SECTION A. Project Title: Carbon Free Power Project (CFPP) Site Characterization (R5)

SECTION B. Project Description and Purpose:

REVISION 5:

This revision to the Environmental Compliance Permit (ECP) for the Utah Associated Municipal Power System (UAMPS) Carbon Free Power Project (CFPP) site characterization program is intended to address 2023 work scop related to the completion of (1) supplemental electrical resistivity, (2) multi-channel analysis of surface wave (MASW) surveys, and (3) topographic survey work at the CFPP site.

UAMPS/CFPP plans to complete ten (10) electrical resistivity transects at the CFPP site. Additionally, UAMPS/CFPP plans to complete ten (10) Multi-channel Analysis of Surface Waves surveys coincident with portions of the electrical resistivity surveys at the CFPP site. The proposed extent of the resistivity surveys (totaling 8,500 linear feet) and the MASW surveys (totaling approximately 5,000 linear feet) is shown on Figures 1 and 2. Table 1 present the approximate beginning and ending coordinates for the larger resistivity lines. The area of the CFPP Site to be tested is within previously disturbed areas associated with core boring and well drilling locations.

Electrical Resistivity Surveys

Electrical resistivity surveys are expected to be implemented using a modified AGI Supersting R8 resistivity system. The survey equipment consists of a series of metal electrodes, cables, switch boxes, control instrument, and a 12V deep marine battery. Eight of the lines are approximately 975 ft long and will have 150 metal electrodes (18” long, ½” diameter metal rods) spaced 6.5 feet along the line. The remaining two lines will be approximately 360 ft long and will have 112 electrodes spaced 3.3 ft along the line. The electrodes will be hammered into the soil approximately 10-12 inches. If field conditions prevent the electrodes from being hammered into the ground, they will be installed using a hammer drill. The electrodes will be interconnected using a series of cables terminating into a switch box attached to the AGI SuperSting R8 instrument. The instrument injects a current up to 2 amperes into the ground using two electrodes and the potential difference is measured between two different electrodes. The instrument runs through a programmed series of commands using different geometries of current/potential electrodes. The measurements at the site will take up to 8 hours per line to complete. The acquisition geometry will allow exploration depths up to 150 feet. A photograph of the equipment deployed in a field setting is provided in Figure 3.

The impact of the resistivity surveying should be limited largely to minor soil or vegetation disturbance from overland movements of the technicians implementing the survey and any support vehicles (Gator™ utility vehicles or equivalent side-by-side UTV). It should be noted that generation of fugitive dust, vehicle exhaust emissions, and unintentional fluid releases (oils, diesel, etc.) are also potential environmental impacts; however, exhaust emissions from the UTV should be well below significant (reportable) levels, and potential fluid releases will be mitigated via the implementation of formalized spill prevention measures.

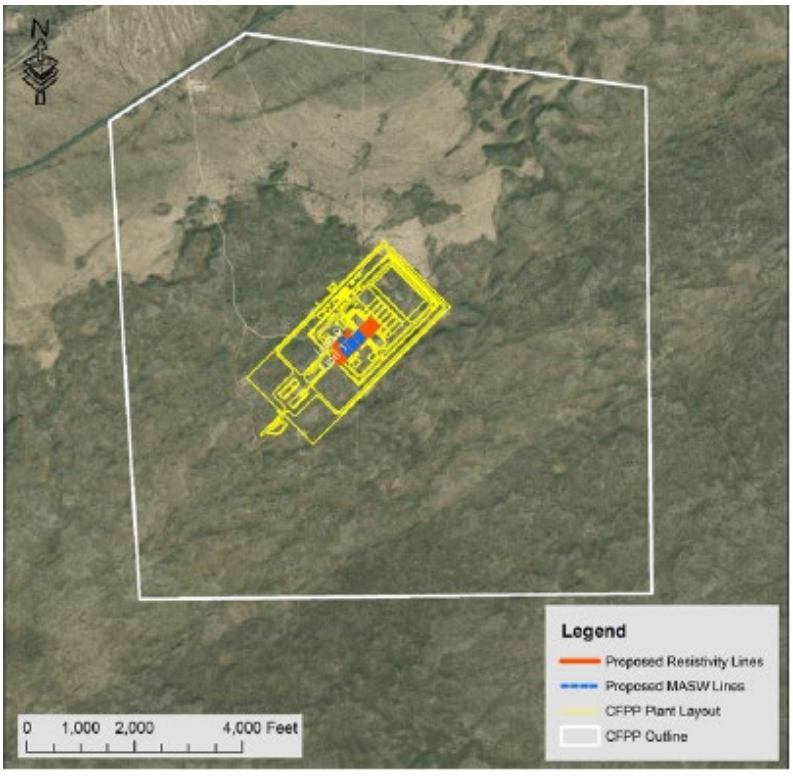


Figure 1. Location of electrical resistivity (red) and MASW lines (blue) at the CFPP site.

