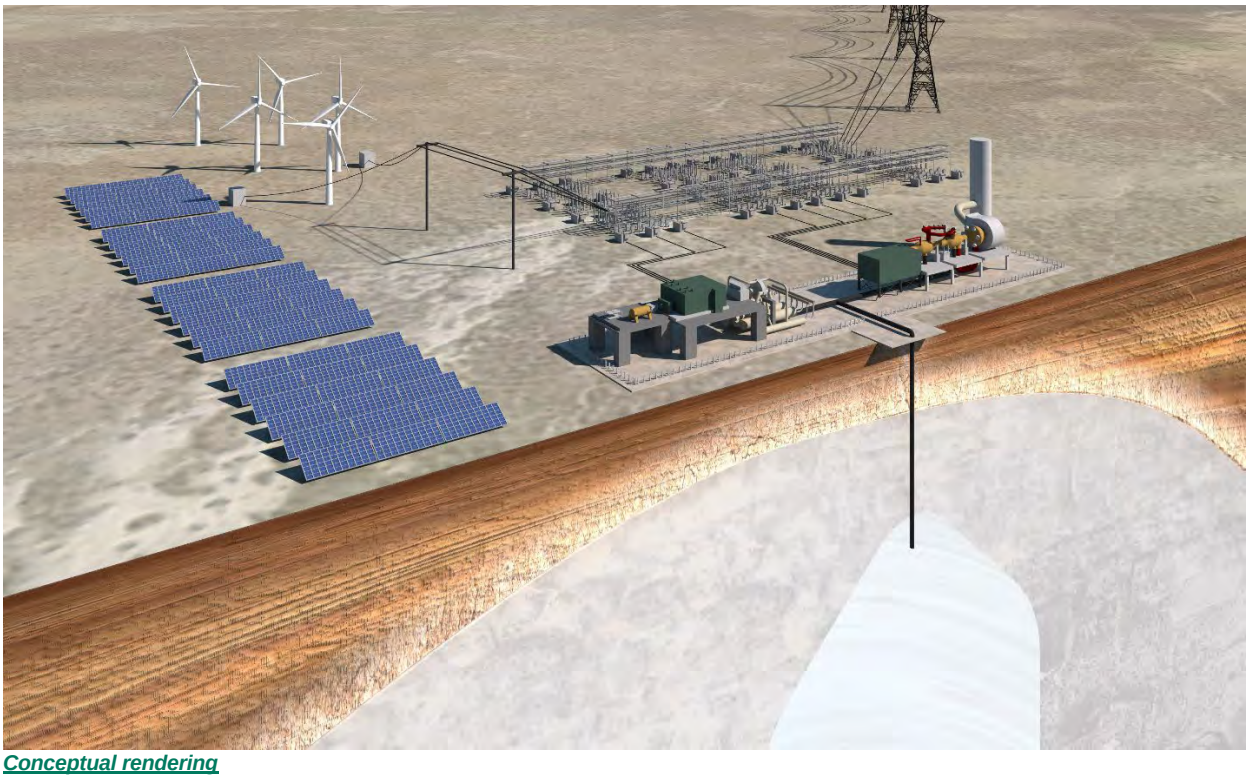

*Conceptual rendering*

# ENVIRONMENTAL ASSESSMENT
# Advanced Clean Energy Storage Project

Department of Energy, Loan Programs Office
Title XVII Program

APRIL 2022

**DOE/EA-2182**

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## Acronyms and Abbreviations

| | |
|---|---|
| ACES | Advanced Clean Energy Storage I, LLC |
| Applicant | Advanced Clean Energy Storage I, LLC |
| BGEPA | Bald and Golden Eagle Protection Act |
| bgs | below ground surface |
| BMP | best management practice |
| BTU | British Thermal Unit |
| CEQ | Council on Environmental Quality |
| CFR | Code of Federal Regulations |
| $CH_4$ | methane |
| $CO_2$ | carbon dioxide |
| DMAD | Delta, Melville, Abraham and Deseret |
| DNR | Department of Natural Resources |
| DOE | U.S. Department of Energy |
| DWQ | Division of Water Quality |
| CPE | corrugated chlorinated polyethylene |
| DWRi | Division of Water Rights |
| DOE | U.S. Department of Energy |
| EA | Environmental Assessment |
| ECDs | erosion control devices |
| EHS | Environment, Health and Safety |
| EIS | Environmental Impact Statement |
| EJ | Environmental justice |
| EPC | Engineering, Procurement, and Construction |
| EPCM | Engineering, Procurement, Construction, and Management |
| EPA | U.S. Environmental Protection Agency |
| EPAct | Energy Policy Act of 2005 |
| ESA | Endangered Species Act |
| ESD | Emergency Shut Down |
| ESG | Environmental, Social and Governance |
| FEED | Front-End Engineering Design. |
| EPC | Engineering, Procurement and Construction |
| EPCM | Engineering, Procurement, Construction and Management |

| | |
|---|---|
| FERC | Federal Energy Regulatory Commission |
| FONSI | Finding of No Significant Impact. |
| ft | Feet |
| GHG | greenhouse gas |
| gpm | gallons per minute |
| HDPE | high-density polyethylene |
| HFCs | hydrofluorocarbons |
| IFC | International Finance Corporation |
| IPA | Intermountain Power Agency |
| IPaC | Information for Planning and Consultation |
| IPP | Intermountain Power Plant |
| kV | kilovolts |
| LCRS | Leak Collection and Recovery System |
| LPO | Loan Programs Office |
| Magnum | Magnum Development |
| MBTA | Migratory Bird Treaty Act |
| MIT | Mechanical Integrity Test |
| mph | miles per hour |
| MW | megawatt |
| $N_2O$ | nitrous oxide |
| NATA | National Air Toxics Assessment |
| NEPA | National Environmental Policy Act |
| NRHP | National Register of Historic Places |
| O&M | Operation and Maintenance |
| OSHA | Occupational Safety and Health Administration |
| PCMS | Process Component Monitoring System |
| PFCs | perfluorocarbons |
| PHA | Process Hazard Analysis |
| Project | ACES I Project |
| PSM | Process Safety Management |
| QA/QC | Quality Assurance/Quality Control |
| QMP | Quality Management Plan |
| RMP | Risk Management Plan |
| SCADA | Supervisory Control and Data Acquisition |
| SCFOMMP | Storage Cavern Field Operating, Monitoring and Maintenance Plan |
| $SF_6$ | hexafluoride |
| SGCN | Species of Greatest Conservation Need |
| SHPO | State Historic Preservation Office |
| SID | Safety in Design |
| SITLA | School and Institutional Trust Lands Administration |
| SPCC | Spill Prevention Control and Countermeasure |
| SR- | State Route |
| SWPPP | Stormwater Pollution Prevention Plan |
| U.S. | United States |
| UDEQ | Utah Department of Environmental Quality |
| UDNR | Utah Department of Natural Resources |
| UDWR | Utah Division of Wildlife Resources |
| UIC | Underground Injection Control |
| UOSHA | Utah Occupational Safety and Health Act |
| USDW | underground source of drinking water |
| USFWS | U.S. Fish and Wildlife Service |

# 1.0 PURPOSE AND NEED

## 1.1 Introduction

Title XVII of the Energy Policy Act of 2005 (EPAct) established a federal loan guarantee program for certain projects that employ innovative technologies. EPAct authorizes the Secretary of Energy to make loan guarantees available for those projects. Specifically, Title XVII identifies the projects as those that "avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases; and employ new or significantly improved technologies as compared to commercial technologies in service in the United States at the time the guarantee is issued."

Advanced Clean Energy Storage I, LLC (ACES or the Applicant) has applied for a loan guarantee pursuant to the U.S. Department of Energy's (DOE) Renewable Energy Project and Efficient Energy Projects Solicitation (Solicitation Number: DE-SOL-0007154) under Title XVII, Innovative Energy Loan Guarantee Program, authorized by the EPAct. The primary goal of the Renewable and Efficient Energy Projects program is to finance projects and facilities in the United States (U.S.) that employ innovative and renewable or efficient energy technologies that avoid, reduce, or sequester anthropogenic emission of greenhouse gases (GHGs).

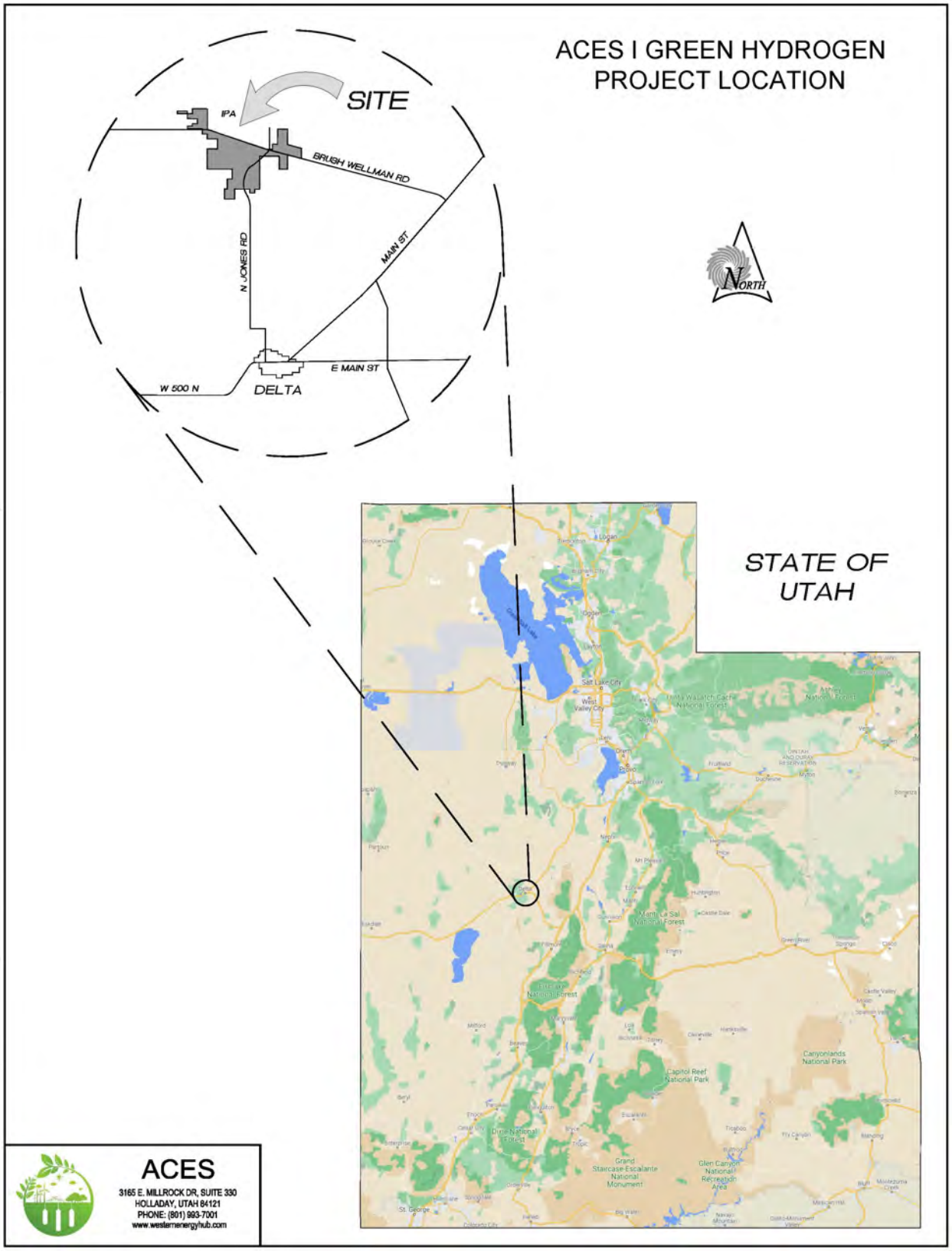
## 1.2 Purpose and Need for Agency Action

The purpose and need for agency action are to comply with DOE's mandate under the EPAct by selecting eligible projects that meet the goals of the act. The DOE Loan Programs Office (LPO) has determined that the ACES I Project (Project) as proposed by the Applicant is eligible pursuant to Section 1703 of the EPAct, and that it complies with DOE's mandate as defined in the act. DOE is using the National Environmental Policy Act (NEPA) process to assist in determining whether to issue a loan guarantee to the Applicant to support the Project.

The Applicant is proposing to produce hydrogen from water using primarily renewable energy sources and store it in four new caverns solution mined within a large salt formation underlying the Project site, which is located near Delta, Utah (**Figure 1**). The Applicant's objective is to provide hydrogen to the adjacent Intermountain Power Plant (IPP) as part of its Hydrogen Supply Project. The Intermountain Power Agency (IPA), which owns IPP, is a group of public utilities that supply power to municipalities in California, Utah, Wyoming, Colorado, and Arizona. In the near term, IPP is planning to replace its existing coal-fired electric generation units with new natural gas–fired electric generation units. The Applicant's hydrogen will be used for long-term seasonal storage and will be blended with natural gas to reduce the IPP facility's carbon footprint. The Applicant's hydrogen will be used by IPP beginning at commissioning in 2025 for a fuel mixture of 30 percent hydrogen and 70 percent natural gas, moving to 100 percent hydrogen by 2045.

IPP's use of hydrogen produced and stored by the Applicant will reduce criteria air pollutant emissions such as ozone precursors and particulate matter and will reduce emissions of GHGs that contribute to global climate change, as is consistent with the primary goal of the Title XVII Program. Financially supporting the Project would help bring hydrogen to market and into greater use, thereby reducing overall national emissions of air pollutants and human-caused GHGs.

## Figure 1. Project Location



## 1.3 Background

The Applicant is ACES, a wholly owned subsidiary of ACES Delta, LLC, collectively referred to as ACES. ACES is a joint initiative of Magnum Development (Magnum), Mitsubishi Power, and Haddington Ventures. The Applicant and Magnum collectively control the only known domal-style salt geologic structure (salt dome) in the Western U.S., encompassing approximately 4,810 acres directly adjacent to the IPP near Delta, Utah. The salt dome is large enough to support more than 70 caverns, each of which could store up to 5,500 metric tonnes of hydrogen. The Applicant has spent the past 3 years (2020, 2021, 2022) obtaining the necessary state and local permits and approvals for the Project, as well as preparing Project design and cost estimate. The Project will safely and cost-effectively produce and store hydrogen in four solution mined storage caverns to support the integration of variable/excess renewable energy from the electric grid and the conversion of the IPP from coal to hydrogen gas fuel.

To fund the construction and initial operation of the Project, the Applicant has applied to the DOE loan program for financial assistance. DOE LPO has reviewed and determined that the application submitted by the Applicant is substantially complete, and the Applicant has accepted and entered into LPO's due diligence process.

## 1.4 Scope of Environmental Assessment

This Environmental Assessment (EA) presents information on the potential impacts associated with DOE guaranteeing a loan to the Applicant and covers the construction and operation of the completed Project. DOE has prepared this EA to comply with NEPA, Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] Parts 1500−1508), and DOE NEPA Implementing Procedures (10 CFR Part 1021). If no significant impacts are identified during preparation of this EA, DOE will issue a Finding of No Significant Impact (FONSI). If potentially significant impacts are identified, DOE will prepare an Environmental Impact Statement (EIS). In addition to complying with NEPA, this EA will also be used by the Applicant's debt and equity funding sources to assist in determining if the Project meets the International Finance Corporation's (IFC) Performance Standards in accordance with the Equator Principles (see https://equator-principles.com/app/uploads/The-Equator-Principles_EP4_July2020.pdf). Like NEPA, the IFC process evaluates a Project's potential significant adverse environmental and social risks and/or impacts as a criterion for determining whether to fund an Applicant.

The Project will be constructed in two phases between 2022 and 2026. It is currently anticipated that the start of Phase 2 construction will overlap with Phase 1 construction and operations. The major components of Phase 1 include: 220 megawatts (MW) of electrolyzers, two storage caverns, two brine evaporation ponds, and associated ancillary support facilities. The major components of Phase 2 include: 330 MW of electrolyzers, two additional storage caverns, and associated ancillary support facilities. Phase 1 construction will begin in 2022, and the first 220 MW of hydrogen generation capacity and one storage cavern will be placed into operation in 2024. Phase 2 construction is expected to begin in 2025 and be completed by 2026, but the actual timing could be later depending upon market demand for the hydrogen.

Several factors were reviewed to determine the scope of issues and resources for analysis in this EA, and to identify non-significant issues and resources. The Project is within the existing fence line of the larger ACES Delta property, which is an active master-planned industrial development site that Millard County has designated as a Heavy Industrial zone. The construction associated with the Project is located in or adjacent to areas that have sustained previous surface disturbance from past industrial development and historic use of the property for cattle grazing. In addition, the larger ACES property has been subject to two NEPA analyses in association with a previously approved but not constructed natural gas storage facility (Magnum Gas Storage Project). Adjacent to the larger ACES property is the Sawtooth Caverns, LLC (Sawtooth) natural gas liquids and refined products storage facility. The Sawtooth facility was previously owned by Magnum and was also subject to environmental review by the state jurisdictional agencies prior to construction.

Both the current Project and the two previously approved projects are centered around the construction of large-scale solution mined storage caverns in a subsurface salt dome underlying the larger ACES property. As such, the potential environmental impacts of each of the projects are similar because each is composed of nearly identical facilities. The facilities common to all three include:

- Storage caverns constructed through solution mining
- Large-scale brine evaporation ponds
- Ancillary support facilities:
    - Pipelines for the transportation and delivery of the various stored products
    - Water and brine pumping and delivery systems
    - Distribution and high-voltage electric systems
    - Communication systems

The only unique facilities for the current Project are a hydrogen generation plant that consists of electrolyzer units and other mechanical equipment that will be operated with renewable energy and water to create hydrogen through an electrochemical process.

In 2010 and 2015, the Federal Energy Regulatory Commission (FERC) analyzed the potential environmental impacts for the common facilities as part of the Magnum Gas Storage Project approval process. This proposed Magnum project contained lands adjacent to and overlapping the current Project site. In each case, the FERC prepared an EA. The 2010 EA analyzed the construction and operation of four salt caverns and associated facilities for natural gas storage, and the 2015 EA analyzed an amended proposed action, which also included the construction and operation of four salt caverns for natural gas storage in a different location within the same 2010 EA project area. The 2010 FERC EA and associated 2011 FERC Order and 2015 EA and associated 2016 FERC Order can be found at https://elibrary.ferc.gov/eLibrary/search under Docket CP10-22-000, Accession Nos. 20101123-4001 and 20110317-3009 and Docket CP16-18-000, Accession Nos. 20160729-4003 and 20161117-3037, respectively. Given the similarities between the scope of the current Project and the Magnum Gas Storage Project, the information and findings contained in the prior FERC EAs are incorporated by reference.

In the 2011 and 2016 Orders documenting the conclusions of the prior EAs, FERC concluded that, provided the facility is constructed in accordance with the environmental conditions specified in the Orders, it would not constitute a major federal action significantly affecting the quality of the human environment. Specifically, the prior EAs presented a detailed analysis of the potential impacts of facility construction, operation, and maintenance to key social and environmental resources including:

- Geology and mineral resources
- Surface water and groundwater
- Biological resources (soils, vegetation, and wildlife)
- Land use and visual resources
- Cultural resources and Native American Tribes
- Socioeconomics and transportation
- Air quality and noise
- Reliability and safety

In each case, the use of and impact on these resources were demonstrated to be minimal due to the Project design and the construction, operations, and maintenance plans that met or exceeded the applicable federal, state, and local safety, design, and environmental protection regulations, codes, and standards. For instance, the underground injection wells installed to construct and operate the storage caverns were designed with multiple cemented casings to protect underground sources of drinking water

(USDWs) that are above the salt formation where the caverns were to be solution mined. Further, the groundwater rights approved by the State Engineer to solution mine the storage caverns were reallocated surplus water rights that were leased from local municipalities and farmers so as not to increase the overall production of groundwater from the local aquifer system. In addition, the lease payments for the surplus water rights served as an economic stimulus for the rural community.

The brine evaporation pond design included similar redundant design features to ensure the protection of USDWs beneath the Project site. The ponds were designed with a "zero-discharge" goal by incorporating two pond liners separated by an interstitial space that would allow any leakage through the top liner to drain to a sump at the corner of the pond. Beneath the bottom liner was also an engineered grade with a network of drainage pipes that would allow any leakage to collect and drain to a sump at the same corner of the pond. Both sumps would be equipped with a pumping system to return any collected brine back into the pond, thereby creating three layers of protection similar to a facility managing hazardous waste.

In addition to the two FERC EAs, the Applicant has already obtained the key state and local permits needed to construct and operate the Project. Similar to the 2010 and 2015 FERC EAs, these permitting processes involved rigorous agency reviews of application materials that included environmental and technical studies. Jurisdictional agencies used these studies as a basis for their respective determinations that the Project design protected the safety, health, and welfare of the public and the environment. Most of the permit processes also required public comment periods and public hearings prior to an agency issuing the permit. Project permits that have been issued include a Class III Underground Injection Control (UIC) Permit for construction of the caverns, a Groundwater Discharge Permit for the construction and operation of the ponds, and a County Conditional Use Permit authorizing the land use. A list of the permits required for the Project is included in Appendix A.

Based on the review and findings of the FERC EAs and their relevance and applicability to the current Project, as well as permits and authorizations that have been issued for the current Project, impacts on the following resources would not be significant and therefore are not included in the scope of this EA:

- Air quality
- Fishery resources and aquatic habitats
- Floodplains
- Geology and minerals
- Soils
- Land use
- Transportation

In addition to these resources, wetlands and waters of the U.S. resources are not included in the scope of the EA because field surveys have confirmed none are present within or adjacent to the Project site. Consultation with the U.S. Army Corps of Engineers in accordance with Section 404 of the Clean Water Act has resulted in an agency determination that the Project area does not contain jurisdictional waters or wetlands (see Appendix A).

Because the Project will be constructed in two phases, this EA assesses the maximum extent of the construction and operation of both Phase 1 and Phase 2. Any potential impacts from implementing only the Phase 1 scenario would be bounded by, and less than, the maximum Project assessed in this EA.

This EA describes the Project and its potential impacts on multiple resource areas that could result from construction and operation of the new facility. These resource areas were identified as potentially having impacts as a result of the Project, and each was assessed to determine the nature, extent, and significance of those impacts (see Section 3.0, Environmental Consequences). The assessment combined desktop research and analysis of existing available information with select field studies, including site assessments related to the presence/absence of special-status species and cultural resources.

