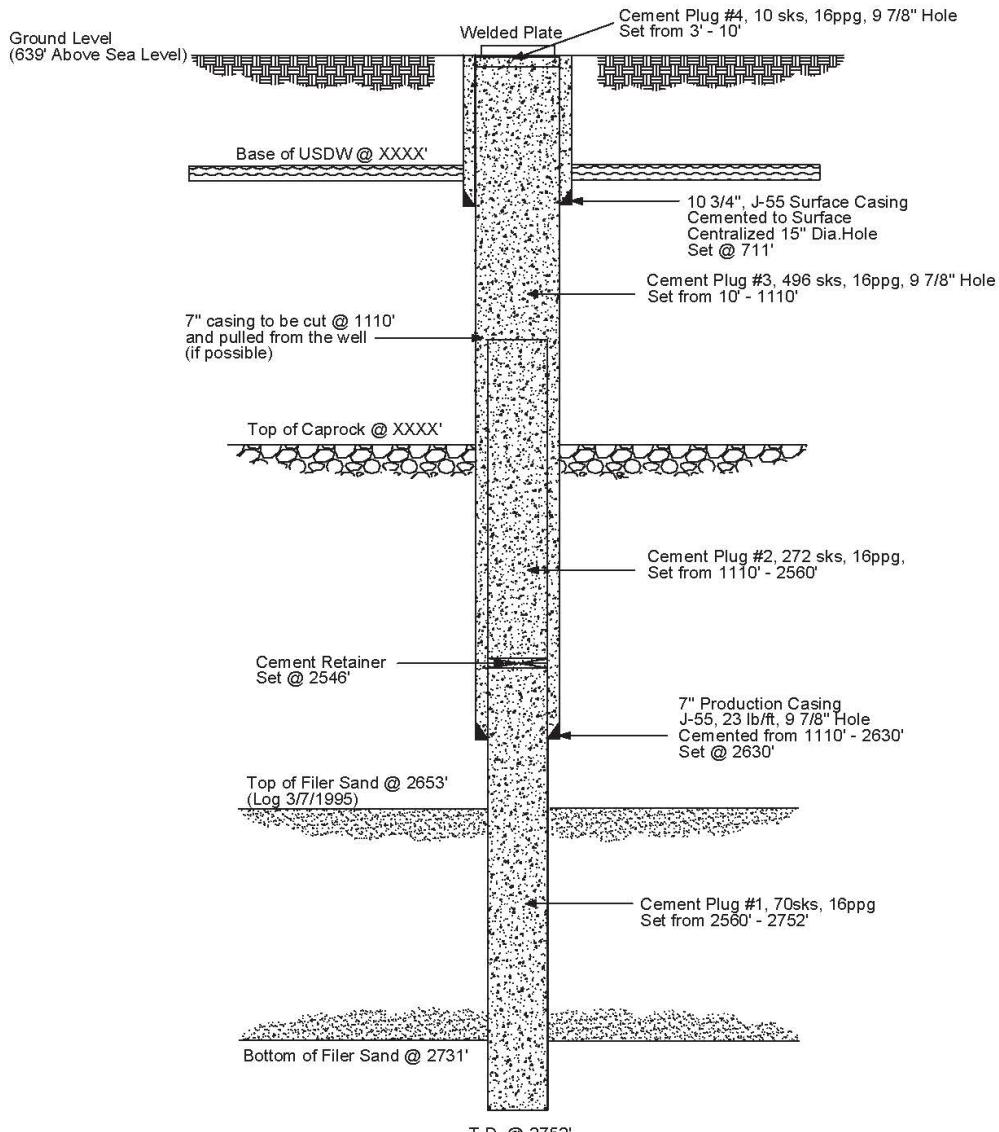
Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR § 144.32)

Name and Official Title (Please type or print) Brad Vernier, VP Operations	Signature Brad Vernier	Date Signed 12/18/23
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EPA Permit NO. MI-105-5X16-17
MI DNR Permit NO. 18-736-853

API NO. 21-105-00018-070-00



Notes:

1. All depths measured from G.L.
2. Reference Client and WSP well permit records
3. Location: NW NE SEC27 T20 R17W
Grant Township, Mason County