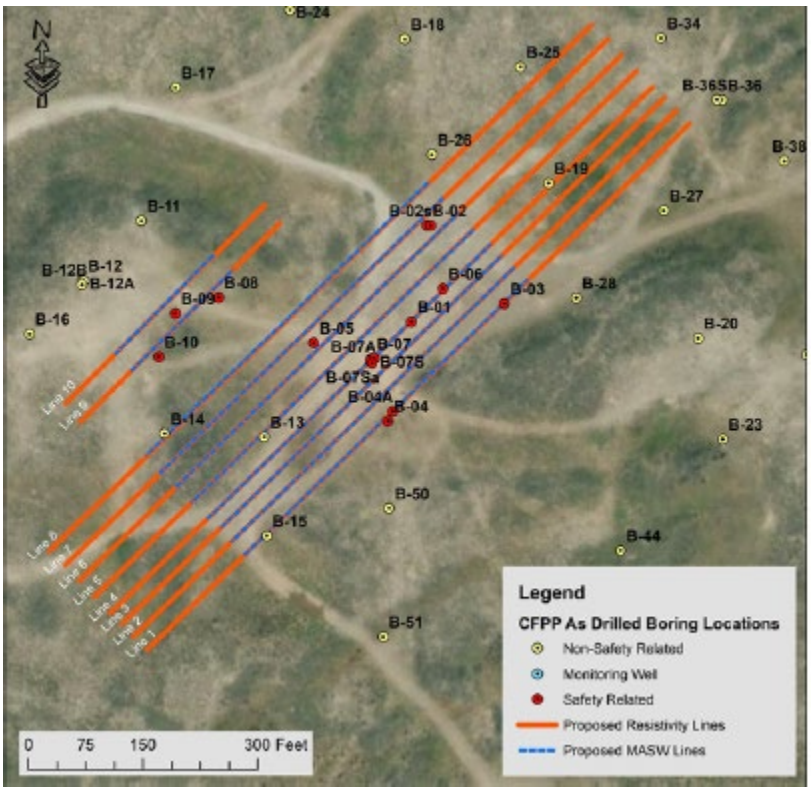


Figure 2. Planned layout of proposed electrical resistivity (red) and MASW lines at the CFPP site.

Figure 3. Resistivity system deployed in the field. Note the cables connected to the electrodes in the background, with the 12V battery, AGI SuperSting R8 Control unit, and a SwitchBox. A similar system will be deployed at the CFPP site except multiple switch boxes will be employed to handle the proposed electrode configuration.

MASW Surveys

MASW surveys at the CFPP will be executed using forty-eight (48) 4.5 Hertz vertical geophones spaced 10 ft along the lines depicted in Figure 2. The geophones will be connected using a spread cable to two (2) Geometrics Geode 24- channel exploration seismographs. The seismic source for the eight (8) long lines will be an RT Clark PEG40 accelerated weight drop (AWD) and a 10-20lb sledgehammer for the two shorter lines. The AWD system will be deployed from (i.e., mounted on) a side-by side UTV. Shot spacing will be 10 to 20 feet, as field-determined based on signal response and data quality. Source-receiver spacings should provide exploration depths on the order of 100 feet using the sledgehammer and 200 feet using the AWD.

The impact of the MASW surveying should be limited largely to minor soil or vegetation disturbance from overland movements of the technicians implementing the survey and the seismic source vehicle (Gator™ utility vehicles or equivalent side-by-side UTV). Projected truck and support vehicle disturbance extents are expected to be limited to a 5-10ft wide swath centered on the lines

shown on Figure 2. Similar to the previously completed SASW and high-resolution reflection seismic surveys, the width is expected to accommodate vehicular traffic, geophone and cable placement, and discrete positioning of the seismic source. Placement of the geophones is also surficial and should require only very shallow hand-excavation (less than 3-inches) to ensure proper ground coupling. It should be noted that generation of fugitive dust, vehicle exhaust emissions, and unintentional fluid releases (oils, diesel, etc.) are also potential environmental impacts; however, exhaust emissions from the UTV should be well below significant (reportable) levels, and potential fluid releases will be mitigated via the implementation of formalized spill prevention measures.

Table 1. Coordinates for the begging and ending of the proposed electrical resistivity lines at the CFPP site.

