

UTAH DIVISION OF WATER QUALITY

CLASS V AREA PERMIT

UNDERGROUND INJECTION CONTROL (UIC) PROGRAM

UIC Permit Number: UTU-27-AP-BDCCF0C

Millard County, Utah

Issued to:

Advanced Clean Energy Storage I, LLC (ACES I)

3165 East Millrock Drive, Suite 330

Holladay, Utah 84121

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Attachment A - General Location Map of the ACES I Storage Project, Millard County.

Attachment B - Map of the ACES Storage Project Area of Review (AOR) including the Class V Hydrogen Injection and Withdrawal Wells and the Permit Area

Attachment C - Hydrogen Storage Cavern Field Operating, Monitoring and Reporting Plan (Draft)

Attachment D - Well and Cavern Closure and Abandonment Plan

Attachment E - Financial Assurance: Memo – Revised Estimated Cost to Plug and Abandon Hydrogen Storage Caverns at Delta, Utah

PART I. AUTHORIZATION TO CONSTRUCT AND INJECT

Pursuant to the Safe Drinking Water Act (SDWA) and Utah Underground Injection Control (UIC) Program Regulations in Utah Administrative Code (UAC) R317-7 and federal regulations incorporated by reference therein the Director of the Utah Division of Water Quality (hereinafter “Director”) hereby authorizes,

Advanced Clean Energy Storage I, LLC
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to operate and maintain Class V injection wells and caverns for the storage of hydrogen gas. This Class V Permit contains requirements for the storage of hydrogen, which begins after individual injection well and cavern systems have been constructed in accordance with UIC Class III Permit No. UTU-27-AP-718D759 in the Project Area centered approximately at UTM Northing: 205364015 (NAD 83, UTM 12, Meters) and UTM Easting: 500135.217 (NAD 83, UTM 12, Meters), located in Millard County, Utah. A general location map is included as Attachment A. The UIC Class V Permit Area is identical to the UIC Class III Permit Area.

The purpose of solution mining activity conducted under the UIC Class III Permit is the construction of underground storage caverns in a thick salt body that exists under the project area. The unique geology of the subsurface limits the area where cavern construction can occur. A two mile area of review (AOR) was defined under the UIC Class III Permit for the identification of any USDWs and artificial penetrations in the project area as required under the provisions in UAC 317-7, Sections 7-3.1(B), 7-3.4, 7-10.1(A)(1), and 7-11 40 CFR 146.6. This UIC Class V Permit regulates the operation, maintenance, monitoring and reporting of the injection and withdrawal of hydrogen from constructed caverns for the storage and retrieval of hydrogen gas. In addition, this permit regulates limited cavern maintenance to address salt creep during operations through the use of freshwater displacement. This permit also provides requirements for hydrogen well and cavern closure and abandonment and financial assurance in the event of ACES I’s insolvency.

Although the Class III UIC Permit No. UTU-27-AP-718D759 regulates cavern construction and this Class V UIC Permit regulates storage of hydrogen in those caverns, both permits shall apply concurrently until the caverns are solution mined to the full extent permitted, to allow construction of individual wells and/or cavern expansion, if applicable, under the Class III UIC Permit while certain wells/storage caverns are operated and maintained under the provisions of this Class V UIC Permit.

Part III (F) of this permit details the process for requesting Director approval to transfer any particular well/storage cavern from the purview of the Class III UIC Permit to this Class V UIC Permit for operation and maintenance, as well as all well/storage caverns that

have moved from the purview of this Class V UIC Permit to the Class III UIC Permit for construction and/or expansion.

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 legal description of the Project Area within which the operation and maintenance of Class V well/storage caverns may occur is included in Attachment B along with maps showing the facility property boundary, the Project Area, and the Area of Review.

This permit does not convey any mineral rights nor does it convey any contractual rights that may be necessary to operate the caverns and/or to store product(s) in the caverns subject to this permit.

All references to, Utah Administrative Code 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 becomes effective. The following are incorporated as enforceable attachments to this permit:

- Attachment A - General Location Map of the ACES I Storage Project, Millard County.
- Attachment B - Map of the ACES I Storage Project Area of Review including the Class III Solution Mining Injection Wells and the Permit Area
- Attachment C - Storage Cavern Field Operating Plan
- Attachment D - Well and Cavern Closure and Abandonment Plan
- Attachment E - Financial Assurance

This 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 April 20, 2022.

This permit and the authorization to inject and store shall be issued for five years and must be renewed prior to expiration as described in Part II D.2 – Duty to Reapply

Signed this 20th day of April, 2022.