The resource areas included for assessment in the scope of this EA include:

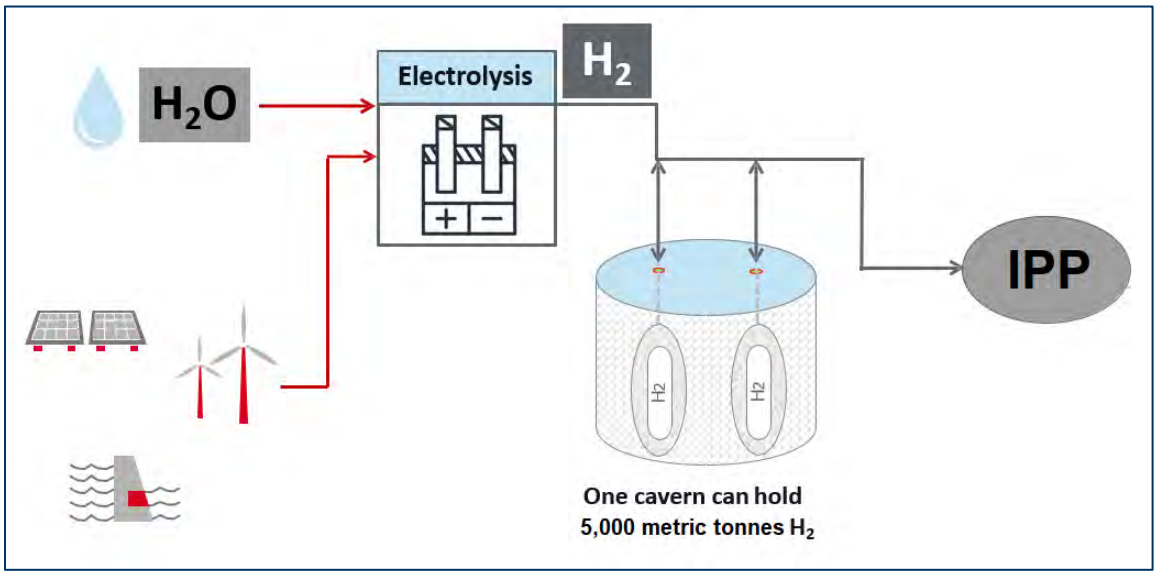
- Climate change – GHG emissions
- Water resources
- Biological resources (threatened and endangered species, general vegetation and wildlife, and migratory birds)
- Cultural resources, including Native American interests
- Socioeconomics and environmental justice (EJ)
- Public and occupational health and safety
- Waste management

## 2.0 DESCRIPTION OF THE PROPOSED ACTION

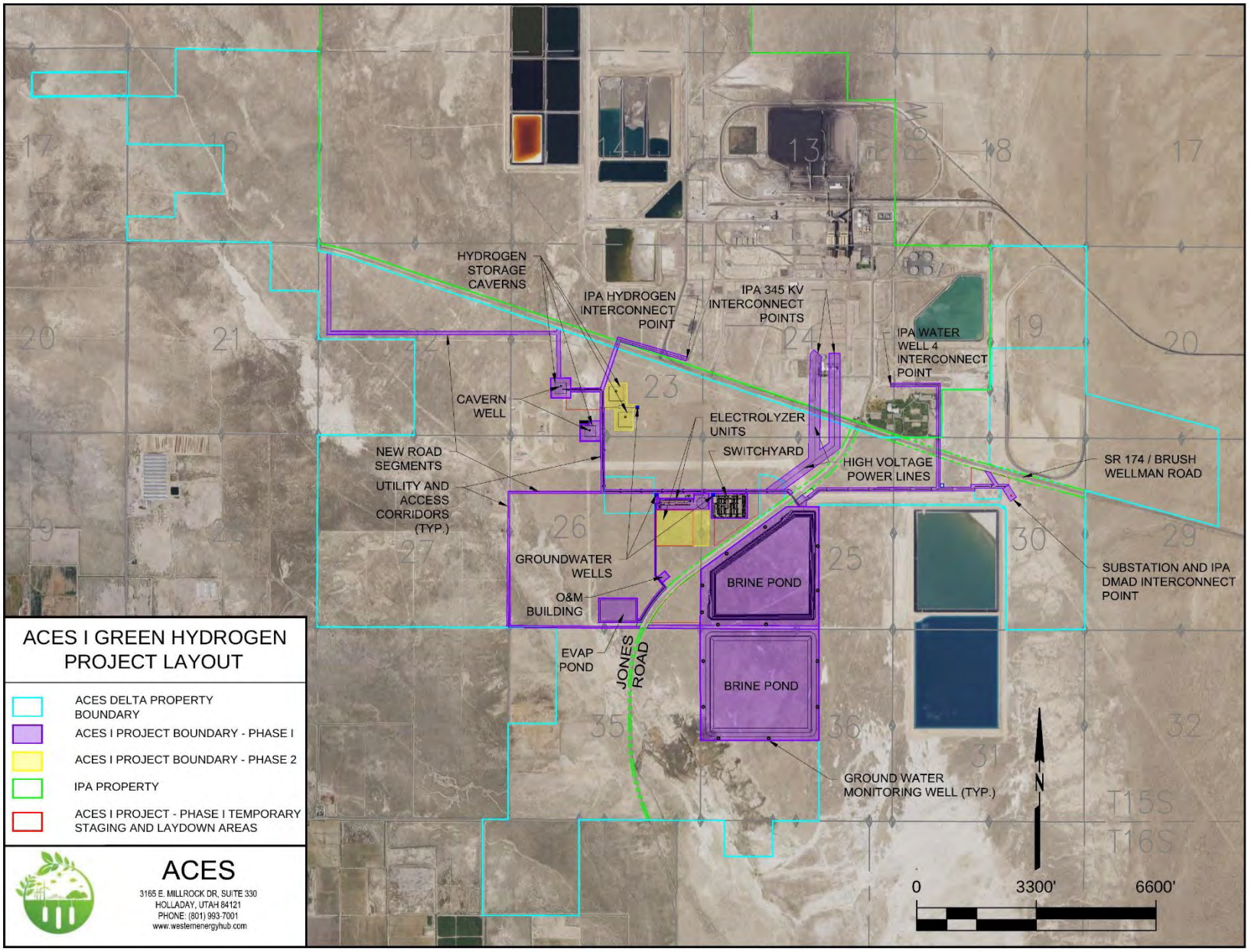
The Project is a renewable energy system that uses alkaline electrolyzers to generate and store hydrogen. The hydrogen will be produced from water using electricity from renewable sources (wind and solar) of electric generation at the adjacent IPP. The IPP provides power to municipalities in California, Utah, Wyoming, Colorado, and Arizona; therefore, the use of hydrogen as a fuel facilitates the decarbonization of the Western U.S. power grid. The Project is on lands leased from the Utah School and Institutional Trust Lands Administration (SITLA) just north of Delta near the intersection of Brush Wellman Road/State Route (SR-) 174 and Jones Road in Millard County, Utah (**Figure 1**).

**Figure 2** provides a map of the Project site plan. As shown, the major components consist of a 550-MW hydrogen generation facility, a hydrogen storage cavern field with four solution mined storage caverns, and ancillary support facilities located within the Project boundary. **Figure 2** also shows the ancillary support facilities, which are primarily located within centralized use areas of the Project site. The ancillary support facilities are associated with high voltage transmission lines, hydrogen generation, storage, and transportation via hydrogen pipelines, and brine storage operations. The facilities that extend onto IPP lands (e.g., high-voltage power lines, water supply pipelines, and hydrogen pipelines) will be owned and operated by IPP; therefore, these facilities and their associated impacts are not evaluated in this EA as part of the Project. **Exhibit 1** provides a high-level diagram of the hydrogen generation, storage, and distribution process. An overview of the Project components is presented below, and Sections 2.1 and 2.2 provide detailed descriptions of the construction and operations.

**Exhibit 1: Hydrogen Generation, Storage, and Distribution Process**



## Figure 2. Project Site Plan



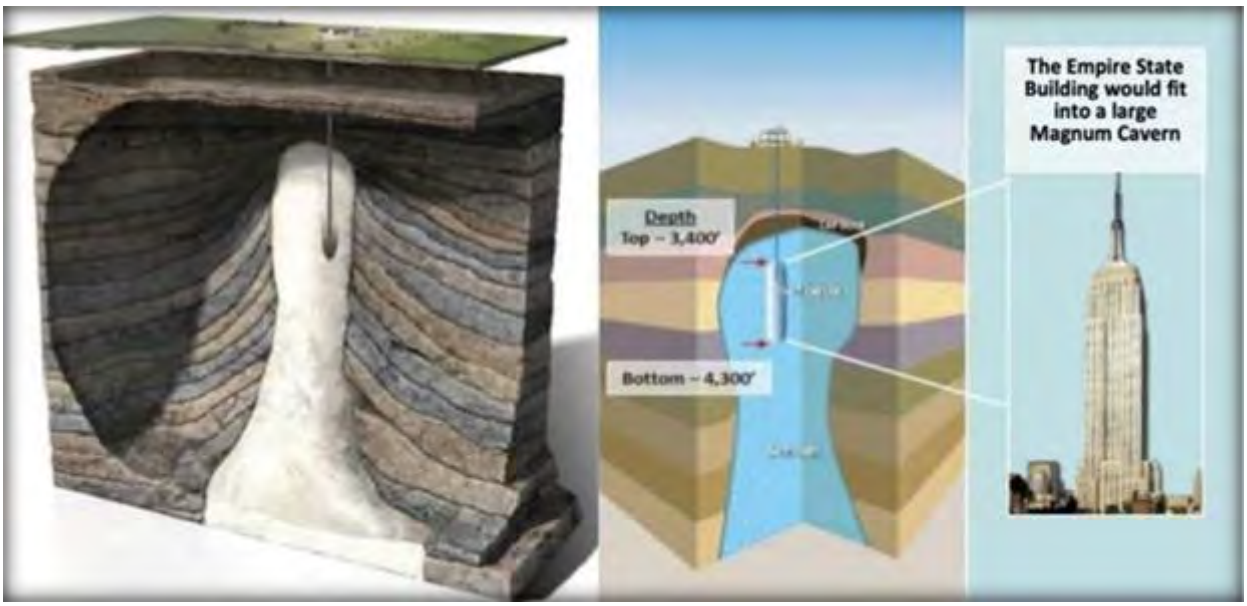
## 2.1 Hydrogen Generation Facility

The hydrogen generation facility will produce and compress hydrogen for delivery and storage in the storage caverns. The process to produce the hydrogen is based on the use of renewable energy and standard electrolysis technology that converts water electrolytically into hydrogen and oxygen. The Project will use alkaline electrolysis technology to produce hydrogen due to the maturity of the alkaline technology and its extensive operating record in industrial applications. Specific to the Project, the hydrogen generation facility will consist of banks or trains of industrial-scale alkaline electrolyzers in the approximate center of the Project area, just northwest of Jones Road. The hydrogen generation electrolyzers will be standard, above-ground mechanical units housed in ventilated shelters with low-profile cooling towers and other associated facilities. The hydrogen production capability of the full 550-MW facility equals approximately 250 metric tonnes per day of hydrogen fuel. This fuel will either be stored in the caverns for future use or supplied directly to the IPP via pipeline for immediate use generating electricity.

## 2.2 Hydrogen Storage Caverns

Four purpose-built solution mined storage caverns in a subsurface salt dome will be used to store the hydrogen for use as a fuel source at the adjacent IPP. The four storage caverns will be constructed within a storage cavern field approximately 0.75 mile northwest of the electrolyzers (see **Figure 2**). In accordance with the geo-mechanical design, the dimensions of each cavern are anticipated to be approximately 220 feet in diameter and approximately 1,200 feet in height. The tops of the caverns will range in depth between 3,500 and 4,100 feet below the ground surface (bgs), and the bases of the caverns will range in depth from 4,700 to 5,300 feet bgs. Each cavern will be able to store approximately 5,000 metric tonnes of hydrogen, equivalent to approximately 150,000 MWh of electric generation. The total stored volume of hydrogen in all four caverns will therefore be equal to a 600,000-MWh reserve capable of supplying electricity to approximately 667,000 homes for one month. **Exhibit 2** provides a stylized illustration of the location and scale of the caverns in the salt dome beneath the Project site.

**Exhibit 2: Illustration of Location and Scale of Below Ground Storage Caverns**




Two evaporation ponds will also be constructed to support the solution mining of the storage caverns. The evaporation ponds will be approximately 168 acres and 201 acres in size and are designed to contain approximately 5,000 to 7,000 acre-feet of brine solution. Both ponds will be double lined with a

high-density polyethylene (HDPE) geomembrane liner and will have a leak detection and groundwater monitoring system to protect groundwater resources.

## 2.3 Ancillary Support Facilities

Ancillary support facilities associated with the hydrogen generation facility and storage cavern field include an operations control and maintenance building; an electrical distribution and high-voltage transmission system with a substation and switchyard facilities; water and brine delivery systems with pumps, filtration, and pipelines; standard water treatment facilities to provide demineralized water for the electrolysis modules; demineralized water storage tanks; raw water tanks for process water; fire water storage tanks; cooling towers to support rejection of heat generated during the process; plant instrumentation; hydrogen gas delivery system with filtration and dehydration units and quality and flow measurement facilities; fences; and both new and existing access roads used by Sawtooth. It is anticipated that only minimal road improvements to existing roads within the larger property will be required to support the Project, and that only two new access road segments will need to be constructed. **Figure 2** depicts the network of 50- and 100-foot-wide utility and access corridors that will contain all Project-related electrical, water, brine, and hydrogen distribution systems and access roads. As shown in **Figure 2**, portions of the hydrogen and water distribution systems will extend from the Project boundary to interconnection points on IPP lands. In addition, two new 345-kilovolt (kV) high-voltage powerline tie-ins will be constructed within two 300-foot-wide utility corridors that extend from the Project to tie-in locations on IPP lands. IPP will own the portion of the high-voltage powerlines and the hydrogen and water distribution systems that are on IPP land; therefore, the portion of these facilities and their associated impacts on IPP land are not evaluated in this EA as part of the Project.

The Project will affect approximately 746.5 acres of land. **Table 1** below summarizes the temporary and permanent Project disturbance areas. The 96-acre area for the Phase 1 Hydrogen Generation Facility (220 MW) includes areas for ancillary equipment that will support Phase 1 and Phase 2. The 33-acre area for the Phase 2 Hydrogen Generation Facility (330 MW) includes additional hydrogen generators (electrolyzers). The 18-acre area for the Phase 2 storage caverns includes areas for associated pipeline corridors and ancillary equipment.

**Table 1: Summary of Project Disturbance Area**

| Project Component | Approximate Acreage |
|---|---|
| **Phase 1** | |
| Hydrogen Generation Facility (220 MW) | 96 |
| Storage caverns (2) | 4 |
| Brine Evaporation Pond 4 | 168 |
| Brine Evaporation Pond 6 | 201 |
| Operations/Welcome Center building | 1 |
| Wastewater pond | 16 |
| Groundwater monitoring wells (up to 10) | 0.3 |
| Utility corridor (100 feet wide) | 46 |
| Access roads | 45 |
| High-voltage electrical corridors (300 feet wide on Project lands; do not include additional 46.5 acres of corridor on IPP) | 36.5 |
| Staging and laydown areas | 81 |
| **Phase 2** | |
| Storage caverns (2) | 18 |
| Hydrogen Generation Facility (330 MW) | 33 |
| Groundwater supply wells (3) | 0.7 |
| **Total** | **746.5** |

## 2.4 Project Construction

The Project is located on a relatively flat area of a basin floor at an elevation of approximately 4,600 feet above sea level, in an area known as the Sevier Desert. As described previously, the Project is situated with a larger property designated for industrial development and easily accessible via an existing road network and multiple access points. The larger property containing the Project is currently fenced and access is restricted. All Project components, facilities, utilities, access roads, parking areas, laydown areas, and security fencing described in **Table 1** will be constructed entirely within the Project area. Additional security fencing will be added during construction of the Project at specific work areas when necessary.

To reduce the risk of congestion and road access for equipment deliveries, each of the main Project components will have dedicated access points off the main roads and temporary staging and laydown areas to support the construction. Only minimal road improvements to existing roads within the larger property are anticipated to be required to support the necessary equipment, tools, and machinery delivery to the construction zones. The two new access road segments will be constructed in association with the other Project facilities.

The Project will be constructed by an internationally recognized team that includes both an Engineering, Procurement, and Construction (EPC) contractor and an Engineering, Procurement, Construction, and Management (EPCM) contractor that have been selected for their specific expertise in the construction and operations start-up of similar Projects. The EPC/EPCM team will be organized in two teams to provide dedicated oversight of: 1) the construction and installation of the hydrogen generation facility to include the ancillary support facilities and brine evaporation ponds, and 2) specialized management of the drilling and solution mining of the storage caverns and construction of the associated water and brine delivery systems. To ensure that the Project is constructed in accordance with regulatory requirements, permit conditions, and engineering design and safety codes and standards, the EPC/EPCM will establish a Project-specific Quality Management Plan (QMP). The Applicant will also engage an Owner's Engineer and Quality Assurance/Quality Control (QA/QC) contractor to assist the Applicant's internal construction management team in the verification of all contractor work during construction and operations start-up.

During construction, the EPC/EPCM QMP and QA/QC contractor will be responsible for verifying the correct installation of all Project facilities, components, and equipment per the final design; industry best management practices (BMPs); applicable local, state, and federal regulations codes and standards; and Project permits (see Appendix A). This responsibility includes confirmation that the construction of all hydrogen generation and storage foundations, footings, buildings, and equipment shelters meet the conditions of the Millard County Building Permits issued to the Project and meet applicable national safety regulations, codes, and standards. This responsibility also includes ensuring the construction of the storage caverns, brine evaporation ponds, and wastewater ponds meet the requirements of the Utah Department of Environmental Quality (UDEQ), Division of Water Quality (DWQ) Groundwater Discharge Permit and Department of Natural Resources (DNR) Division of Water Rights (DWRi) Dam Impoundment Permit, and the water production wells meet the requirements of the DWRi and Division of Drinking Water (see Appendix A). As part of this responsibility, the EPC/EPCM QMP and QA/QC contractor will verify the initial mechanical integrity testing of the generation, storage, and ancillary facilities and the safety and groundwater protection design features to provide a strong baseline for the subsequent operations monitoring and testing that will be implemented for the life of the facility.

Due to the Project being in an active industrial area with ongoing operations, after construction, any temporary disturbance areas such as the staging and laydown areas for the hydrogen storage cavern and brine ponds and the utility and access corridors will be evaluated to determine which areas will either be reclaimed or left un-reclaimed to facilitate future facility construction. Reclamation of those areas that are selected will follow the reclamation and weed management procedures outlined in Appendix C, Environmental Compliance Measures. These procedures are based on standard reseeding methods, including employing soil decompaction practices, applying the approved seed mix for the site, and monitoring for and removing noxious weeds or invasive plants, as needed. Areas that are selected to be left un-reclaimed will be limited to only those areas where continued facility construction is planned in the near-term. In these instances, the location will be maintained to minimize potential fugitive dust from

those areas either by installing gravel or continuing fugitive dust management procedures outlined in Appendix C.

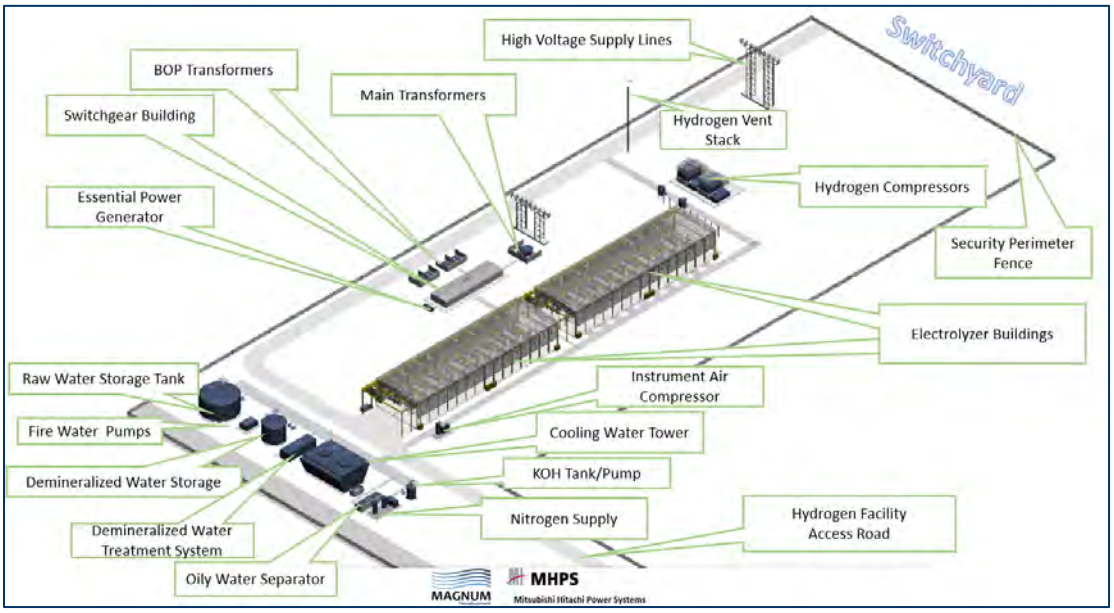
### 2.4.1 Hydrogen Generation Facility

As designed, the hydrogen generation facility will be installed within an approximately 96-acre area (Phase 1) and 33-acre area (Phase 2) that contain the following equipment and components:

- Electrolyzer trains and buildings
- Two hydrogen-electric driven compressors
- Raw and demineralized water storage tanks and treatment system
- Cooling water tower and electric circulating water pumps
- Electrolyte solution storage tank and raw water pump and fire water storage tanks
- Other equipment, such as an instrument air compressor, oil-water separator, essential backup power system, nitrogen supply, and a hydrogen vent stack
- A diesel-powered fire-suppression water pump and two emergency backup generators
- A wastewater pond

**Exhibit 3** provides the general layout of the hydrogen generation facility with equipment and components labeled. As described previously, the construction of the hydrogen generation facility will be completed in two phases between 2022 and 2026. The construction of the associated ancillary support facilities to support the installation and integration of the electrolyzer trains with the other Project components will also be completed during this same timeframe. The associated ancillary support facilities include gravel pads, cement foundations, electric power and water systems, a wastewater pond to contain discharged non-toxic cooling tower water, and the communications and hydrogen process management controls and fire safety systems. Any needed modifications to existing access roads and construction of two new access road segments will also be completed at this time. Due to this portion of the Project area being open and relatively flat with minimal topsoil, most construction activities will require limited grading and installation of drainage elements. Prior to the start of any construction, however, all required Stormwater Pollution Prevention Plan (SWPPP) measures will be installed, as well as wash and track-out stations to keep Project access intersections with existing roads clear of debris.

**Exhibit 3: Preliminary Hydrogen Generation Facility Layout**



The construction of the hydrogen generation facility will entail the installation of prefabricated electrolyzers and ancillary equipment and components on cement foundations or in some cases gravel pads. The electrolyzers will be modular in design to be able to scale-up in trains. The capacity of the electrolyzer trains installed during Phase 1 will be 220 MW. The capacity will be then expanded after Phase 1 is operational by an additional 330 MW of capacity in Phase 2. The electrolyzers and ancillary equipment and components will be shipped to the site either partially or fully assembled. In most cases, the cement foundations and pads will be constructed in advance of the equipment delivery to allow for a seamless installation process. It is anticipated that Phase 2 will be constructed commencing in 2025 and will be completed by 2026; however, the timing of Phase 2 construction will be ultimately dictated by market demand.

The final stage of facility construction will involve the erection and installation of the electrolyzer building and trains, final electrical cable pulls and wiring to the electrolyzers and other equipment, instrumentation installation, construction of the waste-water pond, and any painting and insulation of the building and components. The individual electrolyzer trains will be commissioned and tuned in advance of storage cavern construction being complete, and a full system/facility commissioning will be conducted for a month and a half after the cavern is debrined and ready to accept hydrogen gas, as described in Section 2.4.2.

In addition, to address the specific design, construction, and operation requirements associated with the generation and handling of hydrogen gas, a Safety in Design (SID) analysis and preliminary Process Hazard Analysis (PHA) were completed for the Project as part of the Front-End Engineering Design (FEED). The analyses were completed to determine the applicable regulatory requirements for preventative design features and measures and active and passive fire protection systems to incorporate into the facility design. A final PHA will also be completed as part of the final facility design. The purpose of the SID and PHA processes is to achieve a final facility design with the highest level of safety to prevent fire escalation, avoid risk to life, and minimize property damage. Examples of the design features that were incorporated include equipment and material selection appropriate for the hydrogen gas generation and handling process, minimum distances between certain hydrogen generation and handling equipment, the installation of a facility-wide leak detection and emergency shutdown system, and emergency and fire response and suppression measures.

### *2.4.2 Hydrogen Storage Caverns*

Four hydrogen storage caverns will be constructed between 2022 and 2026. The storage caverns will be constructed in a salt dome located approximately 3,000 feet bgs. The caverns will be constructed using a conventional solution mining process. This process involves circulation of high-pressure water through a storage cavern well that has been installed into the salt dome at a specific geologic location and depth. By circulating the water, the salt is dissolved, creating a predictably shaped void in the salt that can be used to store hydrogen. The solution mining process results in a non-toxic brine solution waste stream that is circulated from the well and delivered via a brine delivery system to two brine evaporation ponds (Pond 4 and Pond 6) for storage and evaporation.