Line	Length	Start Easting (1)	Start Northing (2)	End Easting (1)	End Northing (2)
Line 1	975	1890210.870	719141.364	1890921.373	719829.516
Line 2	975	1890192.745	719158.089	1890903.248	719846.240
Line 3	975	1890177.451	719174.846	1890887.954	719862.997
Line 4	975	1890162.190	719188.782	1890872.693	719876.932
Line 5	975	1890141.180	719210.178	1890851.683	719898.326
Line 6	975	1890122.058	719231.595	1890832.560	719919.742
Line 7	975	1890102.957	719251.131	1890813.459	719939.277
Line 8	975	1890081.979	719269.706	1890792.482	719957.850
Line 9	360	1890123.471	719439.489	1890384.819	719699.247
Line 10	360	1890103.695	719463.093	1890365.043	719722.851

Topographic Surveys

Construction planning efforts require detailed topographic survey information in addition to the previous drone and LIDAR survey activities previously performed at the CFPP site. These surveys are planned to be conducted over an approximate 1000-acre area of the CFPP site during the spring/early summer of 2023, using the T-11 roadway and other existing pathways on site as the primary access routes for the surveys. Attachment 1 shows the area planned for surveys. Survey methodology is to collect survey data while minimizing impacts to existing vegetation, with options to use techniques including drone, LIDAR, and ground survey. Part of the survey work scope includes installation of three permanent survey benchmarks/monuments.

Revision 4

This revision to the Environmental Compliance Permit (ECP) for the Utah Associated Municipal Power Systems (UAMPS) Carbon Free Power Project (CFPP) site characterization program is intended to cover new work scope related to the completion of supplemental spectral-analysis-of survey-waves (SASW) and seismic reflection surveys at the CFPP. This revision also addresses the placement of new temporary infrastructure (trailers and generators) in the existing administrative area at the CFPP.

Supplemental SASW Surveys

UAMPS plans to complete supplemental SASW surveys on six (6) lines centered on the reactor building area at Location 2A of the CFPP, as previously described in Attachment 1 to Revision 2 of the ECP for the CFPP (INL-19-067 R2). Approximate surface traces of these proposed supplemental SASW lines are shown on Figure 1. Estimated start point and end point coordinates for each of the SASW survey lines are correspondingly presented in Table 1. This area has been surveyed (for biological and cultural resources) and mowed for mitigation of wildland fire risk and bird nesting as per Revision 3 of the ECP for the CFPP (INL-19-067 R3).

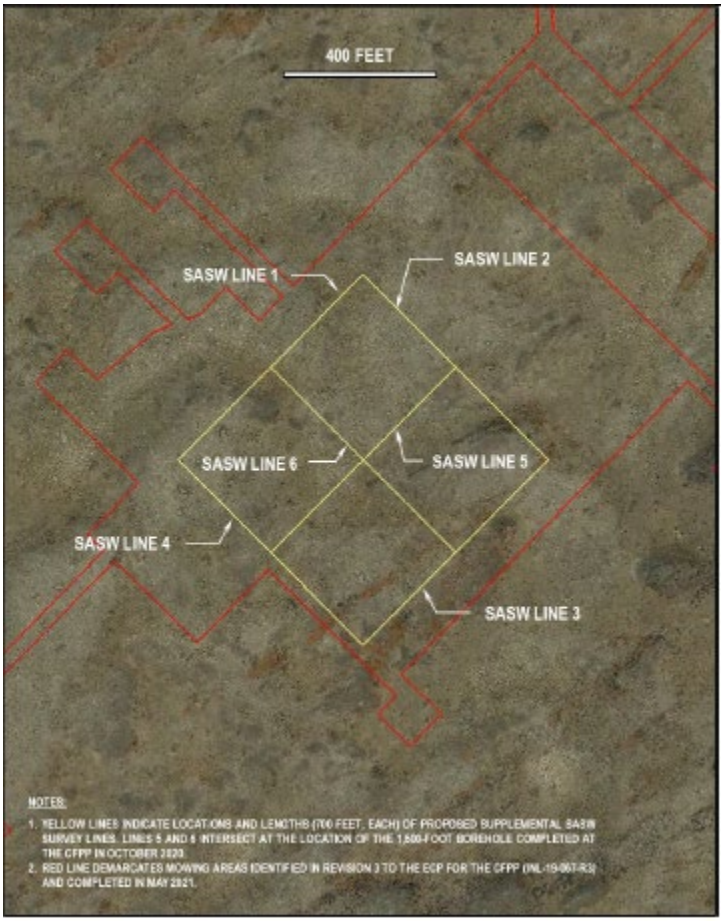


FIGURE 1. PROPOSED LOCATIONS OF SPECTRAL-ANALYSIS-OF-SURFACE-WAVES (SASW) SURVEY LINES

TABLE 1
SASW SURVEY LINE DETAILS

LINE	LENGTH	ORIGIN		TERMINATION	
	(ft)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)
1	700	43.637217	-113.056978	43.638575	-113.055109
2	700	43.638575	-113.055109	43.637218	-113.053239
3	700	43.637218	-113.053239	43.635860	-113.055109
4	700	43.635860	-113.055109	43.637217	-113.056978
5	700	43.636540	-113.056045	43.637895	-113.054172
6	700	43.637895	-113.056045	43.636540	-113.054172