John K. Mackey, P.E.
Interim 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, 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. If a claim is asserted, the information will be treated in accordance with 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:

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 (40 CFR 144.51)

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

1. Duty to Comply (40 CFR 144.51(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).

2. Duty to Reapply (40 CFR 144.51(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. This permit 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 (40 CFR 144.51(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 (40 CFR 144.51(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 (40 CFR 144.51(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 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

(40 CFR 144.51(f), 40 CFR 124.5)

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

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 (40 CFR 144.39)

When 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 must be followed.

- (1) Causes for modification. 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 (40 CFR 144.40)

- (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;
 - iv. A change in any condition that requires either a temporary or permanent reduction or elimination of any discharge or disposal practice controlled by the permit.
- (2) The Director shall follow the applicable procedures in 40 CFR 124 in terminating any permit under this section.

c) Minor Modification of Permit (40 CFR 144.41)

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)(3) (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 (40 CFR 144.38)
- (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:

- 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 (40 CFR 144.51(g))

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

8. Duty to Provide Information (40 CFR 144.51(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 (40 CFR 144.51(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 permittee's 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 (40 CFR 144.51(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 (40 CFR 144.51(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 (40 CFR 144.51(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 SDWA and/or the UWQA.
- d) Monitoring Reports. Monitoring results shall be reported at the intervals specified in Part III of this permit.
- e) Compliance Schedules. 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 reoccurrence 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 (40 CFR 144.51(m))

- a) For a new injection well authorized by an 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. (40 CFR 144.51(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 project.

15. Plugging and Abandonment Requirements. (40 CFR 144.51(o))

This Class V Permit shall include conditions for plugging and abandonment that meet the applicable requirements of the SDWA and UAC R317-7 to ensure that plugging and abandonment of wells 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 well and cavern closure and abandonment plan are specified in Part III Section I and Attachment D of this permit including hydrogen storage cavern

closure requirements that are specifically added for this permit in addition to the plugging and abandonment requirements in the Class III Permit.

Plugging and Abandonment reporting requirements (40 CFR 144.51(p)) are specified in Part III Section I of this permit and in the well and cavern closure and abandonment plan found in Attachment D. These requirements apply to both the Class III and Class V permits.

16. Duty to Establish and Maintain Mechanical Integrity. (40 CFR 144.51(q))

- a) The owner or operator shall establish prior to commencing injection or on a schedule determined by the Director, and thereafter maintain mechanical integrity as defined in 40 CFR 146.8.

This Class V Permit imposes the same the Mechanical Integrity requirements as the Class III Permit. Specifically, when the Director determines that a Class V well lacks mechanical integrity pursuant to 40 CFR 146.8, 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 40 CFR 146.8.

- b) The Director may allow the owner/operator of a well which lacks internal mechanical integrity pursuant to 40 CFR 146.8(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 40 CFR 144.36)

This UIC Class V Operating Permit shall be in effect for a period of five (5) years from the date of issuance.

B. COMPLIANCE SCHEDULE
(40 CFR 144.53)

In addition to Part II (D)(13) of this permit, the requirements of the UIC Class III Permit must be met prior to commencing storage under the UIC Class V Permit. Failure to do so may result in the termination of the permit according to Part II(D)(6)(b) of this permit. Before commencing hydrogen storage, the Operator shall submit or complete the following:

1. Well Completion Data / Report

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

- a) All available logging and testing data on the well;
- b) Primary cement calculations and evidence of cement returns to surface;
- c) Results of satisfactory demonstration of mechanical integrity;
- d) Actual maximum injection pressure and injection flow rate;
- e) Results of the formation testing program, if applicable;
- f) Actual solution mining procedures;
- g) Status of all wells requiring corrective action within the area of review, if applicable;
- h) Detailed 'As-Built' Well Schematic including:
 - (1) Casing details including size, weight, grade and setting depths,
 - (2) Cement details including type, special formulations, calculated volumes, actual pumped volumes, and yield (cubic feet / sack),
 - (3) Formation horizons,
 - (4) Ground water horizons,
 - (5) Pilot hole.
- i) Hanging strings shall be removed to complete sonar surveys of the cavern after each solution mining phase and may be replaced with production strings for cavern operations before commencement / re-commencement of product storage

- j) 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
- k) 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,
- l) 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
- m) Written approval from the Director of DWQ to commence / re-commence product storage shall be required.