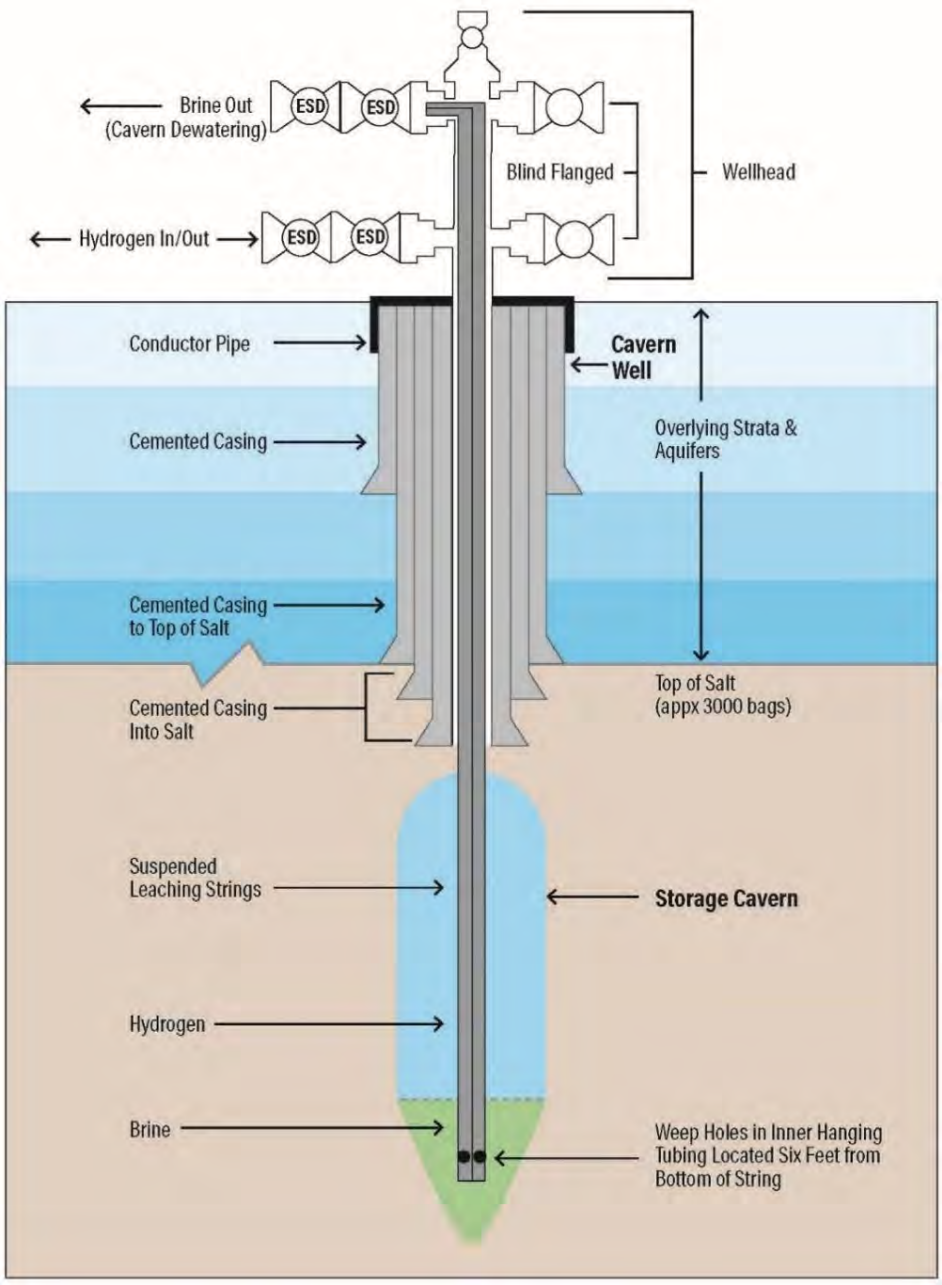
**Figure 2** depicts the locations of the storage caverns, the two brine evaporations ponds, and the associated water and brine delivery systems between the two Project components. Similar to the location of the hydrogen generation facility, the storage cavern field and the utility corridors for water and brine systems are located in portions of the Project area that are relatively flat with minimal topsoil that require limited grading and installation of drainage elements. The associated brine evaporation ponds, however, will require substantial earthwork due to their size (168 and 201 acres, respectively). However, the engineering design of the ponds will use a cut and fill mass balance model that will limit the surface disturbance from construction to within the designated pond footprints. The pond designs will also include drainage and water diversion elements to facilitate the natural flow and dissipation of any stormwater within the Project area.

Construction of the storage caverns will be completed in accordance with the DWQ Class III UIC Permit requirements. The DWQ has already issued the Project the required Class III UIC Permit, which includes an approved design and plan for cavern well spacing, wellhead, casing, drilling, cementing, and solution mining. The DWQ is also in the process of issuing a Class V UIC Permit for the operations and

maintenance of the storage caverns. Copies of the permits and associated DWQ Statement of Basis are published on the agency website at https://deq.utah.gov/water-quality/current-permits-utah-ground-water-quality-protection-program#cuicp.

The drilling and installation of the cavern wells will be completed according to the procedures outlined in the Cavern Construction and Development Plan, and the caverns will be solution mined in accordance with the procedures outlined in the Monitoring, Recording, and Reporting Plan. Both plans have been developed with and approved by the DWQ and are enforceable under the Class III UIC Permit. In addition, the permit requires a subsidence monitoring system be installed and a monitoring program implemented at the start of solution mining and continue through operations. The approved Subsidence Monitoring Plan will be attached to the Class V permit when issued. **Exhibit 4** provides a generalized schematic of the storage cavern design, showing the Emergency Shut Down (ESD) locations on the wellhead and cavern well configuration cemented through the overlying aquifers into the salt dome.

## Exhibit 4: General Schematic of the Storage Cavern




The construction of each cavern will take approximately six months to drill and install the storage cavern well, and up to 20 months to complete solution mining to a size that is approximately 220 feet in diameter and 1,200 feet in height and can store approximately 5,500 metric tonnes of hydrogen. The annual volume of water needed for solution mining between 2022 and 2026 will range from approximately 1,398 to 7,446 acre-feet of surface water. Cavern depths will depend on the individual location of each cavern within the salt dome. The tops of caverns will likely range in depth between 3,500 and 4,100 feet bgs, and the bases of caverns will range in depth from 4,700 to 5,300 feet bgs.

Below is a summary of the storage cavern well drilling and solution mining process:

- Each cavern well will require an approximately 2-acre construction and operations area independent of the associated utility and gravel access road.

- As shown in **Exhibit 4**, the design includes a complex casing system that will be used to construct the cavern wells. Four concentric steel casings will be drilled and cemented into a predefined depth within the salt dome to protect USDWs.
- Cavern wells will be initially drilled to a maximum depth in the salt dome. The drill stem will then be withdrawn to leave an open hole between the final cemented shoe and the bottom of the hole.
- A nitrogen blanket will be injected from the surface to a level about 200 feet below the final cemented shoe. This will keep the solution mining activity below the shoe to protect the integrity of that shoe and to control the shape and rate of the development of the cavern.
- During solution mining, fresh water will be injected at a rate of approximately 2,500 gallons per minute (gpm), circulated in the developing cavern, and the resulting brine solution will be withdrawn and directed into the brine evaporation pond for storage and evaporation.
- Upon completion of solution mining, a Mechanical Integrity Test (MIT) will be completed in accordance with state and federal regulations to ensure the integrity of the cavern, and the cavern will be placed into service.

Two brine storage and evaporation ponds (Pond 4 and Pond 6) will be constructed in an approximately 369-acre area to support the solution mining of the storage caverns. Construction of Pond 4 will be completed in 2022, and construction of Pond 6 will be completed in 2023. Both ponds will have double liners, a leak detection and recovery system, and shallow groundwater monitoring wells. At this time, the DWQ has issued the required Groundwater Discharge Permit approving the design and authorizing the construction and operation of Pond 4. The DWRi has also issued a corresponding Dam Impoundment Construction and Operations Order for Pond 4, approving the design and authorizing the construction and operation. The joint jurisdiction over the ponds is relative to each agency's oversight responsibilities. The DWQ has jurisdictional responsibility over the protection of groundwater relative to potential leaks into the groundwater system and USDWs from the ponds. The DWRi has jurisdictional responsibility for the safety and integrity of the pond as an impoundment. Both permits will be amended to include an approval for the design, construction, and operation of Pond 6 once the final design is completed. A copy of the DWQ Groundwater Discharge Permits and associated Statement of Basis are published on the agency website at https://deq.utah.gov/water-quality/current-permits-utah-ground-water-quality-protection-program. A copy of the DWRi Dam Impoundment Construction and Authorization Order can be obtained by contacting the agency, and general details can be found on the agency website at https://www.waterrights.utah.gov/cgi-bin/damview.exe?Startup.

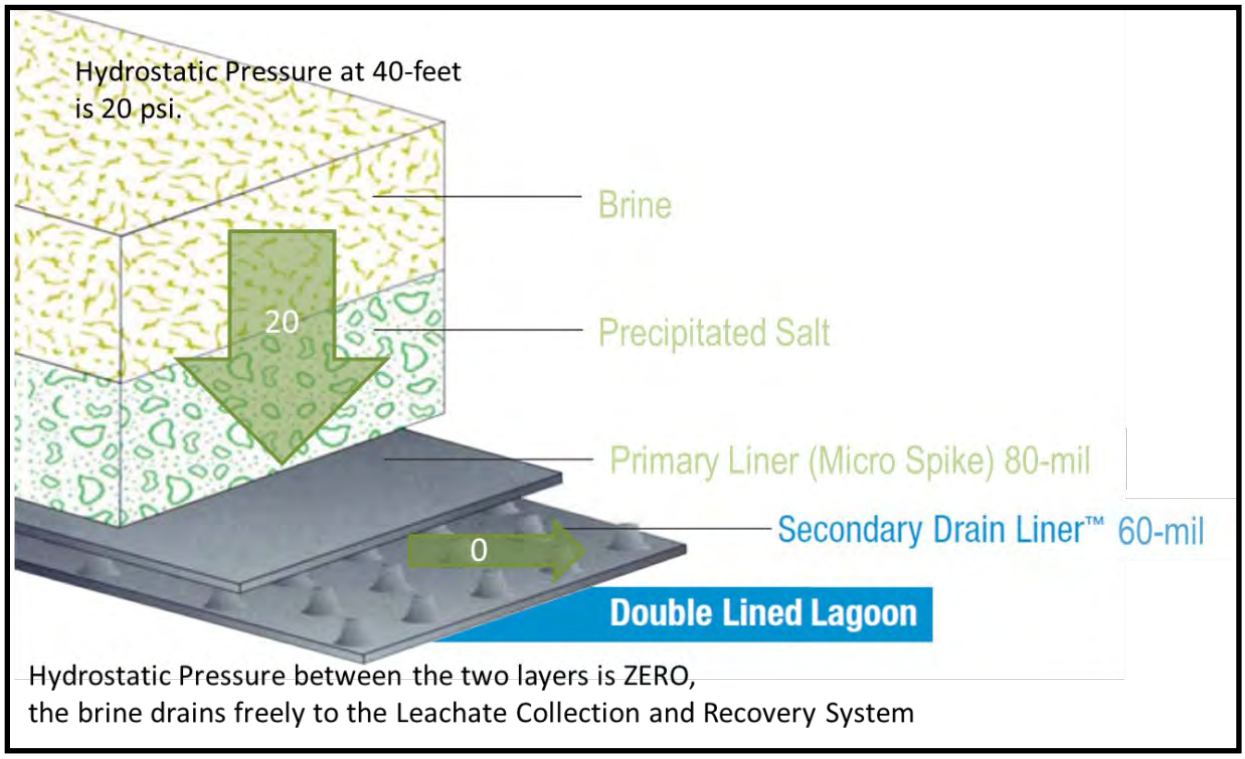
The time required to construct each pond will be approximately 6 months, and the optimum construction timing is between March and October to avoid schedule delays due to inclement weather. **Figure 2** depicts the location of the ponds. As shown in **Figure 2** and described in **Table 1**, the total footprint of Pond 4 (including containment berms) will be approximately 168 acres, and Pond 6 will be approximately 201 acres. The design volume of Pond 4 is based on the ability to store 5,500 acre-feet of brine resulting from the construction of the first cavern and an additional volume created by a 100-year storm event in a 24-hour period. To accommodate this volume, the pond has a design depth of 58 feet with berm heights that are between 40 and 68 feet. Pond 6 will be designed to have a similar capacity and dimensions. The cumulative size of the ponds is based on the necessary storage volume of brine created from construction of the first two storage caverns. To avoid the risk of overtopping, the ponds will operate with a minimum of 3 feet of freeboard. Details of the pond construction process are provided below.

Construction of the brine evaporation ponds will require the use of light and heavy equipment to clear vegetation, grade surfaces, excavate and compact the pond floor, install the pond liners, and construct the pond walls/containment berms. The pond walls/containment berms will have a 24-degree interior side slope and a 26.6-degree exterior side slope with soil from entirely within the pond footprint. Each pond will be constructed with four sections that grade toward the center in order to allow potential leakage to be collected by the leak detection and recovery system. The clay liner underlying the bottom HDPE liner will be composed of low permeability soils or treated bentonite. Once constructed, berms will be seeded to encourage vegetative cover.

To ensure groundwater protection, the brine evaporation ponds will be completed with a compacted subgrade and lined with a synthetic double liner system and under-liner drainage system. In addition, an

array of shallow groundwater monitoring wells will be installed around the perimeter of the pond. The primary liner of the system will consist of an 80-mil HDPE geomembrane liner. The secondary liner will consist of a 60-mil HDPE geomembrane drain liner with 130-mil high raised studs supporting the primary liner. The studs will create an unpressurized drainage space between the liners. **Exhibit 5** provides a depiction of a typical double liner system for evaporation ponds.

**Exhibit 5: Typical Double Liner System**




The drainage gap between the liners allows any fluid leakage to flow freely to a Leak Collection and Recovery System (LCRS) sump in the corner of each pond. A Process Component Monitoring System (PCMS) will also be installed below the secondary liner. The PCMS consists of a series of shallow trenches containing 4-inch-diameter perforated and corrugated chlorinated polyethylene (CPE) piping below the secondary liner and covering the entire bottom of the pond. The CPE piping will allow any liquids permeating the secondary liner to flow into a second sump adjacent to the LCRS sump in the corner of the pond. Any fluid that collects in either sump will be removed and pumped back into the pond, creating a closed system. An array of shallow groundwater aquifer monitoring wells will also be installed upgradient and downgradient of the evaporation ponds at a depth between 30 and 60 feet bgs.

### *2.4.3 Ancillary Support Facilities*

Construction of most ancillary support facilities will require the use of light and heavy equipment to clear vegetation, grade surfaces, and excavate and compact soils for engineered cement foundation and pad sites. As described in the sections above, the construction of these facilities will be timed during Phase 1 and Phase 2 to support the construction and operational use of the hydrogen generation facility and the hydrogen storage caverns, respectively. Facilities that will be installed include an operations and maintenance building and prefabricated storage tanks, pump houses, electrical buildings, and filter and dehydration buildings that will be mounted on cement and gravel pads. It is anticipated the Project will primarily use existing gravel roads, and only two new access road segments will be constructed to provide access to the storage cavern field from the north via Brush Wellman Road (see **Figure 2**). The new access road will be constructed with a 35-foot-wide engineered and graveled travel way and will be crowned and ditched.

An operations controls and maintenance building will be constructed with a parking lot and septic system. **Figure 2** depicts the location of the building to the west of Jones Road opposite Pond 4. The building will contain a control room to monitor and manage the facility-wide operations using a Supervisory Control and Data Acquisition (SCADA) system. The SCADA system will monitor the production and control of hydrogen gas flows, low and high voltage power distribution, water and brine delivery systems, cavern solution mining activities, and pond operations. The facility-wide Emergency Shut-Down System will also be controlled by the SCADA system.

Project pipelines for water, brine, and hydrogen will require the excavation of trenches to allow for a minimum 3 feet of cover or a depth established by safety regulations, codes, and standards. The water and brine delivery systems constructed during Phase 1 will be completed primarily within the 100-foot utility and access corridor (see **Figure 2**). These two systems will include up to three water wells, pumping equipment, and HDPE delivery pipelines that are 22 and 18 inches in diameter and extend from the various Project components, including fire suppression and emergency management systems, to tie-ins with the existing IPP water system. Specifically, the Project will tie into a 48-inch cement waterline coming from the IPP Delta, Melville, Abraham, and Deseret (DMAD) surface water reservoir along the eastern Project boundary near the electrical substation and into IPP groundwater well #4, which is north of SR-174/Brush Wellman Road. As described in Section 3.0, Environmental Consequences, the Applicant owns sufficient approved groundwater rights and surface water access rights to supply the Project; however, IPP has agreed to supply the Project with the necessary groundwater and surface water resources for both construction and operation.

A new 46-kV electrical distribution line and 12.4-kV secondary substation will be installed to provide on-site power during construction and operations. Both the new distribution line tie-in and substation will be located at the eastern boundary of the Project just south of Brush Wellman Road/SR-174 (see **Figure 2**). The tie-in will be with an existing Rocky Mountain Power 46-kV line that runs past the east side of the Project. The distribution line will be located within the central utility corridor and hung on aboveground poles. Up to two new 345-kV high-voltage transmission lines will also be constructed for the delivery of renewable energy to the hydrogen generation facility. While the final transmission line designs have not been completed, it is anticipated that IPA will construct the lines to tie directly into bays at the IPP switchyard currently being expanded. The locations for the transmission lines are shown on **Figure 2**.

## 2.5 Project Operation

The Project will be operated as an integrated facility in accordance with applicable regulations, codes, standards, and permit requirements. During operations, the Project will be staffed 24 hours a day, 7 days a week. Approximately 18 to 20 full-time employees will be required for facility operations. An initial team of 8 to 10 full-time employees will be hired to manage the storage cavern solution mining activities while the final construction activities are being completed for the hydrogen generation facility and balance of plant. A central SCADA system will be installed to monitor and manage the generation, storage, and delivery of hydrogen gas during operations. The SCADA system will also monitor and manage the low and high voltage power distribution, water and brine delivery systems, cavern solution mining activities, pond operations, and facility-wide Emergency Shut-Down (ESD) System. Routine visual inspections of the hydrogen generation facility, storage caverns, brine pond, and other ancillary facilities will also be conducted by employees as part of standardized operations and maintenance (O&M) procedures.

During operations, all ancillary support facilities will be operated and maintained in accordance with the individual equipment specifications and applicable regulations, codes, standards, and permit requirements. Normal operations and routine monitoring, testing, and maintenance will be completed per the O&M and Process Safety Management (PSM) procedures as described in the sections above.

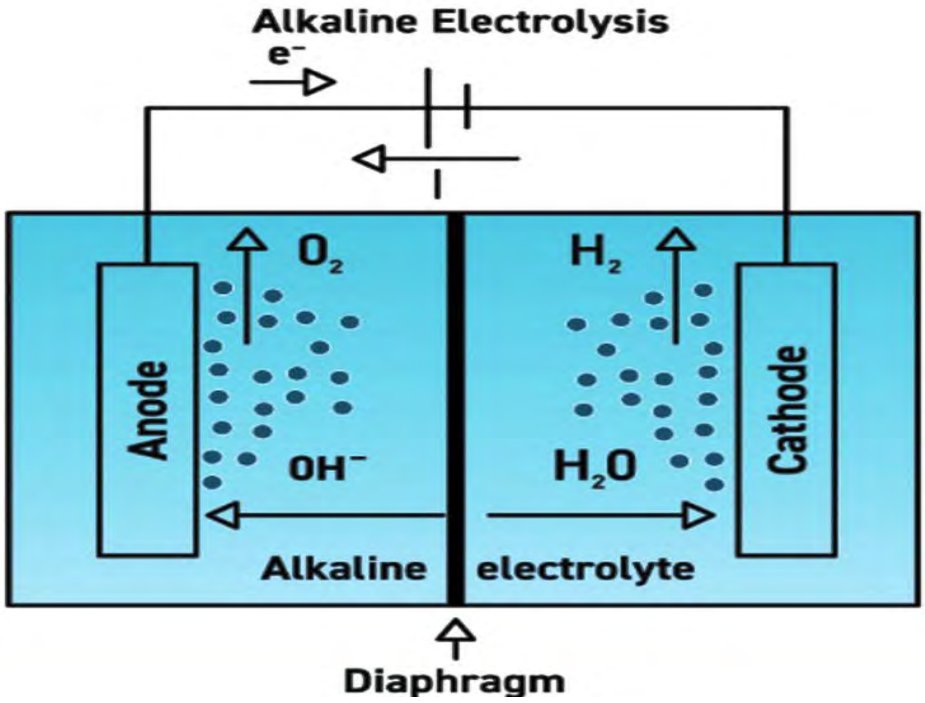
### *2.5.1 Hydrogen Generation Facility*

The hydrogen generation facility will be operated with power generated using renewable electricity supplied by IPP. The electrolyzer capacity during Phase 1 operations will be 220 MW, and an additional 330 MW of electrolyzer capacity will be added as part of Phase 2 construction. The electrolyzers will generate hydrogen and oxygen using an alkaline electrolysis process, and the produced gases (hydrogen

and oxygen) will be piped independently to a corresponding separator unit, while circulating pumps will circulate the electrolyte in the separator unit, aiding in the release of entrapped hydrogen and oxygen in the electrolyte solution. Hydrogen produced from the electrolyzers will be routed to the hydrogen compressor system, while oxygen will be vented to the atmosphere. Heat exchangers will maintain the electrolyte solution at an optimal temperature to support the electrolysis process.

Electrolysis is a process where an electric current is passed the through cathodes and anodes that are immersed in a diluted electrolyte solution (e.g., diluted potassium hydroxide). Each electrolyzer cell stack consists of several cells, and each cell has a bi-polar plate in the center and two electrodes, called a cathode and an anode composed of nickel and iron, respectively. Oxygen and hydrogen gases are produced when a direct current flows through the cell stacks and hydrogen gas is generated at the cathode side and oxygen gas is generated at the anode side. During Phase 1, approximately 100 metric tonnes of hydrogen will be generated per day. Under Phase 2, this amount will increase by 150 metric tonnes of hydrogen per day for a total of 250 metric tonnes per day to supply 550 MW of electric generation capacity. **Exhibit 6** below provides a simple diagram of the alkaline electrolysis process.

**Exhibit 6: Alkaline Electrolysis Process Diagram**




The hydrogen compressors will compress the hydrogen and deliver it to either the IPP for immediate use or to the caverns for storage. During hydrogen withdrawal periods from the caverns, hydrogen will free flow from the caverns through filtration and dehydration vessels, then via a steel pipeline to the IPP, where it will be blended with natural gas and fed into a turbine to produce electricity.

Operation of the Phase 1 220-MW electrolyzer facility will require approximately 755 acre-feet of groundwater annual or approximately 468 gpm. The groundwater will be split into two main streams: 1) a stream to serve the Project's cooling water system; and 2) a stream to the demineralizer system, where the raw water will be purified and demineralized for use in the electrolyzer. While the final design of the Phase 2 electrolyzer equipment is not complete, it will be assumed for purposes of this EA that the groundwater requirement for the additional 330 MW of hydrogen generation capacity will be 1,057 acre-feet or approximately 655 gpm. The total groundwater requirement for both Phase 1 and Phase 2 operations will therefore be 1,812 acre-feet or approximately 1,123 gpm to support 550 MW of hydrogen generation capacity.

The process will require demineralized water that is produced through a combination reverse osmosis/ion exchange process that is commonly used in water treatment facilities. This process consists of passing pre-filtered water through a membrane with tiny pores to remove nearly all dissolved mineral ions, followed by passing the water through ion exchange beds or columns. In the ion exchange beds or columns, any remaining dissolved minerals and salts in the raw water are attracted to various resins contained in the ion exchange vessel and removed from the water. After demineralization, about 200 gpm of demineralized water will flow to the electrolyzer, while 100 gpm will be rejected from the demineralization system. This rejected water is non-toxic and will be piped and stored to a single-lined wastewater pond located south of the hydrogen generation facility for evaporation (see **Figure 2**).

### *2.5.2 Hydrogen Storage Caverns*

The hydrogen storage caverns will be operated and maintained in accordance with the approved Hydrogen Storage Cavern Field Operating, Monitoring, and Maintenance Plan (SCFOMMP) that will be enforceable under the DWQ Class V UIC permit when it is issued. A summary of the main cavern operations procedures is included below:

- The hydrogen that is routed from the electrolyzers to storage will pass through a flow meter at the wellhead, where incoming and outgoing volumes are recorded, and gas is injected and withdrawn from the cavern.
- As described previously, each cavern will be able to store approximately 5,000 metric tonnes of hydrogen or approximately 150,000 MWh of electric generation to provide up to a 600,000-MWh reserve of hydrogen fuel that can be used by IPP to meet peak demands.
- Cavern temperatures and pressures will be consistently measured and monitored at the wellhead and inside the cavern to verify volume and to maintain the allowable minimum and maximum operational pressures established by the geo-mechanical design criteria and required by the SCFOMMP.
- Special sensors will also be mounted next to the wellhead to detect fire and hydrogen gas.
- In the event of a loss of system or cavern pressure, equipment failure, or the detection of gas leakage or fire within the facility, the valves on the wellhead assembly are designed to respond by automatically closing, stopping all hydrogen gas flow.

In addition to the individual storage caverns being continuously monitored during operations, the storage caverns, cavern well, and wellhead will be periodically tested—both individually and as a system—for mechanical integrity. The geometry of each cavern will also be monitored to ensure that both the caverns and the relationship of the caverns to each other within the salt dome meet the geo-mechanical design criteria in the SCFOMMP. In the event a cavern does not pass mechanical integrity or other testing requirements, the SCFOMMP outlines the agency notification procedures and other measures, including closure and abandonment plans.

The brine evaporation ponds will also be operated in accordance with approved plans, and a summary of the operating, monitoring, testing, and reporting requirements are provided below:

- Pond berms will be visually inspected daily for integrity and signs of instability.
- Pond levels will be visually monitored on a daily basis during active periods of solution mining to ensure 3 feet of freeboard is maintained.
- The LCRS and PCMS sumps will be continuously monitored to record the leakage rate between and below the double liner system, and sump pump functionality will be checked daily.
- Upgradient and downgradient shallow groundwater monitoring well data will be collected, analyzed, and reported on a monthly and quarterly basis per the Groundwater Monitoring Plan.

# 3.0 ENVIRONMENTAL CONSEQUENCES

## 3.1 Introduction

In each of the following sections, a specific resource area is addressed with both qualitative and, where applicable, quantitative information to concisely describe the nature and characteristics of the resource that may be affected by the Project, as well as the potential impacts on that resource from the Project given Project design features. A conclusion regarding the significance of impacts is provided for each resource area.