As noted in Attachment 1 to Revision 2 of the ECP, SASW testing involves the generation of long-period elliptical surface waves from a fixed location on an exposed material surface, and the measurement of resulting ground motions along a single path radiating from the wave source. Representative photographs of the surface wave source (a large vibroseis truck) and the measurement arrays (geophone receivers) expected to be used in the supplemental SASW surveys at the CFPP are shown in Figures 2 and 3. Consistent with SASW surveys previously completed at the CFPP, the potential area of impact on any given SASW survey line should be limited

to approximately 12 feet on either side of the center lines shown on Figure 1. This 24-foot total width should accommodate vehicle drive-over, geophone (receiver) and cable placement, and discrete locations of ground cover flattening via impacts of the surface wave source. Placement of geophones is strictly surficial and should require clearing of no more than one (1) square foot of any remaining (mowed) ground cover.

FIGURE 2. TRUCK-MOUNTED SURFACE WAVE SOURCE SYSTEM OPERATING AT THE CFPP IN OCTOBER 2019

FIGURE 3. EXAMPLE GEOPHONE PLACEMENT ALONG ON AN SASW SURVEY LINE AT CFPP IN OCTOBER 2019

Maximum vertical and shear forces produced by the surface wave source to be used at the INL are approximately 20,000 pounds and correspond to a normal operating frequency range of 1.3 hertz to 75 hertz. Such low frequency waves should not propagate to, or be registered by, automatic seismic trip systems or accelerometers installed on neighboring INL facilities. Strain levels in the geologic materials impacted by the surface wave source system should also be extremely small (below 0.000001 percent) and thus should result in only very small, non-impactful elastic motions.

Seismic Reflection Surveys

UAMPS plans to similarly complete two (2) high-resolution seismic reflection survey transects at the CFPP site and on adjacent Bureau of Land Management (BLM) areas located north of the CFPP. The proposed extent of the HRS surveys (totaling 4.375 linear miles) are shown on Figure 4 and detailed on Table 2. UAMPS representatives will coordinate with BLM staff, as needed, regarding survey transect sections extending outside of INL areas. Depending on current fire conditions on the INL, these lines may also need to be mowed (and surveyed) prior to commencement.

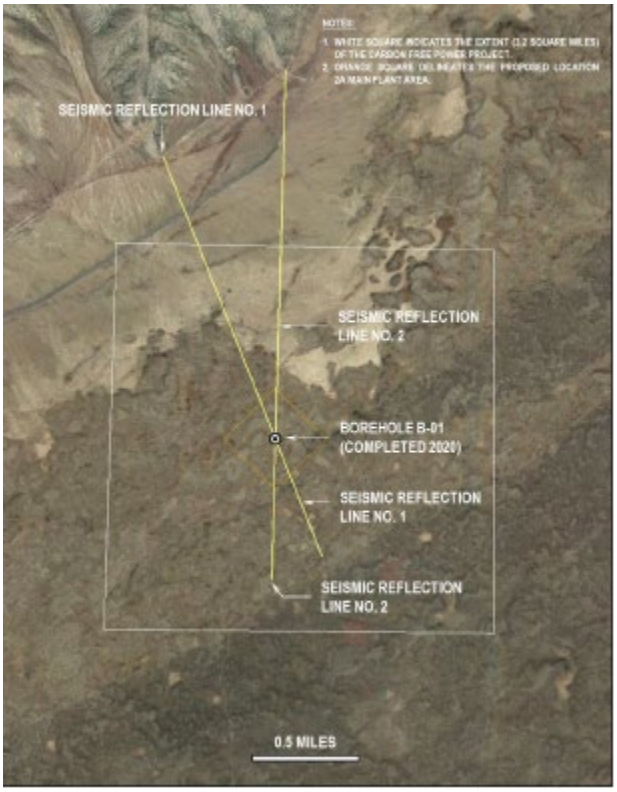


FIGURE 4. PROPOSED LOCATIONS OF SEISMIC REFLECTION SURVEY LINES

TABLE 2
SEISMIC REFLECTION SURVEY LINE DETAILS

LINE	LENGTH	ORIGIN		TERMINATION	
	(ft)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)
1	10,600	43.629317	-113.050763	43.656313	-113.065648
2	12,500	43.627805	-113.055487	43.662085	-113.054175