C. CORRECTIVE ACTION

(40 CFR 144.52(2), 40 CFR 144.55, 40 CFR 146.7)

As of the effective date of this permit no wells have been identified within the area of review for the ACES I Hydrogen Storage Project that require corrective action under the UIC Class III Permit. As the Class V Permit Area coincides with the Class III Permit no additional corrective actions are needed to address artificial penetrations in the Permit Area. Any corrective actions described in this section are specific to hydrogen injection/production wells/caverns encompassed by this UIC Class V Permit.

This UIC Class V Permit contains specific conditions for regulatory oversight of the operation and maintenance of hydrogen injection/production from well/cavern systems and monitoring and reporting for hydrogen migration and leakage. A Corrective action plan will be developed per the operating, monitoring and reporting plan required under Part III Section E of this permit in the event that hydrogen leakage is detected in the well/cavern systems.

D. OPERATING, MONITORING AND REPORTING PLAN

(40 CFR 144.54, and 40 CFR 146.51)

The Storage Cavern Field Operating, Monitoring and Reporting Plan (SCFOMRP) is included as Attachment C of this permit. The SCFOMRP is enforceable as a condition of this UIC Class V Permit.

1. Contents of Storage Cavern Field Operating, Monitoring and Reporting Plan

The SCFOMRP includes provisions governing Operation and Maintenance, Monitoring, Testing and Inspection and Agency Reporting and Notification, and Records Retention.

2. Monitoring Equipment and Methods

In accordance with the SCFOMRP, 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.

3. Required Monitoring and Testing

ACES I shall conduct monitoring and testing to include mechanical integrity testing in accordance with the applicable methods identified in 40 C.F.R. § 146.33 and 40 C.F.R. §146.8 and Class III Permit requirements during operations to ensure a stable shape and configuration is maintained, and to ensure the Required Pillar Width is maintained. Monitoring and testing reports should be submitted with Class V reports to the extent necessary to comply with the conditions and enforcement of the Class V Permit but duplicate Class III and Class V reporting is not necessary.

4. Operating Requirements

a) Cavern Configuration, Spacing, and Standoff Requirements

Each cavern shall be developed and spaced with sufficient salt back (salt above the roof of the cavern), standoff (set back from the boundary of the salt body) and set back from the permit area boundary to maintain during operations mechanical integrity of the caverns, containment of hydrogen gas through the salt web (the in-situ mass separating adjacent underground caverns and caverns and the edge of the salt body), and migration of hydrogen through the overburden during all modes of cavern development, operation and abandonment for the lifetime of the facility.

ACES I shall maintain at all times, including but not limited to, cavern siting, development, expansion, and operation, a salt roof thickness equal to 75 percent of the maximum cavern height or depth, minimum spacing between all hydrogen storage caverns of a two-to-one (2:1) pillar-to-diameter ratio (P:D), which is the equivalent of a three-to-one (3:1) center-to-center or S:D ratio, where S is the distance between the centers of two caverns or between a cavern and the edge of the salt body, D is the average of the maximum diameter of the two caverns, and P is the minimum pillar thickness between adjacent caverns (the "Required Pillar Width").

The Required Pillar Width for the storage cavern field shall be defined by a geomechanical analysis required by Part III.D.2 of the Class III UIC Permit.

b) 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.

In accordance with 40 CFR Part 146 and 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, ACES I has completed additional geomechanical testing for hydrogen storage that indicates .85 psi/ft is the recommended maximum operating pressure gradient. Therefore, ACES I shall provide additional protection by operating at pressure gradients below 0.85 psi/ft of depth as follows:

- (1) The typical operating pressure gradient of a cavern will be 0.55 psi/ft of depth to the last cemented casing seat.
- (2) The maximum allowable operating pressure gradient (MaxAOPG) will not be greater than 0.80 psi/ft of depth to the last cemented casing seat, unless ACES I submits for approval a geomechanical analysis providing justification for a higher MaxAOPG and providing a safety factor. A higher MaxAOPG shall not be implemented without written approval from the Director. At no time will the caverns be subjected to pressures above the approved MaxAOPG including pressure pulsations and during abnormal operating conditions.
- (3) The maximum allowable MIT test pressure gradient will not exceed 0.85 psi/ft of depth to the last cemented casing seat.
- (4) The hydrogen storage specific operating pressures specified in subsections i through iii above are within the allowable pressures for solution mining under the Class III Permit so there will be no exceedance of pressure limits within the cavern or along the length of the well casing during solution mining or hydrogen storage and withdrawal under Class V Permit operations.

c) 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. ACES I shall maintain a MinAOPG of 0.30 psi/ft of depth based on the geomechanical analysis of the salt formation in the MH-1 exploratory well and an additional factor of safety for hydrogen storage.