## 3.2 Environmental Setting

The Project is located in the northern portion the Sevier Desert in central Utah (see **Figure 1**). The location is in the Central Basin and Range physiographic province, which covers much of the western U.S. This ecoregion is composed of northerly trending, fault-block mountain ranges dominated by woodland and mountain brush vegetation communities with arid, intervening basins dominated by shrub and grassland vegetation communities and bare ground (Woods et al. 2001[1]). The basin in which the Project site is located is bounded on the east by the Canyon and Gilson Mountain ranges; on the north by the Sheep Rock, Simpson and Keg Mountains; and on the west by the House Range, Drum and Little Drum Mountains. As described in the 2010 and 2015 FERC EAs, the southern portion of the basin is known as the Black Rock Desert.

## 3.3 Climate Change – Greenhouse Gas Emissions

### *3.3.1 General Setting*

The current science and study of the earth's climate now show with 95 percent certainty that human activity is the dominant cause of observed global warming since the mid-20$^{th}$ century (Intergovernmental Panel on Climate Change 2013[2]). Since the beginning of the industrial era circa 1750, human activities have increased the concentration of GHGs—primarily carbon dioxide ($CO_2$), nitrous oxide ($N_2O$), methane ($CH_4$), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ($SF_6$)—in the atmosphere. The rising global temperatures have been accompanied by changes in weather and climate, such as changes in rainfall, resulting in more floods, droughts, or intense rain; rising sea levels; Arctic sea ice decline; and more frequent and severe heat waves (Intergovernmental Panel on Climate Change 2013). It is now well established that rising atmospheric GHG emission concentrations are significantly affecting the earth's climate (CEQ 2016[3]).

### *3.3.2 Greenhouse Gas Emissions*

As presented in Section 2.0, Description of the Proposed Action, the Project would provide hydrogen to the IPP to replace natural gas for electricity generation. By replacing a portion of the natural gas used to run turbine generators, the Project would achieve net GHG emissions reductions as compared to just using conventional natural gas-fired electric turbine generators.

The IPP will operate turbine generators capable of running on a mix of natural-gas and hydrogen to produce a total of 840 MW of electricity, with planned operational fuel blend of 30 percent hydrogen/70

[1] Woods, A.J., Lammers, D.A., Bryce, S.A., Omernik, J.M., Denton, R.L., Domeier, M., and Comstock, J.A., (2001), Ecoregions of Utah (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,175,000)

[2] IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

[3] U.S. Council on Environmental Quality (CEQ). 2016. Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews. August 1. 33 pp.

natural gas (volume/volume) at commissioning (2025). The IPP anticipates ramping up the amount of hydrogen in the fuel gas blend above 30 percent. However, for the purposes of estimating the GHG emissions reductions of the Project, operation at 30 percent hydrogen/70 percent natural gas was used. In addition, the electrolyzers would use renewable power; therefore, the operation of the electrolyzers would have no GHG emission impact.

The GHG reduction for the Project is based on the difference in the emission profiles of the IPP turbines between 100 percent natural gas fuel to a 70 percent natural gas and 30 percent hydrogen fuel blend (70/30 fuel blend). For the purposes of this assessment, only $CO_2$ emissions from gas turbine operation are estimated, which represents the majority of the emissions. $CH_4$ and $N_2O$ emissions would also occur from operation of the gas turbines at 100 percent natural gas and 70 percent natural gas but would not notably alter the overall GHG emission profile.

The estimated reduction in GHG emissions takes into account the different heat content between a 100 percent natural gas (1,000 British Thermal Unit [BTU] per cubic foot) and a 70/30 fuel blend (795 BTU per cubic foot) and the additional amount of the 70/30 fuel blend that would be required to generate the same amount of electricity. Operating the gas turbines with 100 percent natural gas (emission factor of 0.0548 kg $CO_2$ per cubic foot natural gas) would result in approximately 1,578,161 metric tonnes of $CO_2$ emissions per year. Operating the gas turbines with a 70/30 fuel blend with the same natural gas emission factor would result in approximately 1,451,644 metric tonnes of $CO_2$ emissions per year, a reduction of approximately 126,517 metric tonnes (an 8 percent reduction) per year. Operation at 100 percent hydrogen (anticipated to commence by 2045) would result in a 100 percent reduction in GHG emissions, corresponding to a reduction of 1.58 million metric tonnes of $CO_2$ per year. In general, the potential benefits associated with reducing $CO_2$ emissions would support a reduction in GHG concentrations and the associated climate change impacts (e.g., increases in atmospheric temperature, changes in precipitation, increases in the frequency and intensity of extreme weather events, and rising sea levels).

## 3.4 Water Resources

### *3.4.1 General Setting*

The Project is located in the Sevier Desert River Basin and will utilize surface water from the basin for construction and groundwater from the basin for operations. The Sevier Desert River Basin is fed by several perennial streams that originate in the mountains surrounding the basin. As these streams flow into the basin, the water either percolates into the groundwater aquifer system that has formed within the unconsolidated basin fill or is impounded in reservoirs and diverted along the Sevier River, which is the main surface waterbody nearest to the Project. As described in Section 2.0, Description of the Proposed Action, IPA will provide water from surface water and groundwater sources for Project construction and operations. IPA has 45,000 acre-feet of surface water and groundwater rights for use annually and will deliver it to the Project via the existing IPP surface water and groundwater delivery system. The source of surface water will be from the DMAD reservoir located approximately 9 miles southeast of the Project site, which will be delivered to the IPP site and then will be delivered to the Project via an interconnection with an existing 48-inch cement pipeline. The source of groundwater will be from an existing IPP water well #4, and water will be delivered to the Project via an interconnection with an existing delivery pipeline. The Project also has 8,082 acre-feet in approved groundwater rights and use agreements in place to construct three new groundwater wells to provide a contingency water supply if necessary.

### *3.4.2 Surface Water and Groundwater Quantity*

Potential impacts on water quantity would include the temporary use of surface water to construct Project facilities and the long-term use of groundwater to support operations. During construction, surface water would also be used to support general facility and utility construction, such as site-wide dust mitigation and soil compaction for brine ponds, facility pads and foundations, pipelines, and access roads. Surface water would also be used to solution mine the storage caverns. It is currently anticipated that after solution mining is complete, Project operations would only require the use of groundwater; however,

depending upon the final design, some surface water could be used to supplement groundwater usage during operations.

During operations, groundwater will be used for the electrolysis process to generate hydrogen and to support general operations requirements such as drinking water, sanitation, and fire safety and suppression. The total annual surface water and groundwater requirements for the Project are summarized in **Table 2**. The total water requirements are based on calculations defined by the current Project design to construct and operate the first two storage caverns and 220 MW of hydrogen generation capacity and an estimate to construct and operate the second two storage caverns and an additional 330 MW of hydrogen generation capacity.

## Table 2: Annual Water Volume in Acre Feet Required for Project Construction and the Start of Operations for Phase 1 and Phase 2

| | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 |
|---|---|---|---|---|---|---|---|---|---|
| Hydrogen Storage Facilities Construction Phase 1 (surface water) | 1,398 | 7,446 | 6,048 | 0 | 0 | 0 | 0 | 0 | 0 |
| Hydrogen Storage Facilities Construction Phase 2 (surface water) | 0 | 0 | 0 | 6,825 | 6,825 | 0 | 0 | 0 | 0 |
| *Surface Water Subtotal* | *1,398* | *7,446* | *6,048* | *6,825* | *6,825* | *0* | *0* | *0* | *0* |
| Hydrogen Generation Facilities Phase 1 (groundwater) | 99 | 452 | 598 | 755 | 755 | 755 | 755 | 755 | 755 |
| Hydrogen Generation Facilities Phase 2 (groundwater) | 0 | 0 | 0 | 99 | 452 | 1,057 | 1,057 | 1,057 | 1,057 |
| *Groundwater Subtotal* | *99* | *452* | *598* | *854* | *1,207* | *1,812* | *1,812* | *1,812* | *1,812* |
| **Phase 1 and Phase 2 Total** | **1,497** | **7,898** | **6,646** | **7,679** | **8,032** | **1,812** | **1,812** | **1,812** | **1,812** |

As described in Section 2 and shown in **Table 2**, the largest volume of water used by the Project will be the temporary use of surface water to support solution mining of storage caverns. Between 2022 and 2026, the estimated average annual surface water requirement will range between approximately 1,398 acre-feet in year 2022 and approximately 7,446 acre-feet in year 2023, and decreasing to 6,084 to 6,825 acre-feet in years 2024, 2025, and 2026 (approximately 866 to 4,616 gpm). This volume of water is sufficient to allow for all four caverns to be solution mined at a rate of 2,500 gpm each for a period of 20 months each while other construction activities are being completed. Upon completion of Phase 1 and Phase 2 construction, the Project will no longer use surface water.

Between 2022 and 2026, groundwater would also be used for a demineralized water supply to support the installation of the hydrogen generation facilities, and then the ongoing electrolysis process and the cooling water supply to the electrolyzer units. **Table 2** shows that the estimated average groundwater requirements during this period will range between approximately 99 and 1,812 acre-feet (approximately 61 to 1,123 gpm). Groundwater uses include the installation, final testing, commissioning, and operations start-up of both the Phase 1 and Phase 2. The annual groundwater requirement for Phase 1 would be 755 acre-feet, and the annual groundwater requirement for Phase 2 would be 1,057 acre-feet (approximately 657 gpm). Therefore, if the market supports the construction of both phases, then the total annual groundwater requirement for the life of Project operations would be 1,812 acre-feet per year (1,123 gpm).

In the state of Utah, all surface water and groundwater uses are regulated by the Utah State Engineer and the DWRi, in accordance with state law. The Sevier River Basin is considered a “closed basin,” which means that no new water rights appropriations are approved by the State Engineer. The State Engineer has previously reviewed and approved both the IPA and ACES surface water and groundwater rights allocations through a public point of diversion application process. The primary criterion that the State

Engineer considers in evaluating change applications for either surface water or groundwater rights is the potential impairment of other water rights. Therefore, Project-related water use does not constitute a new or additional depletion of groundwater capacity of the Sevier Desert River Basin, nor does it present an impact on other surface water or groundwater rights users or the actual surface water and groundwater resources.

In addition, an independent evaluation of the Sevier Desert River Basin completed for the Project found that Project construction and operation would not result in an adverse impact on the Sevier Desert River Basin surface water or groundwater capacity (Loughlin Water Associates 2022[4]). The evaluation was based on a literature review of previous surface water and groundwater basin studies, DWRi water usage records, and a comparison of the studies and records relative to total water resources needed for Project construction and operations. Previous studies indicate the annual water recharge to the entire Sevier Desert area is estimated to be approximately 92,000 acre-feet per year, although not all of that recharge would be available for surface water diversion and groundwater well withdrawals.

Relative to surface water, between 1943 and 2021, DWRi records indicate the average discharge from the Sevier River at the gage near Lynndyl—which is just upstream of the DMAD reservoir—was 169,700 acre-feet per year. DWRi records also indicate that IPP diverted approximately 16,760 acre-feet per year (approximately 10,400 gpm) of surface water on average from 1988 to 2020 at the Sevier River Pump Station on the DMAD Reservoir. In comparison, IPP's diversion at this one point along the Sevier River represents approximately 10 percent of the total available volume, and the anticipated average peak of 7,446 acre-feet (approximately 4,616 gpm) of surface water use by the Project between 2022 and 2027 represents just .04 percent of the total available volume.

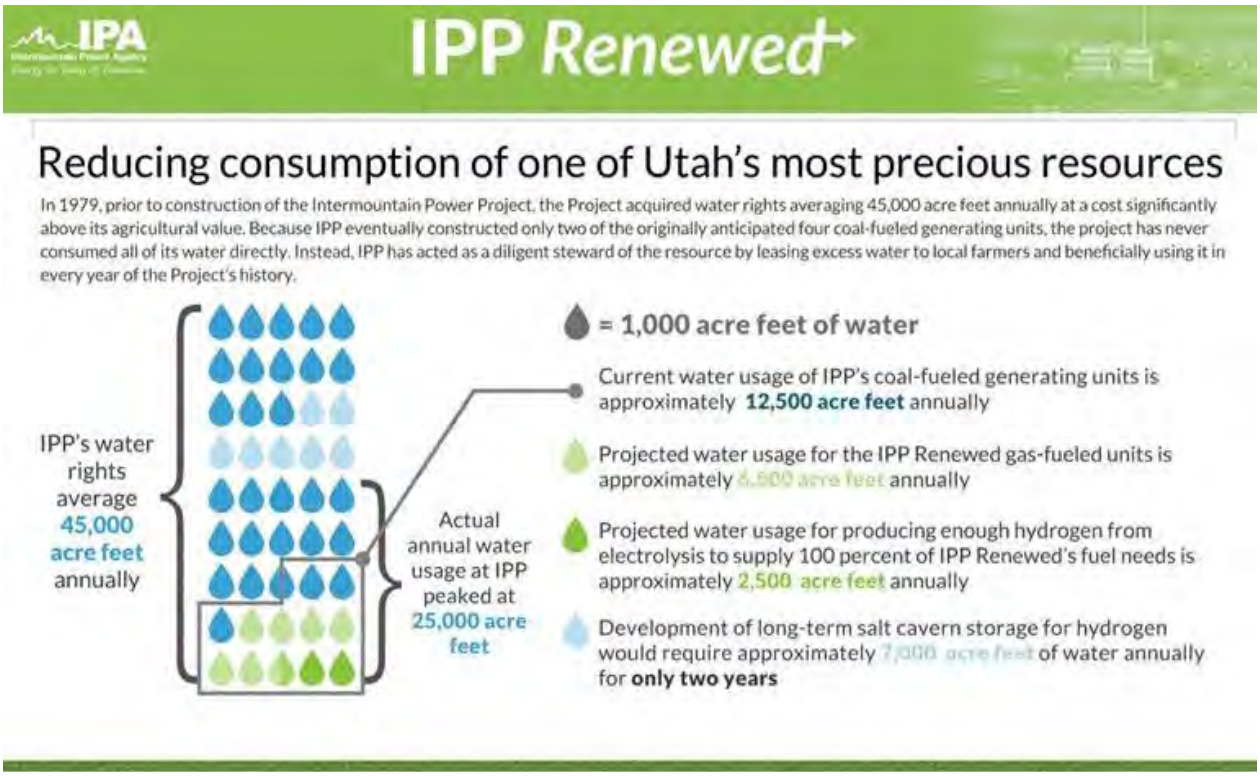
DWRi records also indicate that the combined annual groundwater withdrawal by wells in the basin from 2002 through 2017 varied between 20,000 and 57,000 acre-feet per year, with an average of approximately 39,000 acre-feet per year. In comparison, IPP continuously withdrew an average of 3,510 acre-feet per year (approximately 2,180 gpm) between 1988 and 2020, which represents approximately 9 percent of the average basin withdrawals. The anticipated total annual withdrawal of 1,812 acre-feet per year (approximately 936 gpm) for ongoing Project operations would be approximately 4.6 percent of the average basin withdrawals.

IPA has also published a high-level summary to illustrate the decrease in water use that would result from the change of fuel to 100 percent hydrogen in the new 840-MW IPP turbine units (**Exhibit 7**). The summary includes early estimates of water use by the Project for construction and operation. As shown, the current annual 12,500 acre-feet water use by the IPP would be reduced to approximately 6,500 acre-feet from using hydrogen fuel, as compared to coal-fired operation. In addition, the summary shows that even a combined total of water use by the IPP and Project during operations would be a significant reduction.

Based on the IPA summary, findings of the Utah State Engineer, evaluation of DWRi, and findings of the 2010 and 2015 FERC EAs, the Project-related impacts on surface water and groundwater quantity would not be significant. Rather, this analysis shows a long-term benefit would result from the construction and operation of the Project and the IPP using hydrogen fuel.

[4] Condrat, George W. and William D. Loughlin, (2022), Aquifer Capacity Assessment ACES I Project, Millard County, Utah, for ACES I, LLC. Dated February 2022: Loughlin Water Associates, LLC, Park City.

**Exhibit 7: Reduction of Water Usage Resulting from IPP Transition to Hydrogen Fuel**




### *3.4.3 Groundwater Quality*

Potential impacts on groundwater quality include contamination of USDWs through the introduction of brine resulting from the drilling and operations of storage caverns and the leakage of brine from the above-ground evaporation ponds. The surface water at the Project site is limited to ephemeral drainage channels, and the managed brine ponds. **Table 3** provides a description of the Sevier Desert River Basin Aquifer system below the Project site and the use of each aquifer within the system.

**Table 3: Sevier Desert River Basin Groundwater Aquifer System**

| Depth (feet bgs) | Aquifer Name | Aquifer Description and Use |
|---|---|---|
| 0 to 250 | Shallow Water Table Aquifer | The shallow water table aquifer does not have confining zones and generally is not used due to high total dissolved solids and poor-quality conditions. Geotechnical studies show groundwater is typically 30–60 feet bgs. |
| 300 to 600 | Shallow Artesian Aquifer | This aquifer is generally used for agriculture and drinking water purposes. Confining zones vary in thickness and location and include several hundred feet in the depth range. |
| 700 to 1,400 | Deep Artesian Aquifer | This aquifer is generally used for industrial and drinking water purposes and will be used by IPP and the Project for operations. Confining zones vary in thickness and location and include several hundred feet in the depth range. |
| > 1,650 to 3,000 | Basement Artesian Aquifer | This aquifer extends to bedrock or the salt structure and includes several small inter-bedded sand and gravel units within significant silt and clay zones. It is used by Sawtooth for the construction of storage caverns and ongoing operations. |

As described in Section 2, the engineering, construction, and design measures for the storage cavern wells include a complex casing system. The system includes four concentric steel casings that will be drilled and cemented through the water bearing units of the groundwater aquifer system and into the salt dome. Of the four concentric steel casings, one will extend to the top of the salt dome located roughly 3,200 feet bgs, and two will be cemented directly into the salt. This design will provide a continuous barrier with three levels of protection against the contamination of USDWs.

During the multiyear construction period of the storage caverns, the brine generated from the solution mining will be discharged in the brine evaporation ponds. The brine evaporation ponds have been designed with three levels of groundwater protection to prevent the leakage of brine into the shallow water table aquifer. As described in Section 2 and depicted in **Figure 2**, brine ponds are lined with two synthetic geomembrane liners installed over the compacted and engineered pond floors, with under-liner drainage system. Any leakage collected between the two liners and by the under-liner is designed to drain into a sump that cycles the brine back into the pond. An array of shallow groundwater monitoring wells would also be installed upgradient and downgradient of the ponds to detect any brine that may not get captured by the under-liner drainage system.

Based on the lack of surface water at the Project site, the groundwater protection measures incorporated into the facility design, and the previous findings of the 2010 and 2015 FERC EAs, the Project-related impacts on surface or groundwater quality or USDWs would not be significant.

## 3.5 Biological Resources

The following discussion of biological resources reviews impacts on general vegetation; general wildlife, including Utah Division of Wildlife Resources (UDWR) Species of Greatest Conservation Need (SGCN); migratory birds protected under the Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA); and threatened and endangered species protected under the Endangered Species Act (ESA). The affected environment and potential Project-related impacts on these resources are described in the sections below.

### *3.5.1 General Vegetation*

As described in the 2010 and 2015 FERC EAs, five general vegetation cover types occur in the general Project area, with only two cover types within the Project site—weedy shrub and weedy grassland vegetation communities. These vegetation cover types have been subject to land use practices that have left the area dominated by weedy, invasive species, including cheatgrass (*Bromus tectorum*) and western seepweed (*Suaeda occidentalis*). Ongoing industrial and agricultural activities in the area have reduced the quality of these cover types at the Project site. The weedy shrub cover type is dominated by greasewood (*Sarcobatus vermiculatus*) with sparse yellow rabbitbrush (*Chrysothamnus viscidiflorus*) in some areas. The dominant understory plant species is cheatgrass, with dense patches of western seepweed in some areas. The weedy grassland cover type is dominated by cheatgrass with western seepweed in some areas. The approximate acreages of impact by vegetation cover type are summarized in **Table 4**, below.

**Table 4: Project-Related Vegetation Disturbance**

| Cover Type | Total Area on ACES Delta Property (acres) | Disturbance Area (acres) | |
|---|---|---|---|
| | | Construction | Operation |
| Weedy Shrub | 4,647 | 563.5 | 436.5 |
| Weedy Grassland | 423 | 168 | 168 |
| *Vegetation Subtotal* | *5,070* | *731.5 (14%)* | *604.5 (12%)* |
| Developed Areas<br>Existing IPP and utility ROWs | 214 | 15 | 15 |
| **Total Disturbed Acres** | **5,284** | **746.5** | **619.5** |

As shown in **Table 4**, approximately 731.5 acres of existing vegetation within the Project site would have impacts during construction, with approximately 604.5 acres permanently converted to developed area. Approximately 127 acres of temporary disturbance (lay down yards and utility corridors) would be reclaimed, reseeded, and allowed to revegetate following construction and in compliance with the invasive species management (see Appendix C).

Based on the low quality of the general vegetative habitat affected, the permanent loss of approximately 12 percent of the available vegetative habitat, and the implementation of the Reclamation and Weed Management Procedures and the Environmental Compliance and Monitoring Plans and Procedures, the Project-related impacts on general vegetation would not be significant.

### *3.5.2 General Wildlife*

The wildlife habitat types that would be affected by Project construction and operation are the weedy shrub and grassland habitats described in the general vegetation section. These habitats have been substantially degraded by historical land use practices that have left the area dominated by weedy, invasive species, including cheatgrass and western seepweed. In addition, large industrial complexes are present to the immediate north and east, and agricultural land uses are approximately 1 mile to the southwest.

Despite the relatively low-quality habitat present on site, a variety of common wildlife species are known to use the area. Species documented in and around the Project site include the American badger (*Taxidea taxus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), black-tailed jackrabbit (*Lepus californicus*), chisel-toothed kangaroo rat (*Dipodomys microps*), desert cottontail (*Sylvilagus audubonii*), bobcat (*Lynx rufus*), and gopher snake (*Pituophis catenifer*). Other wildlife species with potential to occur on site include the pronghorn (*Antilocapra americana*), striped skunk (*Mephitis mephitis*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), northern grasshopper mouse (*Onychomys leucogaster*), North American deermouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), and Great Basin pocket mouse (*Perognathus parvus*). Two UDWR SGCN designated species—the kit fox (*Vulpes macrotis*) and burrowing owl (*Athene cunicularia)*—have been identified as potentially occurring on the Project site based on the presence of habitat that may support these species. Species-specific surveys identified the presence of low-quality habitat for both the kit fox and burrowing owl, and no burrows capable of supporting these species' breeding, nesting, or young rearing were identified (Martin and Nicholson 2021[5]). Pre-construction burrow survey and collapse activities were conducted on the Project site in February and March 2022. In addition, previous and recent surveys documented that the Project site contains no UDWR-designated big game crucial ranges. ACES has incorporated 8-foot-high exclusionary fences around the perimeter of Project facilities to keep big game out of the property and ponds. Also, the Project site is not located within UDWR-mapped occupied habitat for the greater sage-grouse (*Centrocercus urophasianus*), a SGCN designated species.

Construction and operation of the Project would result in temporary to permanent displacement and disturbance of commonly occurring wildlife using the habitat within and immediately adjacent to the Project site. The displacement and disturbance of wildlife could result in mortality or injury for affected individuals, especially those of less mobile and ground-nesting and fossorial (burrowing) species; however, mobile species would likely transition to adjacent suitable habitat. Additionally, construction and operation of Project facilities would result in the loss of and long-term modification and fragmentation of wildlife habitat. Implementation of the Reclamation and Weed Management Procedures and the Environmental Compliance and Monitoring Plans and Procedures (see Attachment C) would reduce the impacts on general wildlife resulting from the modification and fragmentation of wildlife habitat.

Based on the permanent loss of approximately 12 percent of the available wildlife habitat, the protocols and procedures that are designed to avoid and minimize impacts on wildlife, as well as the existing actively disturbed and degraded wildlife habitat, Project-related impacts on general wildlife, wildlife habitat, and SGCN-designated species would not be significant.

[5] Nicholson, Brian, (2021), Memorandum of Findings Special Status Species Habitat Assessment for ACES I, LLC. Dated August 2021: Martin & Nicholson Environmental Consultants, LLC, Park City, Utah.

### 3.5.3 Migratory Birds

Numerous species of migratory birds are known or have potential to use the Project site and could be affected by construction and operation of the Project. As indicated by the weedy vegetation cover types described above, wildlife habitats in the Project site have been degraded over time. Nonetheless, these habitats help to support migratory birds year-round, including during the breeding season for species that winter in the south and during the winter for species that breed in the north. The loss, conversion, modification, and fragmentation of wildlife habitat and vegetation resulting from construction and operation of the Project could result in adverse impacts on migratory birds. Migratory birds could experience mortality, injury, or stress due to collisions with Project infrastructure as well as the loss and further degradation of habitat quality on site. Migratory birds could also be displaced from the Project site from noise, traffic, and increased levels of human activity during construction.