The seismic reflection surveys are expected to employ up to 400 Sunfull Model PS-14B geophones (measurement points) connected via a long, ground-laid cable (a geophone string). A one-page manufacturer's cutsheet for the geophones can be provided by project personal on request. Geophones are expected to be spaced in grouped intervals of 20 feet or more, depending on ground conditions. Data from the geophones (i.e., seismic signals) will in turn be recorded via a Seistronix EX6 seismograph system housed in a standard, cabbed pick-up truck (the seismic "doghouse").

UAMPS intends to use the previously described SASW vibroseis truck as a seismic source for the seismic reflection surveys at the CFPP, as well as a separate 450-pound accelerated hammer system. This hammer system (a United Service Alliance Model AF-450) will be mounted on an International Harvester Model IH-50 rubber-tracked vehicle or a Model 4800 truck. A cutsheet for the AF-450 hammer can be provided by project personnel on request; an example photograph of the AF-450 hammer system mounted on a rubber-tracked vehicle is provided in Figure 5. Seismic source shot spacing is expected to be based on signal response and data quality as determined during initial field testing.

FIGURE 5. EXAMPLE FIELD DEPLOYMENT OF AN AF-450 HAMMER SYSTEM ON A RUBBER-TRACKED VEHICLE

The impact of the reflection surveying should be limited largely to minor soil or vegetation disturbance from overland movements of the seismic source (i.e., the vibroseis truck, the IH-50, or the Model 4800 truck) and support vehicles (Gator™ utility vehicles or equivalent quad-runners and the doghouse truck). Projected truck and support vehicle disturbance extents are expected to be limited to an 80-foot swath centered on the lines shown on Figure 4. Similar to the SASW surveys, this width is expected to accommodate vehicular traffic, geophone and cable placement, and discrete positioning of the seismic source and seismic recording (doghouse) trucks. Placement of the seismic reflection survey geophones is also surficial and should require only very shallow handexcavation (less than 3-inches) to ensure proper ground coupling.

It should be noted that generation of fugitive dust, vehicle exhaust emissions, and unintentional fluid releases (oils, diesel, etc.) are also potential environmental impacts; however, exhaust emissions from the seismic source truck should be well below significant (reportable) levels, and potential fluid releases will be mitigated via the implementation of formalized spill prevention measures.

New Temporary Infrastructure

Previous temporary infrastructure for the CFPP site characterization efforts included one (1) project trailer and an associated mobile diesel generator for electrical power in the fenced CFPP administrative area adjacent to Highway 33. Site characterization activities at the CFPP planned during 2021 will require additional temporary trailers and associated mobile diesel generator units. Specifically, one (1) additional project office trailer is needed to accommodate the increased number of field-based project personnel. No more than four (4) ground-level office/storage combination trailers (including fullwidth swing doors) are also planned for placement in the administrative area, to store core samples from drilling activities. These storage trailers require continuous climate control for proper core sample preservation. Power for these storage trailers (and for the project office trailers) is expected to be supplied by temporary, mobile generator units (one [1] generator for each trailer). Generators to be deployed on-site are not expected to exceed 50 kilovolt amperes (kVA) in size. Periodic refueling of the generators is planned to be accomplished using INL Site Services fuel delivery trucks. Each mobile generator unit will be surrounded by a portable liner to prevent ground contamination in the event of a diesel spill/leak.

Transfer of core storage materials to longer-term storage facility is planned to be completed prior to the end of 2021, at which time the emptied, temporary core storage containers, one (1) office trailer, and the mobile generators will be removed by the vendor/supplier. One (1) trailer will remain on-site for use during long-term groundwater and meteorological monitoring. If a temporary mobile generator is needed to supply power to the remaining project trailer through the winter, it would be removed from the site within twelve months of installation.

Revision 3
The purpose of this revision is to add planned work scope associated with changes to the core boring/well drilling locations proposed for completion in 2021, minor improvements to T-11 and access routes from T-11 to core boring locations, and expansion of area to be mowed prior to the continuation of drilling. For efficiency and clarity, this Environmental Compliance Permit (ECP) revision does not include all information discussed and analyzed in the prior versions. Previous revisions to this document (with additional graphics and descriptions) can be found in INL-19-067 R2, INL-19-067 R1, and INL-19-067. However, all Environmental Aspects and Impacts, Hold Points, and Project Specific Instructions are consistent between all versions of the CFP revisions and are captured here in Revision 3 as well.