d) Borehole – Casing Annulus Injection Prohibited

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

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

1. Quarterly Monitoring Reports

a) Schedule for Submitting Quarterly Monitoring Report

<u>Quarter</u>		<u>Report Due On:</u>
1 st Quarter	January 1 – March 31	April 30
2 nd Quarter	April 1 – June 30	July 31

3 rd Quarter	July 1 – September 30	October 31
4 th Quarter	October 1 – December 31	January 31

b) Content of Quarterly Monitoring Reports

- (1) Quarterly monitoring reports shall be provided for product injection/withdrawal. The report will track any inventory that is injected and withdrawn to confirm an inventory balance. Appendix D provides the methodology and the inventory report form.
 - i. If a discrepancy over 5% is identified by the inventory verification, an internal evaluation shall be initiated within 24-hours to determine the cause. If a discrepancy of 8% or more is identified by the inventory verification, an internal evaluation will be initiated within 24-hours to determine the cause and a summary report with the results of any storage cavern internal evaluation will be submitted to DWQ within 30 days after completion.
- (2) Subsidence monitoring survey results will also be provided quarterly moving to annually after the first year of operations.
 - i. In the event a surface elevation change is detected that is in excess of 0.50 foot since the previous survey, DWQ, SITLA and Millard County will be notified within 24 hours.

2. Annual and Supplemental Reports

- a) Submittal of annual reports will be with the first quarterly report submittal described in F(1) above.
- b) Content of the annual and supplemental reports are described in the SCFOMRP Attachment C of this Permit and are consistent with the applicable monitoring and testing outlined in 40 C.F.R. § 146.33 and acceptable industry standards for the operation of solution mined salt caverns.

3. Endangering Noncompliance Reporting

- a) The permittee shall report to the Director any noncompliance that may endanger health or the environment, as specified in Part II Section D.12.f of this UIC Class V Permit. 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) 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

a) If a well/cavern system is required to be closed and abandoned the following requirements shall apply:

- (1) 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:
 - (2) A statement that the well was plugged in accordance with the Well and Cavern Closure and Abandonment Plan (Attachment D), required by Part III (I) of this permit, previously submitted to, and all conditions of approval provided by, the Director; or
 - (3) If the actual closure and abandonment needs to deviate from the approved plan(s), the permittee shall submit a statement and diagrams defining the proposed closure and abandonment and why the Director should approve such deviation. Any unapproved 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.

F. NOTICE PROCEDURES FOR IDENTIFYING APPLICABLE UIC PERMIT

1. Notice of Applicable UIC Permit

Because this Class V UIC Permit governs operations and maintenance of the well/cavern systems and the Class III UIC Permit governs construction and development of the well/cavern systems, ACES I shall request director approval when it intends to move from construction under the Class III UIC Permit to operations under this Class V UIC Permit. Such request may concern one particular well/cavern system or multiple well/cavern systems.

a) The request shall identify the Well(s)/Cavern System(s) that are moving from construction to operation. ACES I shall identify particular well(s)/cavern system(s) that will be commencing operations at least thirty (30) days prior to commencing product storage, including a Well/Cavern Completion Report required under the UIC Class III solution mining permit consisting of:

- (1) All available logging and testing data on the well/cavern system not previously submitted with the well completion report;
- (2) Results of mechanical integrity testing for well/cavern system;
- (3) Detailed 'As-Built' well/cavern schematic including any changes made to the original well 'As-Built' schematic;
- (4) Sonar survey of the cavern including floor and roof surveys;

b) Director's Approval to Commence Operations within the Well / Cavern System
Within 14 days after receiving the Request and all components of the Well/Cavern Completion Report required by a) above, the Director shall provide written notice granting or denying approval to commence operations under this permit.

c) Application of Class V Permit

ACES I shall comply with all requirements of this Class V UIC Permit and DWQ orders prior to the commencement of product storage, if applicable as explained in Part I of this permit.