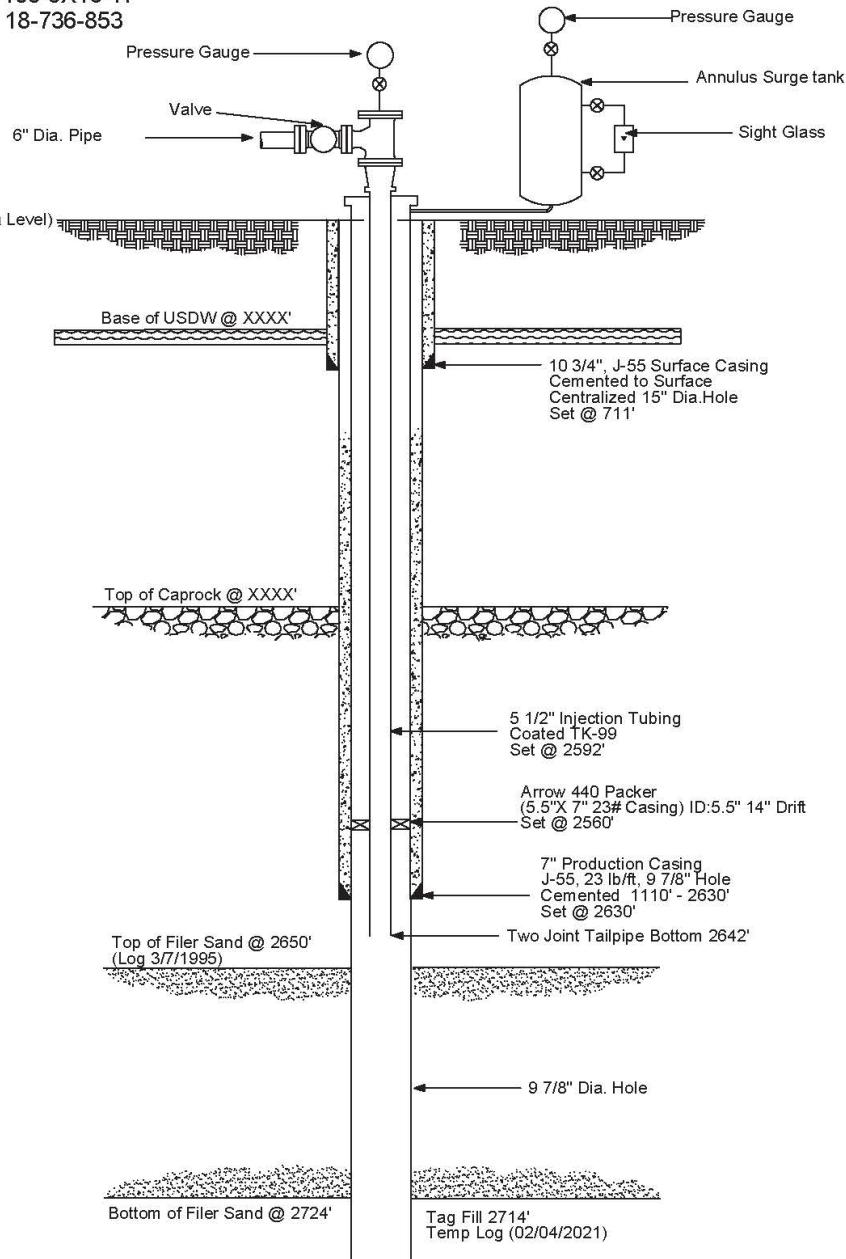


WSP USA Inc.
16200 Park Row Ste. 200
Houston TX 77084
TEL: (281) 589-5900

Martin Marietta
Manistee, Michigan

WELL NO. S-34 P&A SCHEMATIC					JOB. NO. 192044K
DESIGN:	DRAWN: DJS	CHECKED: RS	DATE: 06/14/23	SCALE: NONE	DRAWING NO. FIGURE E.1-2

EPA Permit NO. MI-105-5X16-17
MI DNR Permit NO. 18-736-853



Notes:

1. All depths measured from G.L.
2. Reference Client and WSP well permit records
3. Location: NW NE SEC27 T20 R17W
Grant Township, Mason County



WSP USA Inc.
16200 Park Row Ste. 200
Houston TX 77084
TEL: (281) 589-5900

Martin Marietta
Manistee, Michigan

WELL NO. S-34 WELLBORE SCHEMATIC

JOB. NO.
192044K

DESIGN:	DRAWN: DJS	CHECKED: RS	DATE: 06/05/23	SCALE: NONE	DRAWING NO. FIGURE C-1.2
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ATTACHMENT C
CORRECTIVE ACTION PLAN

No corrective action is required at this time.