In addition to the potential impacts on migratory birds resulting from Project construction, operation of the brine evaporation ponds could also affect these species. The two brine evaporation ponds would, in effect, become new surface waterbodies and potential habitat for migratory birds, primarily waterfowl and other waterbirds. Extensive biological monitoring surveys were completed on the existing adjacent brine evaporation ponds between October 2013 and December 2014. The biological monitoring effort documented shorebirds, waterfowl, gulls, and raptors using the existing brine evaporation ponds and other habitats in the immediate vicinity of the ponds. During the monitoring period, no brine-pond-related stress, injury, or mortality of migratory birds was observed (Magnum 2016[6]). These monitoring results provide a strong indication that operation of the existing ponds and, by extrapolation, the Project ponds would have no adverse effects on migratory birds.

In addition to protocols and procedures that are designed to avoid and minimize impacts on general vegetation and wildlife described previously, and in accordance with Wildlife Management Measures, the Applicant would avoid construction between April 1 and July 15, or follow the UDWR- and SITLA-approved avian impact mitigation measures, to minimize potential impacts on migratory birds during the breeding season. If ground-disturbing activities cannot be avoided during this period, the Applicant would follow the UDWR- and SITLA-approved avian impact mitigation measures or complete nest clearance surveys no more than 10 days prior to the start of construction to ensure that affected lands are not occupied by nesting migratory birds. If active nests are found during pre-construction nest clearance surveys, they would be avoided until young have fledged or the nest is abandoned.

Based on the implementation of the protocols and procedures designed to avoid and minimize impacts on general vegetation and wildlife, as well as the migratory bird measures discussed above, impacts on migratory birds resulting from Project construction and operations would not be significant.

### 3.5.4 Threatened and Endangered Species

Previous surveys completed between 2008 and 2016 in the Project area documented that no U.S. Fish and Wildlife Service (USFWS)-listed species identified as threatened, endangered, candidate, or proposed under the ESA or designated critical habitat are present in the area.

A current review of the Information for Planning and Consultation (IPaC) database in July 2021 identified a potential for USFWS-listed species Ute ladies'-tresses (*Spiranthes diluvialis*) to occur within the Project area. Based on the results of the IPaC database review, the Project site was surveyed in July 2021. The survey found that suitable habitat for Ute ladies'-tresses does not occur within the ACES property and Project site (Martin and Nicholson 2021[7]).

Because the results of the previous and current surveys document that suitable habitat for the Ute ladies'-tresses is not present on the Project site, and because no designated critical habitat is present on the

[6] Magnum NGLs, (2016), Avian Monitoring Plan Monitoring Reports for the Magnum NGLs Storage Facility, Millard County, Utah. Dated January - December 2016: Reports on file with Sawtooth Caverns, LLC (fka Magnum NGLs. LLC), School and Instutional Trust Lands Administration and Division of Wildlife Resources, Salt Lake City, Utah.

[7] Nicholson, Brian, (2021), Memorandum of Findings Special Status Species Habitat Assessment for ACES I, LLC. Dated August 2021: Martin & Nicholson Environmental Consultants, LLC, Park City, Utah.

Project site, DOE has determined that the Project would have no effect on listed threatened or endangered species or on designated critical habitat.

## 3.6 Cultural Resources

A series of cultural resources inventories have been completed within the larger Property and Project site between 2008 and 2021. These surveys have allowed the Applicant to plan the layout of Project facilities to avoid where possible impacts on cultural resources eligible for listing on the National Register of Historic Places (NRHP).

One NRHP-eligible site (42MD3308) would be crossed by a Project road in two areas that have been previously disturbed. Site 42MD3308 is an unlined, earthen historic canal that is a large-scale landscape feature running across both private and SITLA lands within and outside the Project site. The canal was dug to support the initial establishment of agriculture in the area but was abandoned in the 1930s. As such, the canal has suffered significant disturbance to segments over the years through natural erosion as well as industrial and community use of the landscape.

The two Project road segments that cross the historic canal consist of an existing gravel road constructed by Millard County and a newly constructed road segment for the Project. Both road crossings of the canal are in areas that have been heavily disturbed by previous construction as well as sustained grazing activity. DOE has reviewed the Project's impact on the canal and found that the Project would not result in damage or destruction that would affect the canal's eligibility for the NRHP, would not cause a change in the use of or physical features of the property's setting, and would not result in neglect of the property. The Utah State Historic Preservation Officer (SHPO) concurred with DOE's no effect finding on January 31, 2022. The correspondence and support material specific to the SHPO concurrence are provided in Appendix B.

During Project construction, the Applicant will employ a cultural resource monitor to observe construction activity of the new road segment in in the vicinity of Site 42MD3308. The monitor will ensure that the new roadway construction stays within the easement boundary for the road and does not result in impacts on other areas of the canal outside the boundary. In addition, the Applicant will implement the following Unanticipated Discoveries Procedures to address any unidentified subsurface resources that are encountered during construction or operations:

- An orientation of all employees and company consultants and construction workers will be conducted and will cover the protection of cultural resources within the Project and the appropriate actions to take if a cultural resource is encountered.
- In the event a cultural resource is encountered during construction, work will be stopped temporarily in the immediate area of the unanticipated discovery.
    - A qualified cultural resources consultant will be contracted to be on call to immediately assess and document the identified cultural resource for NRHP eligibility.
    - Additional cultural resources monitoring will be conducted as necessary if the cultural resources consultant believes the discovery is part of a larger depositional context rather than an isolated site.

Based on DOE's finding and the SHPO's concurrence of no adverse effect on historic properties and the implementation of the additional measures, Project construction and operation would have no adverse impacts on cultural resources. Consequently, Project-related impacts on cultural resources would not be significant (Appendix B).

### *3.6.1 Native American Interests*

DOE has contacted the following Native American Tribes with potential interests in the Project site:

- Confederated Tribes of the Goshute
- Skull Valley Band of Goshute
- Hopi Tribe

- Kaibab Band of Paiute Indians
- Paiute Indian Tribe of Utah
- Paiute Indian Tribe of Utah – Indian Peaks Band
- Paiute Indian Tribe of Utah – Kanosh Band
- Paiute Indian Tribe of Utah – Cedar Band
- Paiute Indian Tribe of Utah – Shivwits Band
- Paiute Indian Tribe of Utah – Koosharem Band
- Ute Indian Tribe
- Navajo Nation

Letters outlining the location and scope of the Project and affording Tribes the opportunity to comment and engage DOE in government-to-government consultation on the Project have been sent to the Tribes identified below. Appendix B contains the support material, a sample letter, and Tribal responses associated with this consultation. To date, the Kaibab Band of Paiute Indians have responded that they have no concerns regarding the Project (Appendix B).

Because of the low likelihood of traditional cultural properties occurring within the Project site as evidenced by previous and current DOE tribal correspondence, past and updated assessment of the Project site with SHPO concurrence (Appendix B), the disturbed nature of the site, and the controls in place in the event of an unanticipated discovery of cultural resource materials, impacts on cultural resources—including Native American interests—as a result of the Project would not be significant.

## 3.7 Socioeconomics and Environmental Justice

### *3.7.1 Socioeconomics*

The Project is located in Millard County, Utah. According to the 2020 U.S. Census, Millard County has a population of 12,975. Towns near the Project site include the cities of Delta (9 miles south of the Project site, population of 3,622) and Hinckley (12 miles south-southwest of the Project site, population 614) and the unincorporated community of Sutherland (7 miles south of the Project site, population 147).

According to the 2020 census, the population of Millard County is composed of 7.7 percent people under 5 years old, 31 percent under 18 years old, 69 percent 18 years and over, and 17.8 percent over 65 years of age. The percentage of females in the county is approximately 49 percent. The median household income in Millard County is $63,221, and the average commute time is approximately 17 minutes. The proportion of people below the poverty line in Millard County is 10.7 percent, which is greater than the 7.3 percent for the State of Utah and slightly less than the 11.4 percent of people below the poverty line for the nation as a whole.

During Phase 1 construction, between 2022 to 2026 employment will range from 50 up to as many as 500 workers per 24-hour day (5 days per week) and will average approximately 300 workers per day over that period. The peak period for Phase 1 construction is expected to last for 15 months between January 2023 and April 2024, after which the number of workers will return to approximately 50 per day until construction is complete.

In 2025, Phase 2 construction will have a similar range in the number of workers as Phase 1 construction. The labor force in Phase 2 will, in effect, be a continuation of the Phase 1 labor force, with a peak in average of 300 workers per day between 2024 and 2025 decreasing to 50 workers in 2026 through the end of construction. Operation of Phase 1 and Phase 2 will require approximately 18 to 20 full-time workers on site. It is anticipated that some of the construction workers would come from Delta and the surrounding communities but that many would come from the greater population center located along the Wasatch Front, approximately 85 miles to the northeast.

The Project lies within a zoned heavy industrial area with industrial development to the immediate north and east, agricultural fields and scattered residences to the south and southwest, and open, undeveloped lands to the west and northwest. The nearest hospital is located approximately 12 miles south of the Project, and the nearest schools are located approximately 11 miles south of the Project site.

Beneficial socioeconomic impacts would occur from increased employment opportunities, tax revenue generation, and direct and indirect spending in the local economy. The Project is consistent with the "Economic Development" section of the Millard County General Plan, which states that the county will encourage economic growth that is compatible with the county's character and lifestyle. Based on the Applicant's previous projects in the area, the majority of the Project workforce is anticipated to be hired from Millard County and adjacent counties. In addition to bolstering the local economy through employment, Project construction and operation will benefit local businesses through the purchase of materials and services needed for construction and operations and the use of local goods and services by the influx of workers and contractors. Other than specialty equipment requiring off-site fabrication, the Project will purchase materials locally if available at competitive prices.

With annual Phase 1 property taxes ranging between $250,000 and $8 million and annual federal and state income taxes ranging between $7 million and $14 million, tax revenues generated by the Project are likewise expected to have a positive impact in supporting local and state government services and reducing the pressure to increase property tax rates to meet budget needs. The tax revenue resulting from the addition of Phase 2 has not been fully analyzed; however, it is expected to increase proportionally to the addition of lands associated with the Project expansion.

In addition, much of the Project site is on lands leased from SITLA. The Project's lease payments and royalties to SITLA would result in an increase of $1.2 million to $5 million in annual royalty payments to SITLA during operation of Phase 1, a substantial increase in local payroll during construction, and the creation of 18 to 20 long-term jobs with combined salaries totaling between $2 million and $4 million per year during its operational life. The Project is expected to have a positive economic impact on the State of Utah, including Utah's public schools through SITLA royalties as well as on Millard County and the Delta area in particular. The SITLA royalties expected to be generated from Phase 2 have not been fully analyzed; however, it is expected that royalties will increase proportionately to the increase in the electrical generation capacity of the Project.

Although the Project will contribute considerable tax revenue to Millard County, it will have little impact on county services and resources because its power, water, and sewer hookups are not part of county systems. Moreover, no new housing or other infrastructure is anticipated to be needed to support construction or operation of the Project, as Delta and the surrounding area have available housing and associated infrastructure to support an influx of residents resulting from construction and operation jobs created by the Project.

Based on the jobs that would be created during Project construction and operation; the tax revenues and lease and royalty payments that would be generated by the Project; and the availability of housing and public services in Delta and the greater Millard County area, the Project would have no significant adverse effects on the socioeconomics of the surrounding area but would instead result in substantial economic benefits.

### *3.7.2 Environmental Justice*

LPO's review of environmental justice issues focuses on Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," the National-Scale Air Toxics Assessment (NATA) cancer risk and respiratory hazard index as defined in the U.S. Environmental Protection Agency's (EPA's) EJ screening tool, and any site-specific population centers (e.g., schools, day-care centers) near the Project site. Executive Order 12898 directs federal agencies to address environmental and human health conditions in minority and low-income communities. The evaluation of EJ is dependent on determining if high and adverse impacts from the Project would disproportionately affect minority or low-income populations in the affected community.

In accordance with EPA's EJ guidelines, minority populations should be identified when either: 1) the minority population of the affected area exceeds 50 percent; or 2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. **Table 5** summarizes the racial/ethnic composition of Millard County, the State of Utah, and the U.S. **Table 6** provides information from the EPA's EJ screen for two census tracts that encompass the Project site.

**Table 5: Population and Ethnicity (Information from U.S. Census)**

| Ethnicity | Millard County, UT | Utah | United States |
|---|---|---|---|
| Total population | 12,975 | 3,271,616 | 331,449,281 |
| White | 93.8% | 90.6% | 76.3% |
| Black | 0.6% | 1.5% | 13.4% |
| Native American | 2.1% | 1.6% | 1.3% |
| Asian | 1.6% | 2.7% | 5.9% |
| Pacific Islander | 0.2% | 1.1% | 0.2% |
| Hispanic | 12.9% | 14.4% | 18.5% |
| Persons in Poverty | 10.7% | 7.3% | 11.4% |

**Table 6: Selected Variables from EPA EJ Screen**

| Ethnicity | Value | State Average | Percentile in State | U.S. Average | Percentile in U.S. |
|---|---|---|---|---|---|
| NATA* Cancer Risk (lifetime risk per million) | 10 | 21 | 14 | 29 | <50th |
| NATA* Respiratory Hazard Index | 0.2 | 0.3 | 28 | 0.36 | <50th |
| People of Color Population | 17% | 22% | 51 | 40% | 32 |
| Low Income Population | 37% | 27% | 74 | 31% | 64 |

*Tract: 49027974100, 49027974200 UTAH, EPA Region 8. Approximate population: 7,942.*

** More information on the NATA can be found at: https://www.epa.gov/national-air-toxics-assessment*

Although the EJ screen shows that the minority population of the Project area is in the 51st percentile for the state (**Table 6**), the racial/ethnic composition of the population of Millard County is less than 15 percent and is not substantially different than that of the State of Utah (**Table 5**). The persons in poverty is 37 percent, which is in the 74th percentile for the state and 64th percentile for the U.S. However, the low income population is slightly higher in Millard County as compared to the state (10.7 percent versus 7.3 percent) but is lower than the U.S. as a whole (11.4 percent) (**Table 5**).

Since the Project site is not located near any schools, daycare facilities, playgrounds, or other places where children would frequent, and due to security procedures (e.g., perimeter fencing, lighting, and 24-hour surveillance) for the Project, children trespassing on the Project site are not expected. Therefore, children would not be affected disproportionately from environmental health and safety risks.

The Air Toxics Cancer Risk and Air Toxics Respiratory Hazard indices are below the 50th percentiles for the state and the U.S. for the evaluated census tracts. The Project goals are to shift the generation of energy that will reduce emissions, as discussed in Section 3.3.2, Greenhouse Gas Emissions. As such, the Project would result in no negative impacts.

Based on the jobs created during construction and the 18 to 20 jobs created, the Project would benefit the regional economy. There are no anticipated impacts that could give rise to disproportionate impacts on minority or low-income populations in the affected area.

## 3.8 Public and Occupational Health and Safety

The potential for risks to public and occupational health and safety from Project-related activities during construction and operation were evaluated as part of the FEED. The identified risks include hazards associated with the hydrogen generation and storage process such as contact or an accidental release, equipment failure, employee and facility operator errors, and emergency or security situations. As discussed in Section 2, the evaluation involved the completion of a PHA to identify and development of an SID that incorporated measures to address the specific Project-related design, construction, and

operations safety requirements. A final PHA would also be completed as part of the final facility design before construction and routinely during operations.

To address these potential risks, the Project would be designed, constructed, and operated in accordance with applicable federal, state, and local regulations, standards and requirements and industry BMPs. At this time, the current Project-design has incorporated measures to address risks identified from the PHA and to meet PSM requirements and industry BMPs. These measures include equipment and material selection appropriate for the generation, handling and storage of hydrogen gas; established minimum distances between certain hydrogen generation and handling equipment; the installation of a facility-wide leak detection and emergency shutdown system; and emergency and fire response and suppression measures and plans.

During construction, Project contractors would be required to develop and implement site-specific occupational health and safety plans that would meet applicable regulations, standards, and requirements and Project permits and industry BMPs. During operations, the Project would also establish Standard Operating Plan based on BMPs, Project Environment, Health and Safety/Environmental, Social and Governance (EHS/ESG) plans and maintaining compliance with federal Occupational Safety and Health Administration (OSHA) regulations, EPA Risk Management Plan (RMP) rules, and the state rules under the Utah Occupational Safety and Health Act (UOSHA).

Specifically, OSHA Standard 1910.119 for PSM of highly hazardous chemicals contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals.

The PSM requirements are applicable to the hydrogen generation and storage facilities and would be the foundation for the Project design, construction, and operations plans. Compliance with the PSM requirements would serve to mitigate the hazards to employee, public, and environmental health and welfare identified by the PHA.

In addition to the requirements of OSHA PSM, the EPA requires a RMP to be established during operations for chemical accident prevention when facilities have more than a threshold quantity of a regulated substance in a process, including storage of that substance. The Project would have quantities of hydrogen that exceed the threshold quantity of 10,000 pounds. To ensure a safe work environment, the Project would develop and implement an RMP that includes employee and contractor training with precautionary, preventative, and emergency response information regarding the potential release of hydrogen gas; requirements for employees and contractors to wear appropriate personal protective equipment; access to necessary response supplies in the event of accidental release; and information on how to respond in an emergency.

The Project would also develop and maintain emergency response and site security plans as part of the EHS/ESG plans to address injuries, fires, spills, hazardous material leaks, and operational safety. The plans would be used by personnel to minimize both human health and safety concerns, and environmental impacts. The details of emergency response plans would be developed in conjunction with the public emergency response services and neighboring community as part of the RMP.

Emergency response and medical services for the Project site would largely be provided from Delta, Utah, which is located approximately 12 miles to the south of the Project site. The local sheriff's department and fire department both have the capability to respond to emergencies and, if necessary, the fire department can manage triage injuries until the emergency personnel from Delta Community Hospital arrive to provide transportation to the most appropriate medical services location. The local fire department would be informed of potential Project-related hazards associated with both construction and operations and would be provided a Project site plan to ensure that first responders and the public are also protected from exposure to potentially hazardous situations in the event of a fire or industrial accident.

Security-related concerns would be addressed through the development and implementation of a site security plan that includes full 24-hour controlled access, including permanent fencing installed around the perimeter with badge-entry access points to enter. To protect the public during the construction phase of the Project, additional temporary fencing would be erected to enclose the temporary construction areas, with additional permanent fencing to be added to surround the expanded facilities once

construction would be completed. Public access to the site would be restricted to the gated main entrance. In addition, nighttime security lighting would be installed, and the Project would be under 24-hour surveillance with on-site security personnel.

By meeting the applicable federal, state, and local regulations—including OSHA PSM, EPA RMP, and UOSHA—and establishing EHS/ESG plans during construction and operation that will promote a safe and healthy workplace, the Project would not represent a significant risk to Project employees, contractors, or nearby businesses and communities or represent a significant impact on the environment.

## 3.9 Waste Management

Project-related waste streams produced during construction and operations will be limited to fluids and materials that are not considered toxic or hazardous. During construction, Project-related waste streams will include waste created during general construction activities and the brine produced through solution mining the hydrogen storage caverns. Waste produced during general construction activities will include relatively clean construction and building materials such as, wood, plastics, glass, metal scrap (steel, aluminum, etc.), surplus concrete, and other packaging materials. These waste streams will be collected, diverted, and sorted for recycling or disposed of at an approved solid waste landfill. In addition, Project contractors will be required to establish a SPCC Plan to address and appropriately dispose of any liquid waste and spills that would result from equipment or construction activities. They will also be required to appropriately manage human waste generated from construction activities.

The brine produced during solution mining is non-toxic, and testing indicates the chemical composition is 98.5 percent sodium chloride and 1.5 percent anhydrite. During construction, as brine is created it would be piped from the caverns and discharged for storage into the two brine evaporation ponds (see **Figure 2**). As described in Section 2, the ponds would be designed to have a capacity between 5,000 and 7,000 acre-feet and a double liner and leak detection system with a leak collection and recovery system between and beneath the liners. The double liner and leak detection and collection systems would ensure that any brine is contained within the ponds and does not result in releases that would cause environmental or public health and safety concerns. To reduce the risk of an overfilling event, the DWQ requires that the pond level is maintained with 3 feet of freeboard. In addition, to prevent contamination of groundwater, the Project would implement a Groundwater Monitoring Plan approved by the DWQ.

During operations, Project-related waste streams would include the long-term management of the stored brine produced during construction, cooling tower water associated with the hydrogen generation facility, and general waste associated with normal operations. Given that the purpose of the brine evaporation ponds is for long-term storage, during operations the ponds will be operated and maintained in accordance with the requirements of DWQ and DWRi permits. When the brine in the ponds is fully evaporated, the pond berms will be removed and the residual salt will be left on site. As described in the 2010 and 2015 FERC EAs, the residual salt will be covered with an impermeable liner and 4 feet of soil, then the surface would be reclaimed through standard practices. Alternatively, the chemical composition of the salt is such that it could also be removed for commercial sale if a market opportunity was identified and the applicable approvals and authorizations were obtained by the Applicant.

During operations, it is estimated that the peak volume of cooling water discharged from the hydrogen generation facility would be approximately 106 acre-feet annually (approximately 65 gpm) during Phase 1 and would increase to approximately 254 acre-feet (approximately 157 gpm) during Phase 2. The cooling tower water generated by the electrolyzer units is not toxic and would also be piped from the hydrogen generation facility to a small evaporation pond for storage (see **Figure 2**). When completed, the evaporation pond design for the cooling tower water would include similar elements as that of the brine evaporation ponds such as a liner and a capacity that allows for an appropriate level of freeboard to precent overtopping.

Similar to construction, waste produced during normal operations would include human waste, wood, plastics, glass, and other packaging materials as well as liquid waste from equipment and facility maintenance activities. When generated, these waste streams would be collected, diverted, and sorted for recycling or disposed of at an approved solid waste landfill. The Project would also establish a facility-wide SPCC Plan to address and properly dispose of any liquid waste created during operations.

Based on the design measures of the evaporation ponds and the non-toxic or hazardous composition of brine, cooling tower water and waste produced during construction and operations, Project-related impacts during construction and operations would not be significant.

## 4.0 FINDING

Based on this EA, DOE has determined that providing a federal loan to ACES to produce and store hydrogen at their facility will not have a significant effect on the human environment. The preparation of an EIS is therefore not required, and DOE is issuing this FONSI.