2. Re-Commencing of Construction of Individual Well/Cavern System

a) In the event ACES I desires to re-commence active solution mining of a cavern previously in operation under this Class V UIC permit, ACES I shall submit a letter requesting Director approval to inject water into the well/cavern(s) for solution mining under the concurrently open Class III UIC Permit at least sixty (60) days prior to re-commencing solution mining. The letter shall include, as attachments:

- (1) Previous history of freshwater enlargement.
 - (2) A chronology of all geophysical surveys/tests conducted during the time the cavern was released from this permit including a brief summary of the results.
 - (3) Reports of any mechanical integrity tests and sonar surveys that were conducted during the time the cavern was released from this permit.
 - (4) An updated, current tabulation of the information required in Part III (F)(1)(b)(7) of this permit
 - (5) Other relevant information that may affect the DWQ's decision to authorize injection under the UIC Class III Permit.
- b) ACES I shall conduct monitoring and testing to include mechanical integrity testing every 5 years in accordance with the applicable methods identified in 40 C.F.R. § 146.33 and 40 C.F.R. §146.8 as required under the UIC Class III Permit. The same report should be submitted with Class V reports to the extent necessary to comply with the conditions and enforcement of the Class V Permit but duplicate sonar surveys are not necessary.
 - c) ACES I shall conduct and submit a report of a sonar survey of the entire individual well/cavern system from the last cemented casing to the cavern floor as required every 5 years or otherwise as required under the UIC Class III Permit. The same report should be submitted with Class V reports to the extent necessary to comply with the conditions and enforcement of the Class V Permit but duplicate sonar surveys are not necessary.
 - d) DWQ shall review all information required in this section including any requests for variance. The Director shall provide written notice denying or granting approval to re-commence active solution mining within the 60-day period indicated in a) above.
 - e) No solution mining shall occur if the UIC Class III Permit is not current. However, ACES I shall be permitted under this Permit to inject freshwater injection during UIC Class V Draft Permit operations of hydrogen storage and withdrawal solely for the purpose of cavern maintenance only to recover storage volume capacity associated with salt creep. The amount of volume recovery is limited to no more than 10 percent under this permit.
 - f) The hydrogen storage specific operating pressures specified in Part III, Section E.4.b, subsections i through iii, and in Part III, Section E.4.c above are within the allowable pressures for solution mining under the Class III Permit so there will be no exceedance of pressure limits within the cavern or along the length of the well casing during solution mining or hydrogen storage and withdrawal under Class V Permit operations if the UIC Class III Permit is not current.

G. MECHANICAL INTEGRITY

(R317-7-10.3(B) and 40 CFR 146.8)

1. Class V Injection Well Mechanical Integrity Standards

Mechanical integrity testing requirements for each Class V well are those set forth in R317-7-10.3(B) and 40 CFR 146.8. 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

ACES I shall employ one or more of the approved testing methods set forth in 40 CFR 146.8 to demonstrate MI of the well / cavern system during cavern operations. The approved methods are described in the SCFOMRP.

3. 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.

4. 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.

5. 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 34 UIC Permit No. UTU-27-AP-718D759 Final intent to demonstrate MI, no less than 14 days prior to the intended demonstration.

H. WELL AND CAVERN CLOSURE AND ABANDONMENT

(40 CFR 146.10 and R317-7-10.5)

1. Closure and Abandonment Requirements

If a hydrogen injection/production well or well/cavern system operating under this UIC Class V Permit is required to be plugged and abandoned, ACES I shall execute the approved Well and Cavern Closure and Abandonment Plan (Attachment D). The document is informed by the "Cavern Well Abandonment Techniques Guidelines Manual" issued by the Solution Mining Research Institute

(SMRI) provides guidance in the preparation of an appropriate Well and Cavern Closure Plan and at a minimum, the plan shall include monitoring of the cavern pressure and cavern volume during the waiting period required for the brine and cavern to reach static equilibrium before plugging and abandoning the well. The plan shall also include continued subsidence monitoring of the cavern for 10 years after the plugging and abandonment of the cavern well. The approved Well and Cavern Closure and Abandonment Plan shall become an enforceable attachment to this permit. The hydrogen storage cavern specific closure actions which must be performed by ACES I prior to release from this permit, including but not limited to financial assurance obligations are outlined in Attachment D. These and all other closure actions that pertain to both the Class III and V permits are specified in Attachment D.

I. FINANCIAL RESPONSIBILITY

(R317-7-9.1(24) and 40 CFR 144.52)

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 financial assurance instrument(s) acceptable to the Director to implement the approved Well and Cavern Closure and Abandonment Plan (Attachment D) required by this permit. Evidence of adequate financial assurance has been provided in accordance with the requirements of the UIC Class III Permit and is also attached to this permit as an enforceable condition as Attachment F.

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.

J. ADDITIONAL CONDITIONS
(40 CFR 144.52)

1. Geomechanical Analysis and Reassessment

Any geochemical processes that are detected during operations that may affect cavern stability during Class V operations requires additional analysis and reassessment of cavern stability as prescribed in the conditions of UIC Class III Permit Part III Section K and 40 CFR 144.52 and as set forth in the SCFOMRP.