ATTACHMENT D
TESTING PROCEDURES

Standard Annulus Pressure Test

1. Ensure the packer is set within 100 feet of the top of the injection zone. Packers not set within 100 feet of the top of the injection zone will be evaluated by EPA on a case-by-case basis. Note any approved deviations from previously reported well construction.
2. Document the test using a mechanical or digital device or a service company job record which records the value of the parameters of interest as measured during the test.
 - a. Submit along with the test results a gauge calibration certificate for the mechanical or digital device used to record test parameters. All calibration (for new or recalibrated gauges) must have been performed within a year prior to the test.
 - b. Place a gauge on the wellhead to measure pressure. If a recording device is used, the recording device serves to verify the data witnessed on the wellhead gauge.
 - c. Use an appropriately scaled mechanical gauge which has a measurement range that is 1.2 – 2 times the maximum pressure measured or a 1 psi resolution digital gauge with sufficient full scale.
 - d. Measure and document pressure using a gauge and/or a digital record and/or a chart record that can be read with sufficient accuracy to identify pressure change which would result in a failure of the test and to record accurate values during the test interval. For example, if the test pressure is 300 psig, the gauge and/or chart record should be marked in increments of 5 psi or less.
3. Verify that the tubing/casing annulus is full of liquid. No unapproved fluid or substance that may affect test outcomes are allowed. Measure and report the volume of liquid added to the annulus during pressurization (if any). If an annulus tank is pressurized with nitrogen to pressurize the well, record the liquid displaced from the tank into the well annulus.
4. Stabilize the temperature of the well and the annulus liquid, either by ceasing injection or injecting at a constant fixed rate. Ensure that the wellhead injection tubing pressure is at least 100 psi different from the annulus test pressure.
5. Pressurize the annulus to the greater of 300 psig or the maximum permitted injection pressure plus 100 psi. A positive pressure differential of greater than 100 psi should be maintained between the annulus and the injection tubing. If EPA does not approve any deviations from this criteria prior to testing, the test results might not be considered a sufficient demonstration of mechanical integrity and a new test would then be needed. A net gain or loss of more than 3% during the test indicates the well does not have mechanical integrity. Following pressurization, isolate the annular system from its pressure source and, if present, the sealpot or surge tank being sure to prevent any leaking across the shut-off valves.
6. Test for at least 60 minutes. Note the time, the annulus pressure, and the injection/tubing pressure at the start of the test and measure and note these same parameters at least every 10 minutes thereafter up to the end of the required test duration.
7. Send a report of the testing including any other data or documents available at the conclusion of the test which support the test results, such as gauge calibration certification, third-party service ticket, and/or original chart/digital recordings, to EPA per the reporting requirements of the permit.
8. If the tested well was reworked in association with the test, submit a rework record.

9. Include the certification statement and signature on the transmittal letter or on the individual MIT results form and, if submitted, the rework record to comply with the requirements of 40 CFR § 144.32(b).

Temperature Log

1. To conduct a static temperature log, the well must be shut in for at least 36 hours, or longer if temperature stabilization based on previous logs requires more time.
2. If the well cannot be shut in for 36 hours, shut in for as long as possible and run two logs at least six hours apart.
3. Calibrate the temperature tool in a bucket of ambient temperature water and a bucket of ice water immediately prior to conducting the test.
4. Log from the top of the well to the bottom, recording both temperature and natural gamma ray activity.
5. Record log data at least once per foot.
6. Logging speed shall not exceed 30 feet per minute. Reduce speed to 20 feet per minute in air-filled well bores.
7. The test shall include a written report by a knowledgeable log analyst. Such report must explain any anomalies shown in the results.
8. The test report shall include an up-to-date well schematic, digital logging data on CD/flash drive/email in a spreadsheet format, and a plot of the logging activity.
9. The test report shall include a tabulation of values for the following background parameters: EPA permit number, long string casing length (ft), tubing and/or tail pipe lowermost depth (ft), top of open hole or uppermost perforation (ft), well total depth (ft), plugged back total depth or top of fill depth (ft), Kelly bushing elevation (ft), depth to top of confining zone (ft), and depth to top of permitted injection zone (ft). The test report shall also include a tabulation of values for the following test specific parameters: test date, depth reference (Kelly bushing or ground level), date of last injection, temperature of last injected fluid (F), elapsed time since last injection (hr), volume injected into the well in the past year (gal), names and depths of any other injection formations used at the site, temperatures logged by the tool and thermometer during calibration (F), depth to fluid level in the tubing (ft), depth to top of receptive strata (ft), and depth to bottom of receptive strata (ft).
10. The test must conclusively demonstrate its objectives and satisfy the Director to be considered a completed test.