Todd E. Stribley Digitally signed by Todd E. Stribley Date: 2022.04.26 09:45:02 -06'00' April 26, 2022

Todd Stribley Date
NEPA Document Manager
Director, Environmental Compliance
DOE Loan Programs Office

# 5.0 LIST OF AGENCIES CONTACTED

- Millard County Planning Administrator
- U.S. Fish and Wildlife Service
- Utah Division of Air Quality
- Utah Division of Water Quality
- Utah Division of Water Rights
- Utah Division of Wildlife Resources
- Utah Public Lands Policy Coordination Office
- Utah State Historic Preservation Office
- Utah State and Institutional Trust Lands Administration

# 6.0 LIST OF PREPARERS

## 6.1 DOE

- Todd Stribley, M.S. Environmental Science and Public Policy, 29 years' experience
- Robert Lanza, P.E., M. Eng. Chemical Engineering, ICF (DOE contractor), 40 years' experience

## 6.2 Applicant

- Tiffany A, James, M.A. Anthropology and History. ACES, 20 years' experience.
- R. Spencer Martin, M.E.M. Resource Ecology/Conservation Biology, Martin & Nicholson Environmental Consultants, LLC (ACES contractor), 30 years' experience

# APPENDIX A REQUIRED PERMITS AND AUTHORIZATIONS

# PROJECT-REQUIRED FEDERAL, STATE AND LOCAL PERMITS AND AUTHORIZATIONS

| Permit/Approval | Agency or Office | Status |
|---|---|---|
| **Federal** | | |
| Chemical Facility Anti-Terrorism Standards | U.S. Department of Homeland Security | Process initiation required after the start of operations. Determination anticipated in December 2025. |
| Section 404 Clean Water Act Consultation | U.S. Army Corps of Engineers | Complete. Delineation surveys indicate that there are no wetlands or waters of the U.S. within the property or ACES Project boundary. Determinations issued for entire ACES Delta Property including ACES I Project between 2012 – 2018 as lands were acquired. |
| Section 7 Endangered Species Act Consultation and Construction Authorization | U.S. Fish and Wildlife Service | Complete. Delineation surveys indicate that there are no threatened and endangered species within the Project site. Determination made January 2022. |
| Section 106 National Historic Preservation Act Clearance | DOE/State Historic Preservation Office | Complete. There are no adverse impacts on properties eligible for the National Register of Historic Places. Determination issued January 31, 2022. |
| **State** | | |
| Class III Underground Injection Control (UIC) for Salt Cavern Construction | Utah Department of Environmental Quality (UDEQ), Division of Water Quality (DWQ) | Complete. Original issued in 2010. Amended permit issued January 30, 2020 with no expiration. |
| Class V UIC for Salt Cavern Operation | UDEQ, DWQ | Complete. Permit issued April 20, 2022 following a 30-day public comment period. . |
| General Construction Activities - Stormwater Permit | UDEQ, DWQ | In process. Permit involves a routine administrative filing of Notice of Intent with a Stormwater Pollution Prevention Plan. Issuance anticipated in March 2022. |
| Dam Impoundment Construction and Operations Permit, Brine Pond 4 | Utah Department of Natural Resources (UDNR), Division of Water Rights (DWRi) | Complete. Permit issued March 12, 2021 for one year term with administrative renewals. A 1-year extension of the construction authorization was issued April 6, 2022. |
| Dam Impoundment Construction and Operations Permit, Brine Pond 6 | UDNR, DWRi | Process initiation pending final design. Issuance anticipated in January 2023. |
| Dam Impoundment Construction and Operations Wastewater Pond | UDNR, DWRi | Process initiation pending final pond design. Issuance anticipated in January 2023. |
| Drinking Water System Permit | UDEQ, Division of Drinking Water | Process pending final facility design. No anticipated issuance as company may elect not to install a full drinking water system. |
| Groundwater Discharge Permit - Construction and Operations (Brine Pond 4) | UDEQ, DWQ | Complete. Permit issued on May 12, 2021 for a five-year term with renewal through administrative process. A one-year construction authorization with a renewal option is also included with this permit. A 1-year extension of the construction authorization was issued April 5, 2022. Amendment will be required to include Brine Pond 6 and the small wastewater pond upon completion of final design. Note: this is a corresponding permit to individual DWRi Dam Impoundment permits. |
| Groundwater Discharge Permit Amendment - Construction and Operations (Brine Pond 6) | UDEQ, DWQ | Process initiation pending final pond design. Amendment to existing permit for Brine Pond 4. Process initiation pending final design. Note: this is a corresponding permit to Individual Dam Impoundment permits. Issuance anticipated in January 2023. |

| Permit/Approval | Agency or Office | Status |
|---|---|---|
| Groundwater Discharge Permit Amendment -Construction and Operations (Wastewater Pond) | UDEQ, DWQ | Process initiation pending final pond design. Amendment to existing permit for Brine Pond 4. Process initiation pending final design. Note: this is a corresponding permit to Individual Dam Impoundment permits. Issuance anticipated in January 2023. |
| Groundwater Monitoring Wells Drilling Permits | UDNR, DWRi | Permitting process initiation pending final design. Permit involves a routine administrative filing of the final design of a typical for all wells. Issuance anticipated in September 2022. |
| Small Source Exemption for Air Quality Emissions - Construction and Operations | UDEQ, Division of Air Quality | Complete. Issued February 25, 2021 with no expiration date. |
| State Engineer Order for Temporary Change of Water Right Point of Diversion and Production Water Well Permits for Drilling | UDNR, DWRi | Complete. Issued Orders between 2009 and 2020 for individual water rights allocations as. Annual renewal of existing Orders is required and completed administratively by the agency. |
| State-Listed Species Clearance | UDEQ, Division of Wildlife Resources | Complete. Issued in 2017 with no expiration date. |
| Road Encroachment Permit | Utah Department of Transportation | Permitting process initiation pending final design. Permit involves a routine administrative filing of the final design by the EPC. Issuance anticipated in June 2022. |
| Wastewater System Permit | Central Utah Public Health Department | Permitting process initiation pending final design. Permit involves a routine administrative filing of final design. Issuance anticipated in June 2022. |
| **Local** | | |
| Building Permits | Millard County Building Inspection | Permitting process initiation pending final design. Permit involves a routine administrative filing of final design by EPC. Issuances anticipated between June 2022 and March 2023 for individual occupied structures. |
| County Road Encroachment Permits | Millard County Road Department | Permitting process initiation pending final design. Permit involves a routine administrative filing of the final design by the EPC. Issuance anticipated in June 2022. |
| Conditional Use Permit | Millard County | Complete. Originally issued in 2018. Amended and Restated permit issued December 15, 2020 with a six year term and two year administrative renewal available if construction has not commenced by the end of term. Permit runs with the land. |
| Fire, safety, and emergency response consultations | Millard County | No federal, state or local approvals or permit required. Consultation and courtesy notifications of fire, safety and emergency designs, plans and procedures ongoing. |
| Map Zone Change – Heavy Industrial | Millard County | Complete. Zoning change approvals completed for entire ACES Delta Property including ACES I Project between 2011 – 2017. |

# APPENDIX B AGENCY AND TRIBAL CORRESPONDENCE

# Agency Consultation

Utah Division of State History, State Historic Preservation Office

Utah Office of the Governor, Public Lands Policy Coordinating Office

Utah Division of Water Quality (DWQ), Groundwater Protection Unit (GPU)

Utah Division of Water Rights (DWRi), Dam Safety

Utah Division of Air Quality, Minor New Source Review Program Manager

Utah, Millard County Planner and Building Official

State of Utah, School and Institutional Trust Lands Administration

Consultations with the Utah Division of State History, State Historic Preservation Office

**Department of Energy**
Washington, DC 20585

January 25, 2022

Mr. Chris Merritt
State Historic Preservation Officer
Division of State History
300 Rio Grande
Salt Lake City, Utah 84101

**SUBJECT:** ACES I Project (Original Magnum Gas Storage Project: SHPO Case No. 09-0623)

Dear Mr. Merritt:

Pursuant to its authority under Section 1703 of the 2005 Energy Policy Act, the U.S. Department of Energy (DOE) Loan Programs Office (LPO) is considering whether to provide financial assistance (a loan guarantee) to ACES I, LLC (ACES) for the ACES I Project (Project) in Delta, Millard County, Utah. ACES has applied for financial assistance to support the development of the Project through the Renewable Energy and Efficient Energy (REEE) Projects Solicitation (Solicitation Number: DE-SOL-0007154) under Title XVII, Innovative Energy Loan Guarantee Program, authorized by EPAct. As part of the REEE Projects application process, the DOE must fulfill the requirements of the National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act and 36 CFR Part 800. The proposed DOE undertaking encompasses providing a loan to ACES to support the construction of a hydrogen production and long-duration storage facility approximately 10 miles north of Delta, Utah (Attachment 1). In accordance with our responsibilities pursuant to Section 106, we are requesting your concurrence with our Finding of No Adverse Effect for the Project.

**Project Description**

The Project is directly adjacent to the Intermountain Power Agency's Intermountain Power Plant (IPP) that is being re-powered from coal-fired to natural gas and hydrogen-fired. Once operational, the Project will provide a hydrogen fuel source for energy generation. The Project is expected to be constructed in two phases, with the first phase anticipated to begin in 2022 with operations beginning in 2024. Construction of the second phase will be timed after the first phase has been constructed and as the demand for hydrogen fuel increases. The enclosed Site Layout (Attachment 2) depicts the Project Area and the Project facilities, which include the following components:

- Four below ground salt storage caverns constructed using solution mining technology to store green hydrogen (two constructed during each construction phase);
- Ventilated shelters to house up to 550 MW of industrial electrolyzer units for the production of green hydrogen (220 MW installed during phase 1, and 330 MW installed during phase 2);
- Electrolyzer support facilities to include pumping systems, a cooling tower and detention pond for the electrolyzer units;
- Groundwater production wells and two brine evaporation ponds and associated shallow groundwater monitoring wells to support the solution mining of caverns and general operation and monitoring activities;
- Utilities including water, brine and storage product distribution pipelines, site distribution and high-voltage power lines, and microwave, digital and/or cellular communication lines, towers and equipment;
- An operations and maintenance office building, warehouse, and storage areas, well pads, and associated new gravel access roads; and,
- Four temporary laydown and staging areas to be used during construction that are located adjacent to the proposed cavern pads, electrolyzer units, brine evaporation ponds and substation respectively.

**Area of Potential Effects**

The Area of Potential Affect (APE) for both phases is limited to the extent of the Project Area (Attachment 3). This is due to the Project being within an active industrial development site and a Millard County-designated industrial area that already contains three existing industrial complexes: the Intermountain Power Agency Intermountain Power Plant, Sawtooth Caverns, LLC, and Materion.

**Description of Efforts to Identify Historic Properties**

As a part of the Section 106 identification process, ACES completed a cultural resource inventory within the ACES property, which included surveying land that was acquired between 2008 and 2021, to identify cultural resources that are eligible for listing in the National Register of Historic Places (NRHP). Previous cultural resource inventories were reviewed to identify known cultural resources; this list of previous surveys was previously submitted to the State Historic Preservation Office (SHPO) (Attachment 4). One previously undocumented area within the ACES property and associated with Brine Pond 6 was surveyed by a consultant, and the report documenting that survey is attached to this letter (Attachment 5).

**Description of Affected Historic Property**

One historic property will be affected by the proposed undertaking: Site 42MD3308. This site is an unlined, earthen, historic canal that is a large-scale landscape feature running across both private and SITLA lands within and outside the APE. The canal was dug to support the initial establishment of agriculture in the area but was abandoned in the

1930s. As such, the canal has suffered significant disturbance to various segments over the years through natural erosion as well as industrial and community use of the landscape.

**Undertaking's Effects on Historic Property**

As shown in Attachment 3, the Project will cross one NRHP-eligible site, 42MD3308, in two areas that have been previously disturbed. The two road segments that cross the historic canal consist of one existing gravel road constructed by Millard County and one road that will be newly constructed for the Project. Both road crossings of the canal (denoted by red circles on Attachment 3) are in areas that have been heavily disturbed by the previous construction and sustained grazing activity. Additional disturbances to the canal include other section line roads and fences as well as multiple high voltage power lines and associated maintenance roads. The first road segment that crosses the canal runs along the section line for Sections 26 and 27 in T15S R7W and has had a culvert installed under the existing County and private roadway to allow annual precipitation that collects in the canal to pass freely under the roadway. The second road segment that crosses the canal is in the SW ¼ of the NW ½ of Section 22 in T15S R7W.

**Application of the Criteria of Adverse Effect & Finding of No Adverse Effect**

The Criteria of Adverse Effect as described in 36 CFR Part 800.5(a)(2)(i-vii) are not applicable to this project. Physical damage to canal has already occurred around proposed construction site. The proposed canal crossing is in a location where the canal has been previously impacted by the construction of multiple high voltage power lines, the associated powerline maintenance road, other historic roads, and previous grazing activity. Therefore, this undertaking will not result in damage or destruction that will affect the canal's eligibility for the NRHP. The undertaking will also not result in the alteration of the property that is not consistent with the Secretary's Standards for the Treatment of Historic Properties. The undertaking will not remove the property from its location, will not cause a change in the use of or physical features of the property's setting, and will not result in neglect of the property. Additionally, the property is not owned by the Federal Government, and the introduction of project-related visual and audible elements is consistent with the current industrial setting of the area.

To further minimize effects to Site 42MD3308 by the Project, ACES will employ a cultural resource monitor to observe construction activity of the new road segment in Section 22 in T15S R7W. The monitor will ensure that the new roadway construction will stay within the easement boundary for the road and not impact other areas of the canal outside of the APE. In addition, ACES will implement the following Unanticipated Discoveries Procedures to mitigate impacts to any unidentified subsurface resources that are encountered during construction or operations within the APE:

- an orientation of all employees and company consultants and construction workers about the protection of cultural resources within the Project and the appropriate actions to take if a cultural resource is encountered;

- in the event a cultural resource is encountered during construction, work will be stopped temporarily in the immediate area of the unanticipated discovery;
- a qualified cultural resources consultant will be contracted to be on call to immediately assess and document the identified cultural resource for NRHP eligibility; and
- additional cultural resources monitoring as necessary if the cultural resources consultant believes the discovery is part of a larger depositional context rather than an isolated site.

We request your concurrence with this Finding of No Adverse Effect for the ACES I Project within thirty (30) days of receipt of this letter. If you have any questions or would like to discuss this project further, please contact me in the DOE Loan Programs Office at (303) 275-4549, or email at Todd.Stribley@hq.doe.gov.

Respectfully,

Todd Stribley

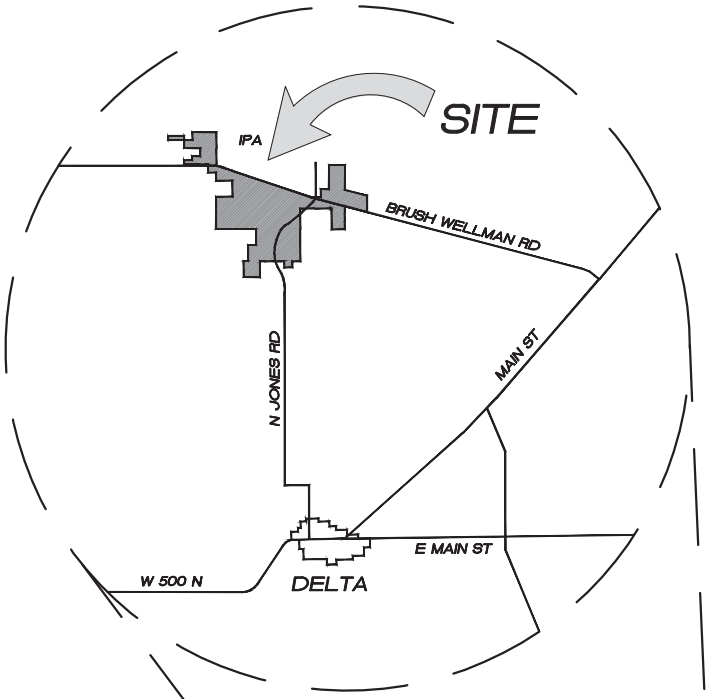
Todd Stribley
NEPA Document Manager
Loan Programs Office

cc: Savanna Agardy, Compliance Archaeologist

Attachments:
Attachment 1: Site Location Map
Attachment 2: Site Layout Figure
Attachment 3: ACES I Project – Map of Cultural Resources Surveys (Confidential) with Area of Potential Effects
Attachment 4: Citations of Cultural Inventory Reports
Attachment 5: A 2021 Supplemental Cultural Resources Inventory for the Previously Unsurveyed ACES I Projects Brine Pond 6 Area

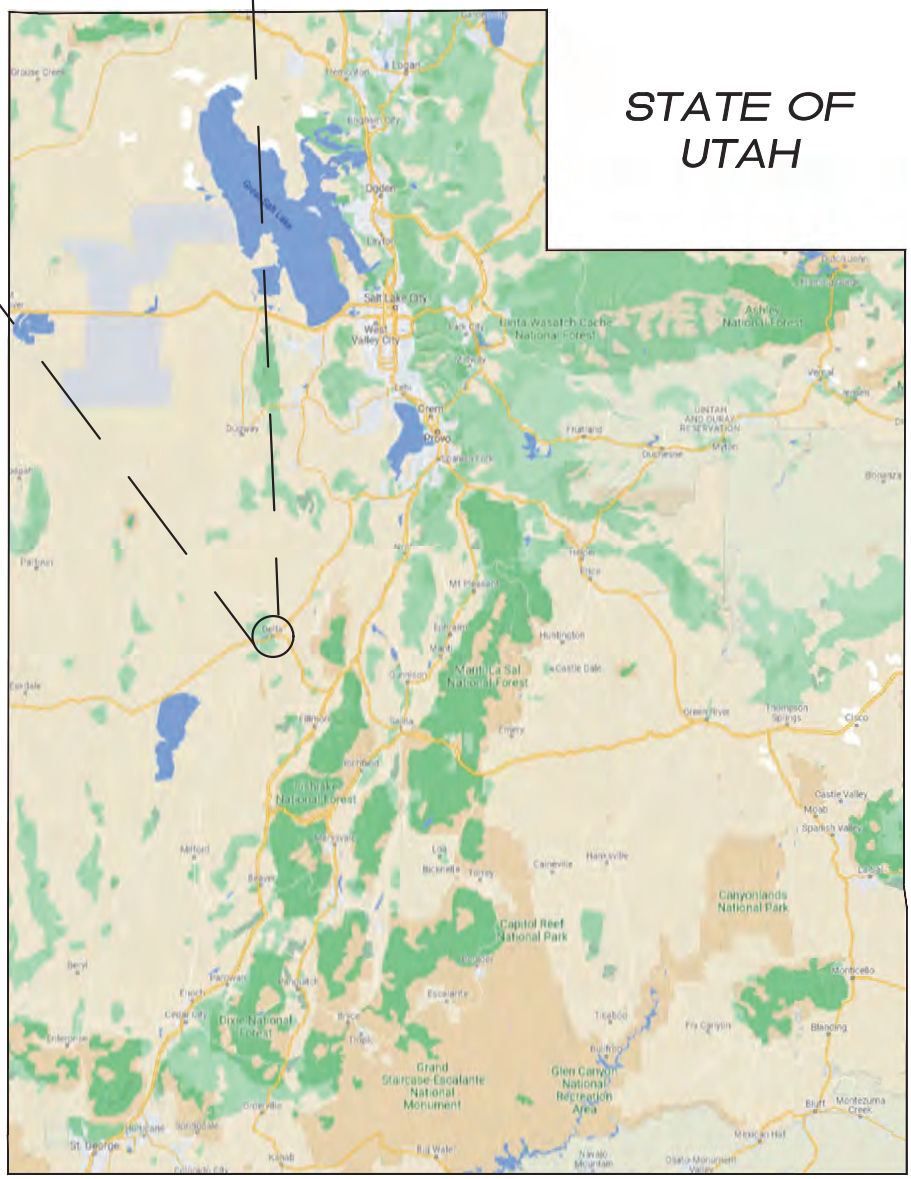
**Attachment 1**
**Site Location Map**

# ACES I GREEN HYDROGEN PROJECT LOCATION



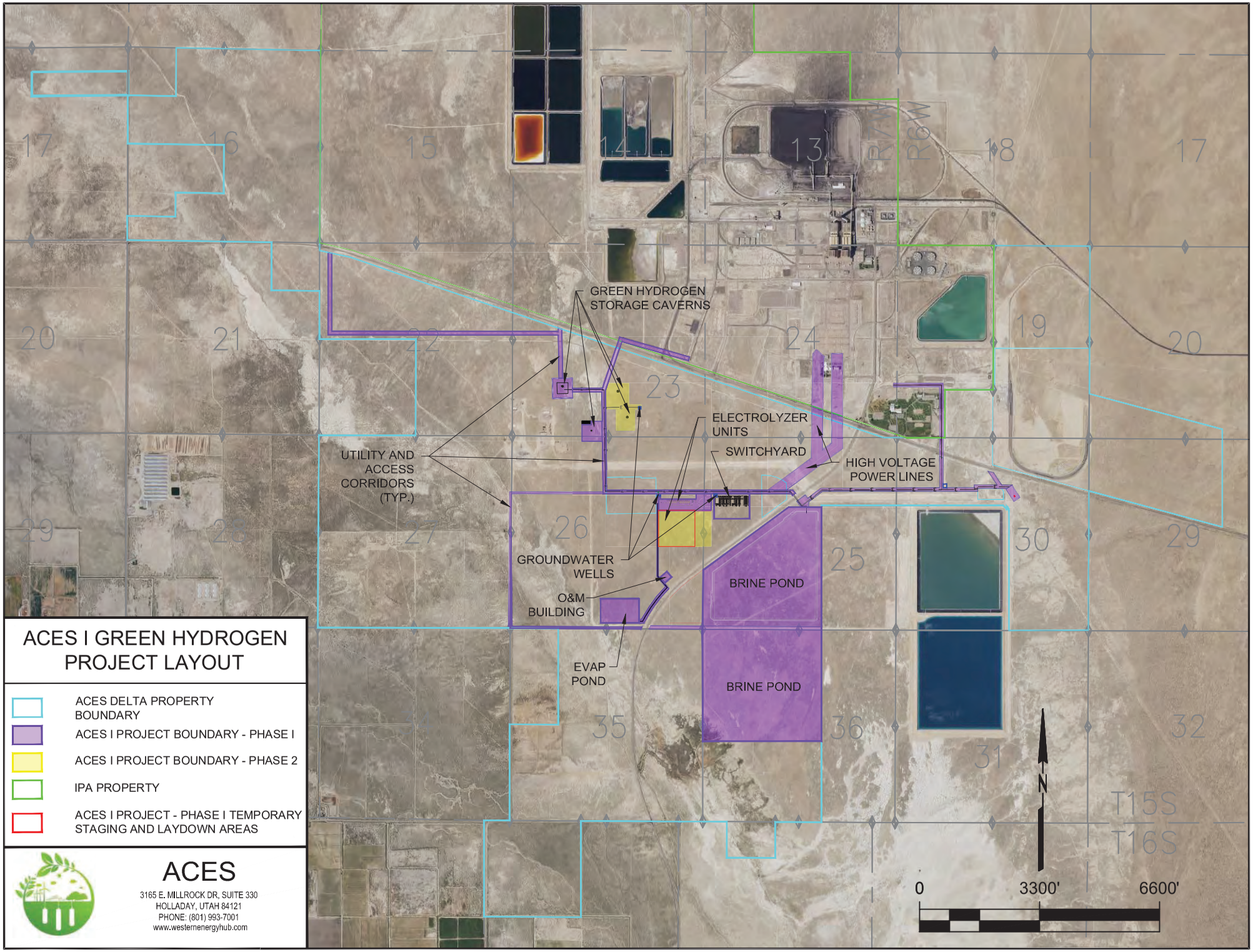

NORTH

STATE OF UTAH




ACES
3165 E. MILLROCK DR, SUITE 330
HOLLADAY, UTAH 84121
PHONE: (801) 993-7001
www.westernenergyhub.com

**Attachment 2**
**Site Layout Figure**

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**Attachment 3**
**ACES I Project – Map of Cultural Resources Surveys (Confidential) with Area of Potential Effects**

**Attachment Redacted due to Sensitive Information**

**Attachment 4**
**Citations of Cultural Inventory Reports**

The following citations are for each survey depicted on ACES I Project – Map of Cultural Resources Surveys (Confidential). All but the 2021 Baxter, J. and Jordan, A. survey have been previously submitted to SITLA and SHPO.


- James, T.A., L. McNees, D.M Reale, Z. Nelson, M. Peterson, C. Smith, and B. Hill. 2010. Class III Cultural Resources Inventory for the Magnum Gas Storage Project, Millard, Juab, and Utah Counties, Utah. (Entrix, Inc., November 2009, revised April 2010.)
- McNees, L. 2010. Letter dated October 29, 2010, to Lori Hunsaker, Utah Deputy State Historic Preservation Officer, describing IMACS site forms for 21 previously unrecorded sites in Juab County, Utah. (Cardno Entrix. October 29, 2010.)
- Hamilton, J., and T.A. James. 2012. Class III Cultural Resources Inventory for the Magnum Gas Storage Project, Millard, Juab and Utah Counties, Utah. (Magnum, 2012.)
- Smith, C., and L. McNees. 2014. A Class III Cultural Resource Inventory for Magnum NGLs LLC's Proposed Brine Storage Pond, Millard County, Utah. (EcoLogic Environmental Consultants, LLC, December 2014.)
- Cunningham, S.H. 2015. Class III Cultural Resources Inventory of 184 Acres for Magnum Holdings, LLC Millard County, Utah. (Desert West Environmental, LLC, December 2015.)
- Cunningham, S.H. 2016. Treatment Plan Addendum for the Magnum NGLs Brine Storage Pond Project (Pond 2) and the Associated Mitigation Report. (Desert West Environmental, LLC, February 2016).
- Bassett, E. 2016. Cultural Resources Inventory Report, Magnum Energy Hub, Millard County, Utah. (Transcon Environmental, Inc., September 2016.)
- Baxter, J. and Jordan, A. 2021. A Cultural Resource Inventory for the ACES I Project Brine Pond 6 Area, Millard County Utah. (Bighorn Archaeological Consultants, LLC, July 2021.)

**Attachment 5**
**A 2021 Supplemental Cultural Resources Inventory for the Previously Unsurveyed ACES I Projects Brine Pond 6 Area**

**Attachment Redacted due to Sensitive Information**

Spencer J. Cox
*Governor*

Deidre M. Henderson
*Lieutenant Governor*

Jill Remington Love
*Executive Director*
*Utah Department of Cultural and Community Engagement*

Utah Division of State History

Jennifer Ortiz
*Director*

Christopher Merritt
*State Historic Preservation Officer*

January 31, 2022

Todd Stribley
NEPA Documents Manager, Loans Program Office
U.S. Department of Energy
Washington, D.C.

RE: ACES I Project (Original Magnum Gas Storage Project) (U21HO0563)

For future correspondence, please reference Case No. 22-0156

Dear Mr. Stribley,

The Utah State Historic Preservation Office received your submission and request for our comment on the above-referenced undertaking on January 31, 2022.

We concur with your determination of "No Adverse Effect" for this undertaking assuming that the stipulations relating to 42MD 3308 outlined in your consultation request letter will be followed.

This letter serves as our comment on the determinations you have made within the consultation process specified in §36CFR800.4. If you have questions, please contact me at 801-245-7246 or by email at sagardy@utah.gov.