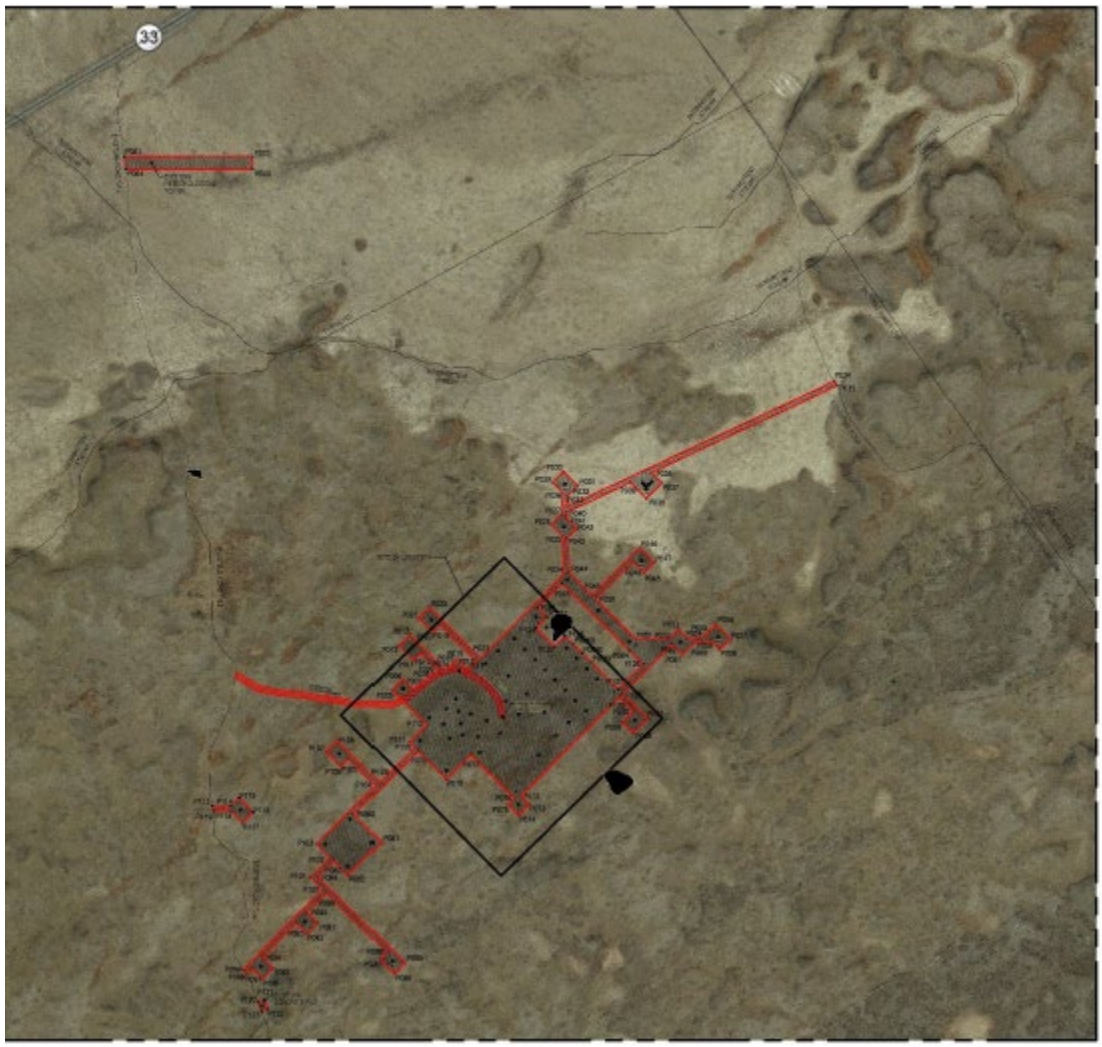
On-going CFPP design efforts have enlarged the facility footprint and shifted some of the planned core boring and well drilling locations outside of the originally proposed Location 2A area, which is now the preferred location of the CFPP facility. Specifically, the facility footprint has expanded in the southwestern and northeastern direction, and as a result, there are likely to be core boring activities and monitoring/testing well drilling activities which are no longer inside the bounds of Location 2A as shown on Figure 2-1. Mowing of vegetation in these expanded areas is planned in the spring of 2021 to mitigate risks of wildland fire and bird nesting activities during core boring and well drilling activities. Mowing of the areas surrounding the existing meteorological tower is also planned to facilitate laydown and repairs to the tower instrumentation. This mowing plan encompasses approximately 40 – 50 acres in Location 2A and areas immediately surrounding Location 2A, along with the aforementioned area immediately adjacent to the meteorological tower. All of the areas planned for mowing have only sparse sagebrush cover. While the majority of access for the planned work is expected to be via the T-11 roadway, access to the northeastern-most monitoring well locations may include use of the T-3 Stage Road and the Rocky Mountain Power transmission line road. Such a route would also provide a secondary egress pathway from the CFPP drilling sites out to Highway 33 in the event of wildland fire or other emergencies.