Sincerely,

Savanna Agardy
Compliance Archaeologist

Consultation with the Utah Office of the Governor, Public Lands Policy Coordinating Office, and other Utah State Offices

**Department of Energy**
Washington, DC 20585

December 9, 2021

Ms. Sindy Smith, RDCC Coordinator
Office of the Governor, Public Lands Policy Coordinating Office
5110 State Office Building
Salt Lake City, UT 84114-1107

**SUBJECT:** The U.S. Department of Energy's (DOE's) intent to Prepare an Environmental Assessment (EA) for a proposed Federal Loan Guarantee to ACES I, LLC., for a Green Hydrogen Production and Storage Facility in Delta, Millard County, Utah

Dear Ms. Smith:

Title XVII of the Energy Policy Act of 2005 (EPAct) established a Federal loan guarantee program for certain projects that employ innovative technologies and authorizes the Secretary of Energy to make loan guarantees available for those projects. ACES I, LLC (ACES) has applied for a loan guarantee pursuant to the U.S. DOE's Renewable Energy and Efficient Energy Projects Solicitation (Solicitation Number: DE-SOL-0007154) under Title XVII, Innovative Energy Loan Guarantee Program, authorized by EPAct, (REEE Projects). DOE is evaluating whether to provide a Federal loan guarantee to ACES to support the development of the proposed ACES I Project (Project) in Delta, Utah. The decision to prepare an EA for the Project was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

The purpose and need for agency action is to comply with the DOE mandate under Title XVII of the EPAct to select projects for loan guarantees that are consistent with the goals of the Act. The DOE Loan Programs Office (LPO) has determined that the Project as proposed by ACES is eligible pursuant to Section 1703 of EPAct and that it complies with DOE's mandate as defined in the Act (DOE's purpose and need). DOE is using the NEPA process to assist in determining whether to issue a loan guarantee to ACES to support the development of the Project. A goal of DOE's financial assistance for REEE Projects is to support the construction and startup of projects and facilities located in the United States that employ that employ innovative and renewable or efficient energy technologies that avoid, reduce, or sequester anthropogenic emission of greenhouse gases.

The proposed Project is a green hydrogen production and long-duration storage facility being developed approximately 10 miles north of Delta, Utah (see enclosed Site Location Map and Site Layout Map for the Project). The Project is directly adjacent to the Intermountain Power Agency's Intermountain Power Plant (IPP) that is being re-powered from coal-fired to natural gas and green hydrogen-fired. Once operational, the facility will provide a carbon free green hydrogen fuel source for energy generation, industrial, and transportation industries region-wide. The Project is expected to be constructed in two phases, with the first phase anticipated to begin in 2022 and beginning operations in 2024. Construction of the second phase will be timed after the first phase has been constructed and as the demand for green hydrogen fuel increases. Based on preliminary estimates, up to 500 jobs would be created during construction, and up to 50 jobs for facility operation. The enclosed Site Layout depicts the Project Area and proposed Project facilities that include:

- Four below ground salt storage caverns constructed using solution mining technology to store green hydrogen (two constructed during each construction phase);
- Ventilated shelters to house up to 550 MW of industrial electrolyzer units for the production of green hydrogen (220 MW installed during phase 1, and 330 MW installed during phase 2);
- Electolyzer support facilities to include pumping systems, a cooling tower and detention pond for the electrolyzer units;
- Groundwater production wells and two brine evaporation ponds and associated shallow groundwater monitoring wells to support the solution mining of caverns and general operation and monitoring activities;
- Utilities including water, brine and storage product distribution pipelines, site distribution and high-voltage power lines, and microwave, digital and/or cellular communication lines, towers and equipment;
- An operations and maintenance office building, warehouse, and storage areas, well pads, and associated new gravel access roads; and,
- Four temporary laydown and staging areas to be used during construction that are located adjacent to the proposed cavern pads, electrolyzer units, brine evaporation ponds and substation respectively.

At this time, ACES has completed environmental resources studies to support the development of the EA. In addition, ACES has obtained key state and local permits for the construction and operation of the proposed Project. The main contacts for the issued permits have received a copy of this letter and are listed below.

The DOE NEPA regulations provide for the notification of host states of NEPA determinations and for the opportunity for host states to review EAs prior to DOE approval. This process is intended to improve coordination and to facilitate early and

open communication. DOE will provide the draft EA to you for your review and comment.

If you or your staff would like to receive further information concerning this project or DOE's NEPA process, please contact me in the DOE Loan Programs Office at 303-275-4549, or email at Todd.Stribley@hq.doe.gov.

Sincerely,

Todd Stribley

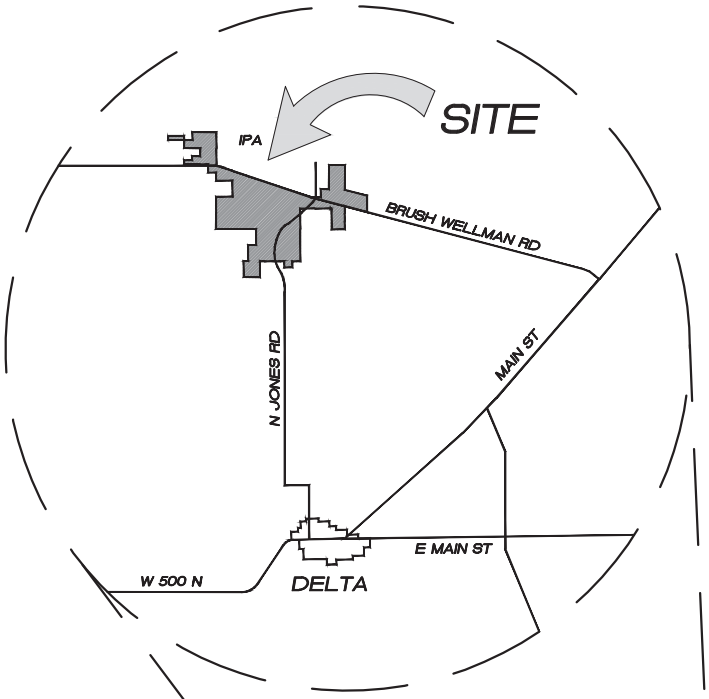
Todd Stribley
NEPA Document Manager
Loan Programs Office

Enclosures:

Site Location Map
Site Layout Map

Cc:
Dan Hall, Division of Water Quality (DWQ), Groundwater Protection Unit (GPU) Manager
Brian Hamos, DWQ, DPU Groundwater Discharge Permit Manager
Drummond Early, DWQ, DPU Class III Underground Injection Control Permit Manager
Everette Taylor, Division of Water Rights (DWRi), Dam Safety, Assistant Utah State Engineer
Bret Dixon, DWRi Dam Safety Permit Manager
Alan Humphries, Division of Air Quality, Minor New Source Review Program Manager
Adam Richins, Millard County Planner and Building Official

# ACES I GREEN HYDROGEN PROJECT LOCATION

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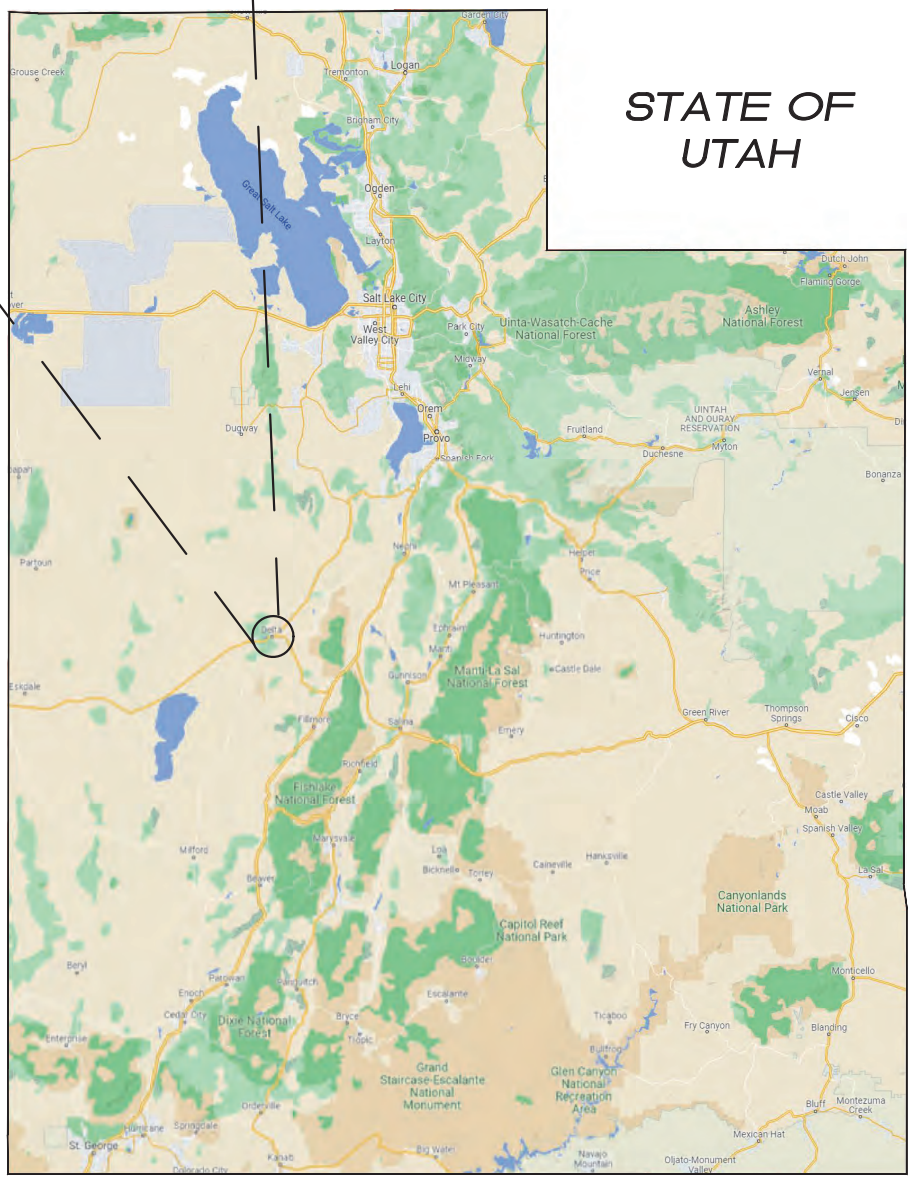
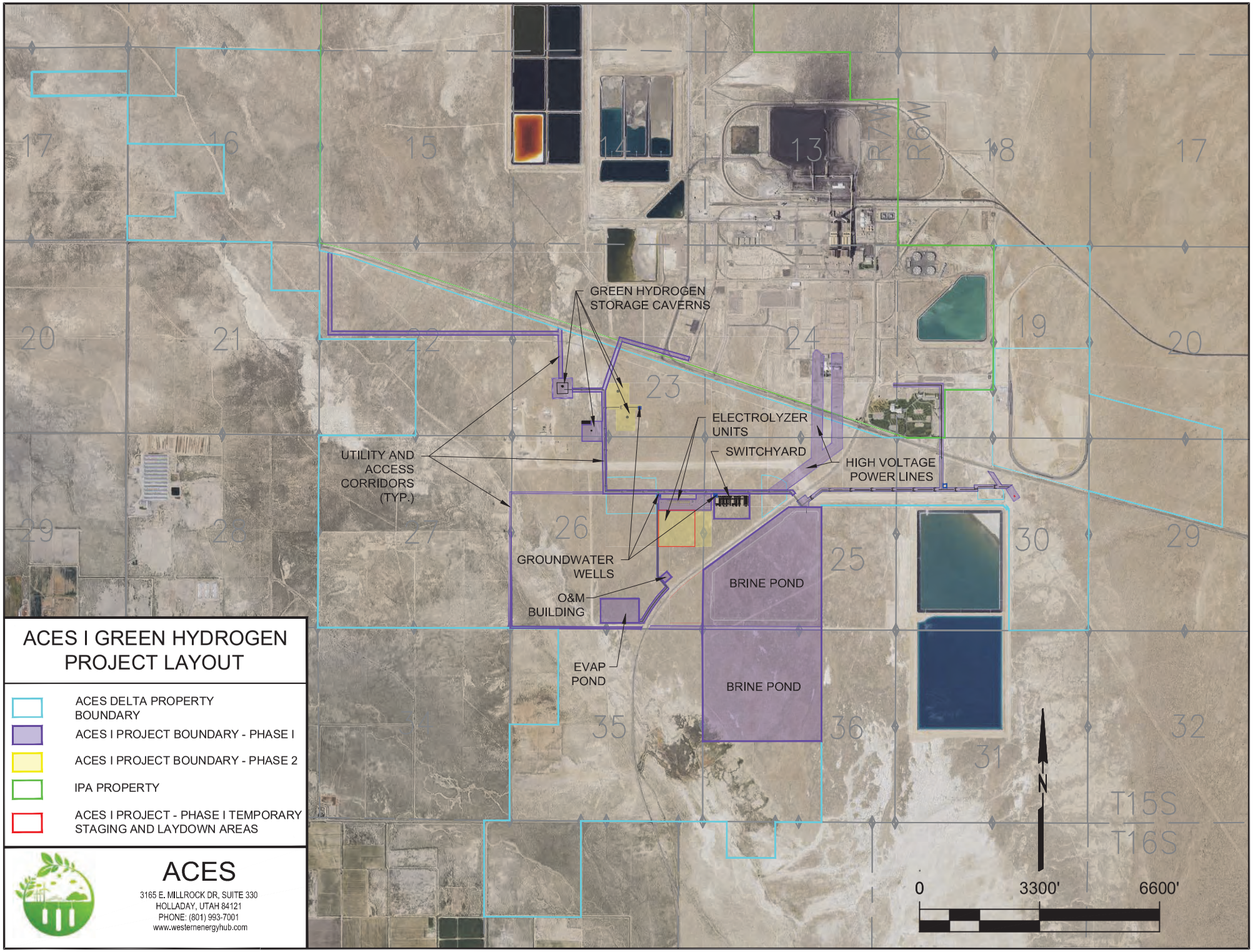
STATE OF UTAH




ACES
3165 E. MILLROCK DR, SUITE 330
HOLLADAY, UTAH 84121
PHONE: (801) 993-7001
www.westernenergyhub.com

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State of Utah

SPENCER J. COX
*Governor*

DEIDRE M. HENDERSON
*Lieutenant Governor*

Office of the Governor
Public Lands Policy Coordinating Office

REDGE B. JOHNSON
*Executive Director*

April 18, 2022

*Submitted via electronically: DOE_LPO@icf.com*

Todd Stribley
NEPA Document Manager
U. S. Department of Energy LP 10
Loan Programs Office
1000 Independence Avenue, SW
Washington D.C. 20585

Subject: **Advanced Clean Energy Storage Project EA**

Dear Mr. Stribley:

The state of Utah (State) has reviewed the Department of Energy's Environmental Assessment for the Advanced Clean Energy Storage Project (Project). The State supports the Applicant's proposal to produce hydrogen from water using primarily renewable energy sources and store it in four new caverns solution mined within a large salt formation underlying the Project site, which is located near Delta, Utah.

The Applicant's objective is to provide hydrogen to the adjacent Intermountain Power Plant (IPP) as part of its Hydrogen Supply Project. The Intermountain Power Agency (IPA), which owns IPP, is a group of public utilities that supply power to municipalities in California, Utah, Wyoming, Colorado, and Arizona. In the near term, IPP is planning to replace its existing coal-fired electric generation units with new natural gas–fired electric generation units. The Applicant's hydrogen will be used for long-term seasonal storage and will be blended with natural gas to reduce the IPP facility's carbon footprint. The Applicant's hydrogen will be used by IPP beginning at commissioning in 2025 for a fuel mixture of 30 percent hydrogen and 70 percent natural gas, moving to 100 percent hydrogen by 2045.

IPP's use of hydrogen produced and stored by the Applicant will reduce criteria air pollutant emissions such as ozone precursors and particulate matter and will reduce emissions of GHGs that contribute to global climate change, as is consistent with the primary

goal of the Title XVII Program. Bringing hydrogen to market and into greater use, would reduce overall national emissions of air pollutants and human caused GHGs.

The Applicant, Advanced Clean Energy Storage, (ACES), a wholly owned subsidiary of ACES Delta, LLC, collectively referred to as ACES. ACES is a joint initiative of Magnum Development (Magnum), Mitsubishi Power, and Haddington Ventures. The Applicant and Magnum collectively control the only known domal-style salt geologic structure (salt dome) in the Western U.S., encompassing approximately 4,810 acres directly adjacent to the IPP near Delta, Utah. The salt dome is large enough to support more than 70 caverns, each of which could store up to 5,500 metric tonnes of hydrogen. The Applicant has spent the past 3 years (2020, 2021, 2022) obtaining the necessary state and local permits and approvals for the Project, as well as preparing Project design and cost estimate. The Project will safely and cost-effectively produce and store hydrogen in four solution mined storage caverns to support the integration of variable/excess renewable energy from the electric grid and the conversion of the IPP from coal to hydrogen gas fuel.

The State, in collaboration with the Utah Division of Wildlife Resources (DWR), submits the following comments for your consideration.

On March 21, 2022, the State officially adopted a hydrogen component within the Energy section of the State of Utah Resource Management Plan[1] along with the following State policies.

- Support the research and development of hydrogen production and capture infrastructure.
- The State prefers that hydrogen production be accomplished through processes that do not require the excessive consumption of water resources.

The State supports the Finding of No Significant Impact (FONSI). The Project fulfills both of the policy statements.

First, the Project advances the research and development of hydrogen production and capture infrastructure in Utah to reduce emissions and improve the reliability of the energy grid.

Second, the State prefers that hydrogen production be accomplished through processes that do not require excessive consumption of water resources. This project will use thousands of acre-feet of water per year for construction and operations. However, the long-term Project utilization of water resources will be reduced from current levels.

[1] https://storymaps.arcgis.com/collections/81d4406668e34acca4d98275ee41cd07?item=8

As stated on pages 21-23 of the EA:

> "The project is located in the Sevier Desert River Basin and Intermountain Power Agency (IPA) has 45,000 acre-feet of surface water and groundwater rights for use annually and will deliver water to the Project via the existing IPP surface water and groundwater delivery system."

> "Potential impacts on water quantity would include the temporary use of surface water to construct Project facilities and the long-term use of groundwater to support operations."

> "The current annual 12,500 acre-feet water use by the IPP would be reduced to approximately 6,500 acre-feet from using hydrogen fuel, as compared to coal-fired operation. In addition, the summary shows that even a combined total of water use by the IPP and the Project during operations would be a significant reduction."

**Utah Division of Wildlife Resources**

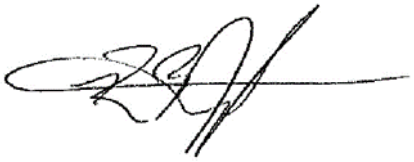
The DWR appreciates management measures for kit fox. DWR recommends avoiding construction during pup-rearing from February 1 to July 30. If burrows need to be collapsed, DWR suggests that occur between August 1 to December 31. DWR would appreciate project proponents sharing pre-construction burrowing owl and kit fox survey results upon completion, allowing DWR to keep its occurrence records updated with the most recent information.

Additionally, the project area is within a mule deer migration corridor. DWR recommends placing eight-foot-high exclusionary perimeter fencing to keep big game out of the property and ponds. If you have questions, please contact the DWR's Impact Analysis Biologist in DWR's Cedar City office, Jessica Kinross, at jessicavan@utah.gov or 435-691-2372.

The State will continue to work with private industry, government entities, and other stakeholders to ensure that energy being produced in Utah is reliable, durable, and affordable for Utahns and other customers. These and similar efforts to convert to systems that use less water and have significantly reduced emissions is commendable and speaks to the importance of being innovative and timely in ensuring our energy independence.

Thank you for your consideration of the State's comments. Please direct any written correspondence to the Public Lands Policy Coordinating Office at the address below or call to discuss any questions or concerns.

Sincerely,



Redge B. Johnson
Executive Director

Department of Energy
Washington, DC 20585

April 25, 2022

*Submitted electronically: sindysmith@utah.gov*

Mr. Redge Johnson, Executive Director
Public Lands Policy Coordinating Office
State of Utah

**SUBJECT:** Response to State of Utah - U.S. Department of Energy, Proposed Federal loan guarantee to Advanced Clean Energy Storage I, LLC (ACES I, LLC) for an Advanced Clean Energy Storage (ACES) Project near Delta, Utah

Dear Mr. Johnson,

Thank you for letter dated April 18, 2022. Your letter was in response to the U.S. Department of Energy (DOE), Loan Programs Office (LPO) Environmental Assessment (EA) regarding a Federal loan guarantee to ACES I, LLC. (ACES), for the development of a renewable energy project that will produce and store hydrogen near Delta, Utah (DOE's proposed action and undertaking).

We appreciate your review of the EA and support of LPO's Finding of No Significant Impact. In addition, LPO has reviewed the wildlife measures (e.g. surveys, monitoring, reporting, and exclusion fencing) that were identified by the Utah Division of Wildlife Resources as well as the information provided by ACES to the Division of Wildlife Resources on April 22, 2022 (see attached letter). LPO has incorporated the additional information and measures (pre-construction surveys and results) into the EA.

If you have any questions, please contact me at DOE_LPO@icf.com.

Sincerely,

Todd Stribley

Todd Stribley
NEPA Document Manager
Loan Programs Office

Attachment:
April 22, 2022 letter from ACES to UDWR

State of Utah
School and Institutional
Trust Lands Administration

675 East 500 South, Suite 500
Salt Lake City, Utah 84102-2813
801-538-5100 Fax 801-355-0922
trustlands.utah.gov

Michelle McConkie
Director

April 18, 2022

Todd Stribley
NEPA Document Manager
Director, Environmental Compliance
DOE Loan Programs Office
Via email to: todd.stribley@hq.doe.gov

Subject: **ACES 1 LLC, Draft Environmental Assessment**

Dear Mr. Stribley:

I am pleased to submit this letter of support for the Advanced Clean Energy Storage Project (ACES 1, LLC), located at the School and Institutional Trust Land Administrations IPP Block north of Delta, Utah. Magnum and the ACES team have been long-term lessees at this site (since January of 2009) and have spent millions of dollars researching, mapping, and testing the technologies that will be used to create and store green hydrogen in the underground salt caverns. SITLA will receive a percentage of the revenue generated from this project to advance its mission of supporting the Permanent School Trust for the children in Utah.

As the landowner and lessor to the project, we have reviewed the documentation submitted to the DOE Loan program and have been involved with our lessee (ACES 1) to ensure compliance with SITLA's environmental and specific lease requirements. We have found no concerns with the project and are fully supportive of the project moving ahead.

If you have additional questions, please contact the project manager for the ACES Project, Troy Herold, at (801) 538-8170 or therold@utah.gov.

Sincerely,

Michelle E. McConkie

Michelle McConkie
Director

CC: Troy Herold
File

# American Indians, Indian Tribes, and Alaska Natives Consultations

| Entity | Contact(s) |
|---|---|
| Confederated Tribes of the Goshute | Mr. Rupert Steele, Chairman |
| Hopi Tribe | Mr. Timothy Nuyangyaoma, Chairman<br>Mr. Stewart Koyiyumptewa, Tribal Historic Preservation Officer |
| Kaibab Band of Paiute Indians | Ms. Ona Segundo, Chairperson<br>Mr. Daniel Bulletts, Environmental Director |
| Navajo Nation | Mr. Jonathan Nez, President<br>Mr. Richard Begay, Tribal Historic Preservation Officer |
| Paiute Indian Tribe of Utah | Ms. Corrina Bow, Chairperson<br>Ms. Dorena Martineau, Cultural Resources Director |
| Paiute Indian Tribe of Utah – Indian Peaks Band | Ms. Tamra Borchardt-Slayton, Chairperson |
| Paiute Indian Tribe of Utah – Kanosh Band | Ms. Darlene Arrum, Chairperson |
| Paiute Indian Tribe of Utah – Cedar Band | Mr. Tom Delice, Chairperson |
| Paiute Indian Tribe of Utah – Shivwits Band | Ms. Hope Silvas, Chairperson |
| Paiute Indian Tribe of Utah – Koosharem Band | Ms. Toni Kanosh, Chairperson |
| Skull Valley Band of Goshute | Ms. Candace Bear, Chairperson |
| Ute Indian Tribe | Mr. Shaun Chapoose, Chairman<br>Ms. Betsy Chapoose, NAGPRA Representative |

Note:
An individual letter was submitted to each Indian Tribe on December 9, 2021. To reduce the file size and the overall number of pages, the letter to the Ute Indian Tribe is included as an example, and all responses received are included.

**Department of Energy**
Washington, DC 20585

December 9, 2021

Mr. Shaun Chapoose, Chairman
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026-0190

**SUBJECT:** Proposed Federal Loan Guarantee to ACES I Project in Delta, Millard County, Utah

Dear Chairperson Chapoose:

The U.S. Department of Energy (DOE) is preparing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to assist in determining whether to issue a Federal loan guarantee to ACES I, LLC (ACES) for the ACES I Project (Project) in Delta, Millard County, Utah (see enclosed Site Location and Site Layout Figures). As part of this environmental review process, DOE is also conducting a historic resource review in compliance with Section 106 of the National Historic Preservation Act (NHPA).