The current mowing plan is shown in the attachment; however, some further adjustments to the mowing plan locations may be needed to account for unsuitable site conditions and/or final designs. Prior to mowing, new cultural and biological surveys of the affected areas would be completed. Please note: there are two large non-uniform black shapes located on the map. These are areas designated as avoidance locations. Further instructions are in the Hold Points.

With regard to access route improvements, the main area of the CFPP's core boring site is accessed via an existing INL two-track access road (T-11) and a short overland (off-road) route extending roughly 0.4 miles eastward from the existing two-track road. Several rock outcroppings along the route make travel difficult for water truck support, and consequently slow drilling operations to a significant extent. Consideration is being given in work scope planning to improve the travel route by use of a skid-steer loader or a backhoe (with a bucket) to level and smooth areas of existing rock outcroppings on the overland route extending from the T-11 two-track to the main CFPP drill site.

Surface disturbance associated with leveling and smoothing is largely expected to be limited to depths of less than 12-inches, excepting some deeper pitting likely to be associated with the removal of larger rock fragments. The CFPP would limit improvements to a 0.5-mile segment of the T-11 two-track. This segment would extend from the termination point of previously completed improvements on T-11 (at a point approximately 0.46 miles south of State Highway 33) to the drill site turn off (approximately 0.96 miles from the intersection of T-11 and State Highway 33). Improvements along this segment would only include targeted (spotty) grading and leveling of particularly uneven track sections or locations with exposed boulders, and to placement of gravel on particularly problematic areas. We expect this gravel placement to be limited largely to the placement of 2 to 3 cubic yards of gravel on the first sharp elevation rise on the T-11 two-track, at a location with prominent surface exposures of rock. Placement of the gravel is also expected to be completed using a skid-steer loader or a backhoe with a bucket. Gravel will be spread only on the existing road surface, to fill-in low areas between rock exposures. Compaction is expected to be provided only by movement of vehicles across the surface.