The proposed Project is a green hydrogen production and long-duration storage facility being developed approximately 10 miles north of Delta, Utah. The Project is directly adjacent to the Intermountain Power Agency's Intermountain Power Plant (IPP) that is being re-powered from coal-fired to natural gas and green hydrogen-fired. Once operational, the facility will provide a carbon free green hydrogen fuel source for energy generation, industrial, and transportation industries region-wide. The Project is expected to be constructed in two phases, with the first phase anticipated to begin in 2022 and beginning operations in 2024. Construction of the second phase will be timed after the first phase has been constructed and as the demand for green hydrogen fuel increases. Based on preliminary estimates, up to 500 jobs would be created during construction, and up to 50 jobs for facility operation. The enclosed Site Layout depicts the Project Area and proposed Project facilities that include:

- Four below ground salt storage caverns constructed using solution mining technology to store green hydrogen (two constructed during each construction phase);
- Ventilated shelters to house up to 550 MW of industrial electrolyzer units for the production of green hydrogen (220 MW installed during phase 1, and 330 MW installed during phase 2);
- Electolyzer support facilities to include pumping systems, a cooling tower and detention pond for the electrolyzer units;
- Groundwater production wells and two brine evaporation ponds and associated shallow groundwater monitoring wells to support the solution mining of caverns and general operation and monitoring activities;

- Utilities including water, brine and storage product distribution pipelines, site distribution and high-voltage power lines, and microwave, digital and/or cellular communication lines, towers and equipment;
- An operations and maintenance office building, warehouse, and storage areas, well pads, and associated new gravel access roads; and,
- Four temporary laydown and staging areas to be used during construction that are located adjacent to the proposed cavern pads, electrolyzer units, brine evaporation ponds and substation respectively.

This letter is intended to notify you of the proposed Federal project (a potential loan to ACES), identify if you have an interest in the proposed project site, and provide you with the opportunity to comment and engage DOE in government-to-government consultation on the proposed project in Delta, Utah. Any comments or concerns you provide will help ensure that DOE considers Tribal interests and complies with its NEPA and NHPA Section 106 responsibilities. We want to give you the opportunity to raise any issues or concerns you may have regarding the site.

I would greatly appreciate notification if you do or do not have an interest in the project site, as well as any comments or concerns you may have by [30 days from mail out], 2021. Should you have an interest in the project site, I will provide you with additional information pursuant to NEPA and the NHPA as it becomes available. Please provide your notification of interest and any comments or concerns by email at Todd.Stribley@hq.doe.gov, or I can also be reached by telephone at 303-275-4549.

Respectfully,

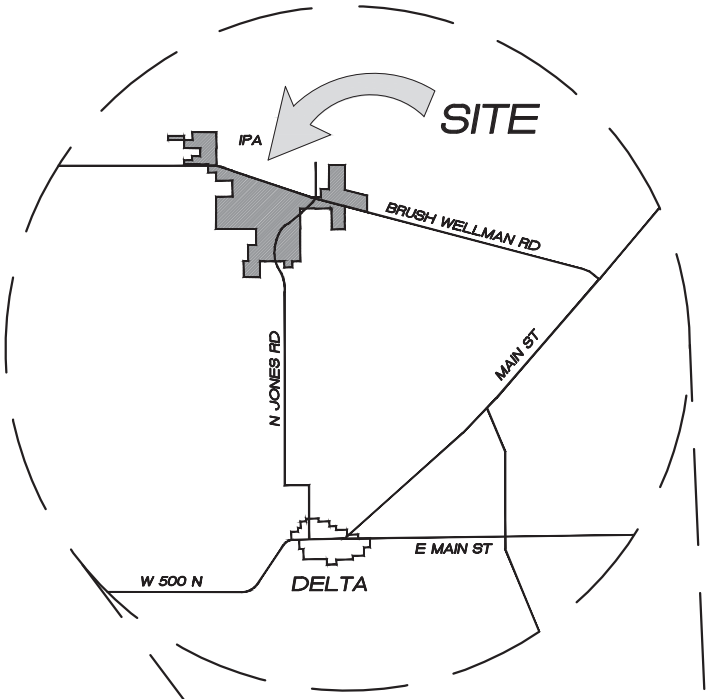
Todd Stribley

Todd Stribley
NEPA Document Manager
Loan Programs Office

Attachments:

Site Location Map
Site Layout Figure

# ACES I GREEN HYDROGEN PROJECT LOCATION

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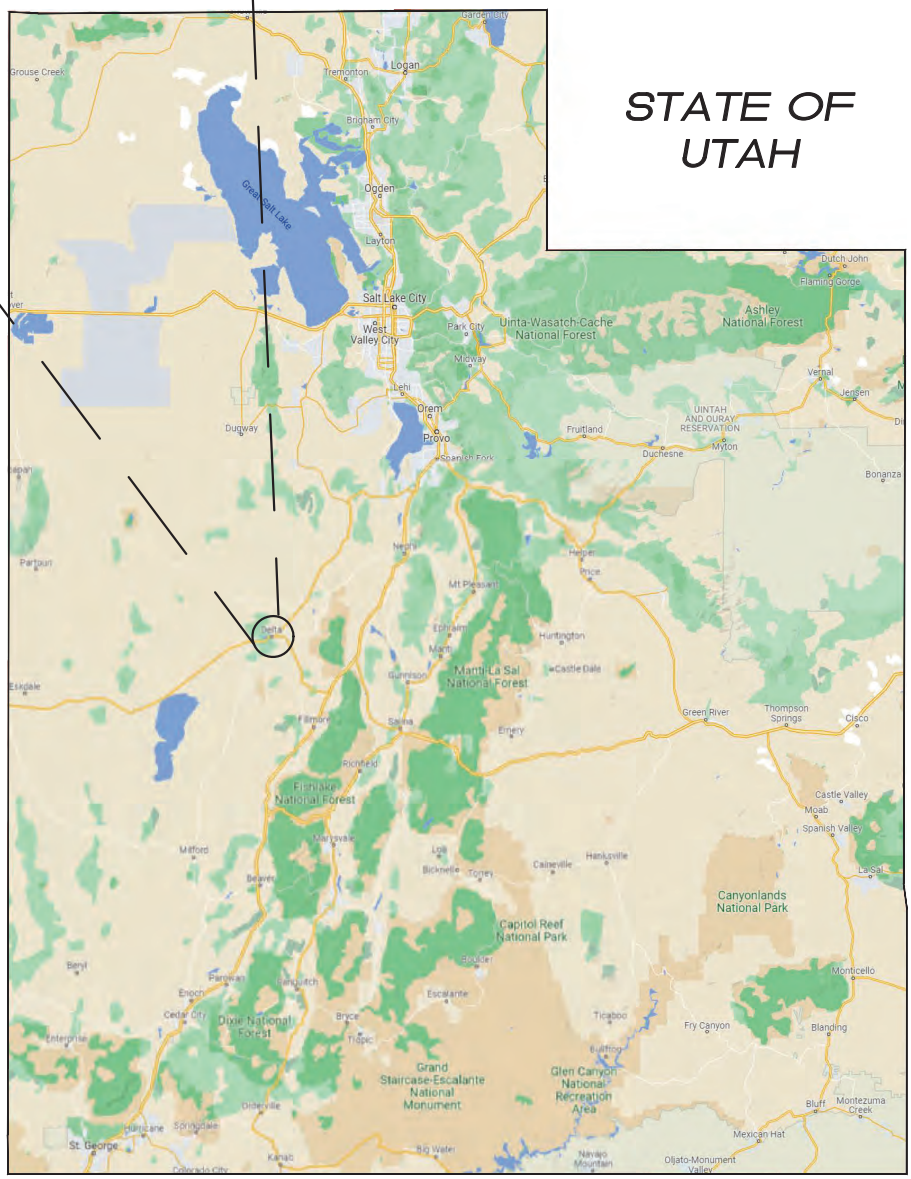
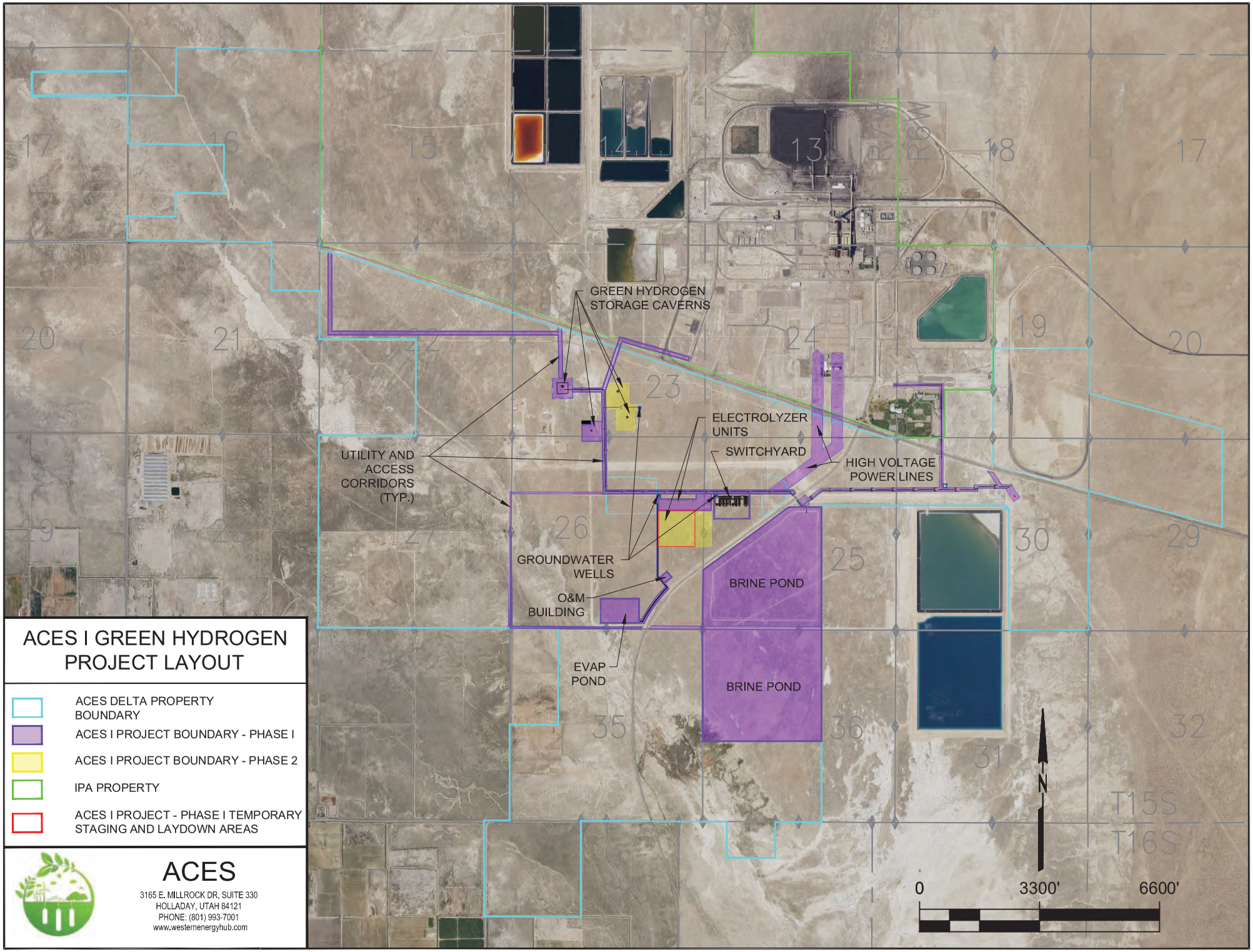



ACES
3165 E. MILLROCK DR, SUITE 330
HOLLADAY, UTAH 84121
PHONE: (801) 993-7001
www.westernenergyhub.com

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| | |
|---|---|
| **From:** | Daniel Bulletts |
| **To:** | Stribley, Todd |
| **Subject:** | [EXTERNAL] Re: [Take care when opening attachments] U.S. Department of Energy - Federal Action in Delta, UT |
| **Date:** | Friday, December 10, 2021 1:55:02 PM |

Hello,
The Kaibab Band of Paiute Indians Cultural Resource department does not have any questions or comments regarding this project.

Thank you,

On Thu, Dec 9, 2021 at 3:02 PM Stribley, Todd <todd.stribley@hq.doe.gov> wrote:

> Dear Chairperson Segundo and Director Bulletts:
>
> The U.S. Department of Energy (DOE) is preparing an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to assist in determining whether to issue a Federal loan to ACES I, LLC to support the development of a green hydrogen production and long-duration storage facility in Delta, Millard County, Utah. As part of this environmental review process, DOE is also conducting a historic resource review in compliance with Section 106 of the National Historic Preservation Act (NHPA).
>
> Attached to this email is the formal notification letter that contains additional information and figures.
>
> Please let me know if you have any issues accessing the PDF version of the letter.
>
> Respectfully,
>
> **Todd Stribley**
>
> **Loan Programs Office**
>
> Office: 303.275.4549
>
> Cell: 301.525.5944
>
> Todd.Stribley@hq.doe.gov

--
Daniel Bulletts
Southern Paiute Consortium/Cultural Resource Director
Kaibab Band of Paiute Indians
HC 65 Box 02
Fredonia AZ 86022

**From:** Richard M. Begay <r.begay@navajo-nsn.gov>
**Sent:** Saturday, March 19, 2022 2:42 PM
**To:** DOE LPO Environmental <DOE_LPO@icf.com>
**Subject:** RE: ACES Draft Environmental Assessment

I reviewed the attached documents and have no comments or concerns. Please proceed without further consultation with the Navajo Nation.
Richard M. Begay, THPO
Navajo Nation

**From:** DOE LPO Environmental <DOE_LPO@icf.com>
**Sent:** Friday, March 18, 2022 11:04 AM
**To:** Jonathan Nez <jonathannez@navajo-nsn.gov>
**Cc:** Richard M. Begay <r.begay@navajo-nsn.gov>
**Subject:** ACES Draft Environmental Assessment

Dear President Nez,

The U.S. Department of Energy (DOE), Loan Programs Office (LPO) prepared an Environmental Assessment (EA) pursuant to the National Environmental Policy Act (NEPA) to consider the environmental impacts of its decision whether or not to provide a Federal loan guarantee to ACES I, LLC., for the development of a renewable energy project that will produce and store hydrogen near Delta, Utah (DOE's proposed action and undertaking). The decision to prepare an EA was made in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR Part 1021).

DOE's Loan Programs Office (LPO) provides loan and loan guarantee authority under three loan programs – the Innovative Energy Loan Guarantee Program (Title 17), the Advanced Technology Vehicles Manufacturing (ATVM) loan program, and the Tribal Energy Loan Guarantee Program. The primary goal of DOE's Title 17 Renewable Energy/Efficient Energy is to finance projects and facilities located in the United States that employ innovative and renewable or efficient energy technologies that avoid, reduce, or sequester anthropogenic emission of greenhouse gases. The ACES Project will safely and cost-effectively produce and store hydrogen in up to four solution-mined storage caverns to support the integration of variable/excess renewable energy from the electric grid and the conversion of the adjacent Intermountain Power Plant (IPP) from coal to hydrogen gas fuel.

As an interested party and in accordance with DOE NEPA regulations, the EA and draft Finding of No Significant Impact (FONSI) is included as an attachment to this email for your review.

**Please review and provide any comments you may have to DOE_LPO@icf.com by April 18, 2022.**

Sincerely,

Todd Stribley
NEPA Document Manager
Loan Programs Office

# APPENDIX C ENVIRONMENTAL COMPLIANCE MEASURES

# ENVIRONMENTAL COMPLIANCE MEASURES SUMMARY

The Project has established the following environmental compliance measures for construction and operations. These measures include both resource specific plans approved by the jurisdictional state agency and Applicant committed measures. The approved plans and measures were developed in cooperation with federal, state and local agencies to avoid or minimize potential Project-related impacts on social and environmental resources and protect worker and public safety. All Project employees, contractors and consultants will be required to complete training on these measures prior to beginning work and will be required to retrain periodically.

## Pre-Construction Measures

Pre-construction measures recommended by Utah Division of Wildlife Resources (UDWR) have been either completed or established to minimize impacts to the identified wildlife resources burrowing owl, kit fox, and mule deer. ACES I LLC acknowledged UDWR comments and confirmed that recommended measures have been completed or established in a letter to UDWR dated April 22, 2022 (ACES I LLC 2022).[8]

The following pre-construction activities have been completed and recommended measures incorporated into the standard operations plan for the Project:

- Burrow survey and collapse activities were conducted between February 28 and March 1, 2022 in conjunction with vegetation mowing in construction areas, and a 100-foot buffer was established to minimize potential impacts to kit fox, burrowing owls and other migratory birds to conform to seasonal restrictions recommended by SITLA and UDWR and to maintain compliance with the Migratory Bird Treaty Act.

- Raptor stick nest surveys were conducted on March 1, March 28, and April 11, 2022 to minimize potential impacts to nesting raptors in accordance with SITLA and UDWR recommendations and to maintain compliance with the Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act.

- ACES has incorporated 8-foot-high exclusionary fences around the perimeter of Project facilities to keep big game out of the property and ponds.

ACES will continue to provide copies of future reports during construction that result from the monitoring activities associated with the wildlife commitments.

## Construction Measures

The EPC/EPCM QMP will be responsible for implementing the Project training and management of the construction related compliance measures during construction. In addition, during construction the EPCM will be responsible for ongoing monitoring of compliance with the measures and for completing routine and immediate reporting required by the federal, state and local permit, authorization and regulatory requirements. Reporting will include providing weekly and monthly reports as well as immediate reporting of an observed violation of the compliance measures or interim reporting of an incident that requires a report to be filed in accordance with the SWPPP, SPCC Plan or other permit requirements.

A summary of the plans and measures that will be implemented during construction include:

- Cultural Resources Unanticipated Discovery Plan;
- Fugitive Dust Control Measures;

[8] ACES I LLC 2022. Letter to Ms. Jessica Kinross, Impact Analysis Biologist, State of Utah Department of Natural Resources. Division of Wildlife Resources from Mr. John Alvarado, Chief Financial Officer, ACES I, LLC, April 22, 2022.

- Reclamation and Weed Management Measures;
- Storm Water Pollution Prevention Plan (SWPPP);
- Spill Prevention Control and Countermeasures (SPCC) Plan;
- Wildlife Management Measures; and
- Wildfire Management Measures.

## *Cultural Resources Unanticipated Discovery Plan*

The purpose of the Unanticipated Discovery Plan is to provide general guidelines to ensure the Applicant maintains full and complete compliance with all federal and state regulations concerning the protection of cultural resources and human skeletal remains in the event that unanticipated cultural resources are encountered during construction Facility. Guidance is provided for:

- definition of unanticipated discovery;
- categories of unanticipated discoveries;
- treatment of unanticipated discoveries; and
- treatment of human remains.

## *Fugitive Dust Control Measures*

To minimize erosion and dust, the construction contractor will follow best practices such as:

- park and conduct ground-disturbing activities only within designated areas;
- install, maintain, and inspect erosion control devices (ECDs) in accordance with the SWPPP;
- limit vehicle speeds within construction site to 15 miles per hour (mph);
- apply water to graded surfaces as needed to minimize dust; and,
- inspect and clean track-in/track-out areas daily.

## *Reclamation and Weed Management Measures*

To prevent and control the spread of noxious weed species, the construction contractor will follow best practices such as:

- all Project access and construction activities will be completed within the designated areas,
- clean and inspect all vehicles upon arrival at Facility prior to approving for use;
- if seed, hay, straw, or mulch is used during construction, only allow certified weed-free products; and,
- stabilize, reclaim, and/or reseed any disturbed areas in accordance with the SWPPP and/or contract reclamation requirements

## *Storm Water Pollution Prevention Plan*

The purpose of the SWPPP is to provide general guidelines to identify reasonably expected sources of pollution that may affect the quality of storm water discharges from the construction site. Guidance is provided for:

- identification of potential sources of pollution;
- erosion and sediment control measures;
- housekeeping measures; and
- post-construction stabilization.

## Spill Prevention Control and Countermeasures Plan

The purpose of the SPCC Plan (is to provide general guidelines that outline procedures for the spill prevention and containment of hazardous materials. A site-specific SPCC Plan will be developed and provided by the construction contractor. Guidance is provided for:

- storage and transfer of hazardous materials;
- spill prevention measures and controls;
- storage inspections and personnel training; and
- requirements for reporting certain spills.

## Wildlife Management Measures

No USFWS-listed species or designated critical habitat are known to occur within the Project site. Low-quality habitat suitable for the kit fox and burrowing owl, UDWR SGCN designated species, does exist in the Project site. Habitat to support migratory birds occurs within the entire Project site. To minimize impacts on wildlife the Project will follow the following measures:

### Kit Fox

Low-quality kit fox habitat occurs within the Project. The following UDWR approved measures will be used within kit fox habitat in accordance with the SITLA lease requirements:

- Conduct a preconstruction survey to identify active kit fox dens, and/or;
- Mow vegetation or collapse dens outside breeding, nesting, and young rearing periods (September 1 to February 28) to reduce the likelihood of the subject species establishing breeding territories, nests, or burrows.
- Cease activities and contact Compliance Coordinator and Site Engineer immediately if a kit fox is observed.
- If active kit fox dens are identified during construction establish a spatial buffer around active burrows with SITLA in consultation with UDWR; or, 2) provide a biological monitor to ensure that impacts on active burrows are minimized; or, 3) conduct ground disturbing activities outside the pup rearing period from March 1 to July 1 in suitable habitat.

### Burrowing Owl

Low quality burrowing owl habitat occurs within the Project. The following UDWR approved measures will be used within burrowing owl habitat in accordance with the SITLA lease requirements and MBTA:

- Conduct a preconstruction survey to identify active burrowing owl burrows, and/or;
- Mow vegetation or collapse burrows outside breeding, nesting, and young rearing periods (September 1 to February 28) to reduce the likelihood of the subject species establishing breeding territories, nests, or burrows.
- Cease activities and contact Compliance Coordinator and Site Engineer immediately if a burrowing owl is observed.
- If active burrowing owl nests are identified during construction, establish a spatial nesting buffer with SITLA in consultation with USFWS; or, 2) provide a biological monitor to ensure that impacts on active nesting locations are minimized during construction; or, 3) conduct ground disturbing activities outside the breeding and nesting period from March 1 to August 31.

### Migratory Birds

Migratory bird habitat occurs within the Project. The following UDWR approved measures will be used within migratory bird habitat in accordance with the SITLA lease requirements, MBTA and BGEPA:

- Conduct a preconstruction survey to identify active migratory bird nests and/or;
- Mow vegetation or collapse burrows outside breeding, nesting, and young rearing periods (September 1 to February 28) to reduce the likelihood of migratory birds establishing breeding territories or nests.
- Cease activities and contact Compliance Coordinator and Site Engineer immediately if an active migratory bird nest is observed.
- If active nests are identified during construction, the Project will maintain compliance with the MBTA and BGEPA by: 1) establishing a spatial nesting buffer with SITLA in consultation with USFWS; or, 2) providing a biological monitor to ensure that impacts on active nesting locations are minimized during construction; or, 3) conducting ground disturbing activities outside the avian breeding and nesting period from April 1 to July 15 for non-raptors and from January 1 to August 31 for raptors in suitable habitat.

### *Big Game*

- Install 8-foot-high exclusionary fences around the perimeter of Project facilities to keep big game out of the property and ponds.

## *Wildfire Prevention Measures*

To minimize the potential for wildfire, the construction contractor will follow best practices including:

- equip all vehicles entering the site with spark arrestors;
- equip contractor vehicles with fire extinguishers and fire suppression equipment appropriate to the work activity;
- park vehicles only in authorized work areas that are free of vegetation; and
- immediately suppress any ignition that occurs and report the incident to the Site Engineer.

## *Operations Measures*

A summary of the approved plans that will be implemented during operations are also listed below. These plans will be implemented in addition to the Standard Operating Procedures, EHS/ESG that are required by the national safety and design codes and standards as well as industry BMPs and Project permit conditions.

## *Groundwater Monitoring Plan*

To minimize potential Project-related impacts on groundwater quality, a Groundwater Monitoring Plan has been established that is approved by the DWQ in accordance with the Groundwater Discharge Permit that authorizes construction and operation of the brine evaporation ponds. This plan requires monitoring for any potential impacts associated with discharges from the ponds during operations. Requirements include:

- The LCRS and PCMS sumps will be continuously monitored to record the leakage rate between and below the double liner system and sump pump functionality will be checked daily.
- Upgradient and downgradient shallow groundwater monitoring well data to be collected, analyzed and reported on a monthly and quarterly basis for the life of Project operations.
- Evaluation and remediation requirements if a groundwater discharge occurs.

## *Subsidence Monitoring Plan*

To minimize potential Project-related impacts on the subsurface geology in the vicinity, a Subsidence Monitoring Plan that is approved by the DWQ in accordance with the Class V UIC Permit (to be issued) that authorizes the operation of hydrogen storage caverns. This plan requires monitoring for any potential impacts associated a mechanical integrity failure of the storage caverns during construction and operations. Requirements include:

- Establishing a network of elevation monuments within and outside of the Project to provide controlled measurements.
- Data collection, analysis and reporting on a quarterly and annual basis for the life of Project construction and operations.
- Evaluation and remediation requirements if significant evidence of subsidence is detected.