The areas planned for the route access improvements have been previously surveyed for cultural resources and biological impacts. Also, the environmental footprint impacts associated with these activities will be largely enveloped by those already realized by initial core boring activities and overland travel in support of those activities to date. Areas identified in previous surveys will be avoided by all project related activities. Additionally, a physical barrier will be erected to ensure all vehicles will avoid the area near P124, P125, and P126. The following attachment shows the areas needing mowed for 2021 in red. Since some of the areas are small and detailed, it is safe to assume total mowed areas may extend beyond the boundaries shown. A buffer should be considered when field surveys are completed.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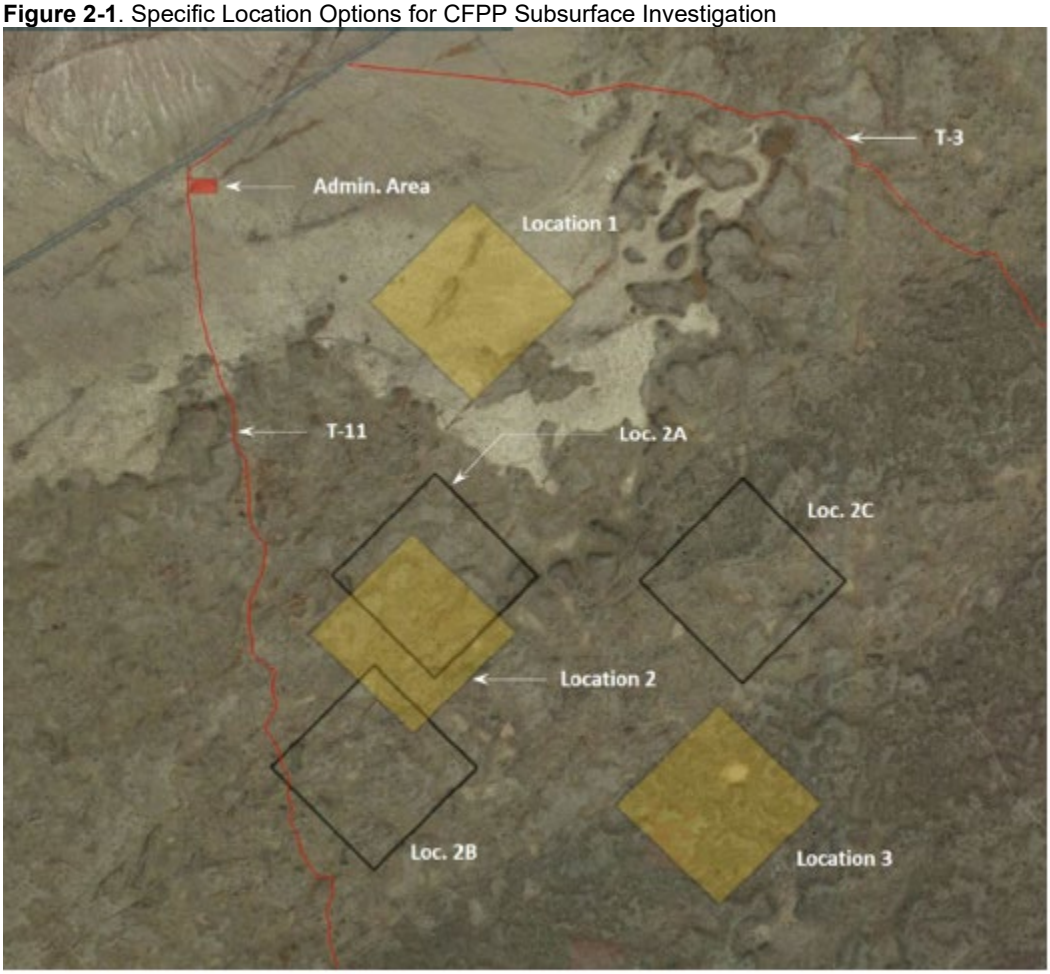
Revision 2
The purpose of this revision is to update the scope for the proposed Carbon Free Power Project (CFPP). The project has developed additional details for core boring and well drilling activities. In 2019 the project completed several activities described in previous versions of this environmental checklist (EC), including improving access to the project site off Highway 33 and improving the T-11 road; installing barriers to prevent traffic on abandoned sections of T- 11, a fenced administrative area and project trailer, portable toilet stations at the administrative area, a temporary seismic monitoring station near the Deadman meteorological tower just off T-11, and two small concrete pads adjacent to T-11 and T-3 for Spectral Analysis of Surface Waves (SASW) testing; and erecting a meteorological tower. The project has also completed SASW testing and magnetometry surveys.

The project has revised original plans to install overhead electrical power supply lines from the Howe Peak transformer to the CFPP site and install a backup electrical generator at the administrative area. Instead, the project plans to install a propane-powered electrical generator at the administrative area to supply routine electrical power loads. Core boring storage for the project may include a CONEX-type trailer located adjacent to the USGS core boring storage library at CFA.

The project had planned to mow about 70-acres in the southeast corner of the Carbon Free Power Project (CFPP) Site where the core borings and well drilling were being considered ("Location 3") and about ¾-mile from the T-11 road to the 70-acre area for drill rigs and support vehicle travel. These areas contain dense sage brush, and mowing has high potential to impact sage-grouse and other nesting birds. After reviewing data from the 2019 SASW testing and magnetometry surveys, the project proposes to relocate core borings and well drilling to a site near the center of the CFPP area closer to "Location 2" in Revision 1, Figure 6. This area appears to provide improved subsurface characteristics and significantly less impacts to sage-grouse and other nesting birds. The project considered three areas (each about 70 acres) near Location 2 and plans to focus the subsurface investigation at Location 2A (shown in figure 2- 1). Grass and a small amount of sagebrush comprise most of the vegetation at Location 2A, and the project anticipates that a small amount, if any, mowing will be necessary. Project personnel will access Location 2A via a short path from T-11 east to the western corner of Location 2A. The project will complete biological and cultural resource surveys at Location 2A layout and determine the need for mowing.

Figure 2-1. Specific Location Options for CFPP Subsurface Investigation



Current site characterization plans for Location 2A include drilling 40 – 50 boreholes (with depths ranging from 100 feet to 1500 feet) and 10 -12 observation wells, including an aquifer pump test well cluster. The project plans to mow or clear a 30-foot buffer area at each drill rig location for wildland fire prevention. Additional mowing and clearing may be needed on areas where drill rig and support traffic will traverse from the T-11 road to each drilling location. Borehole and observation well construction involves continuous core drilling, reaming after coring, setting well casings to various depths, collecting geophysical logs, and testing well productivity. The project is evaluating specific locations for the wells and boreholes.

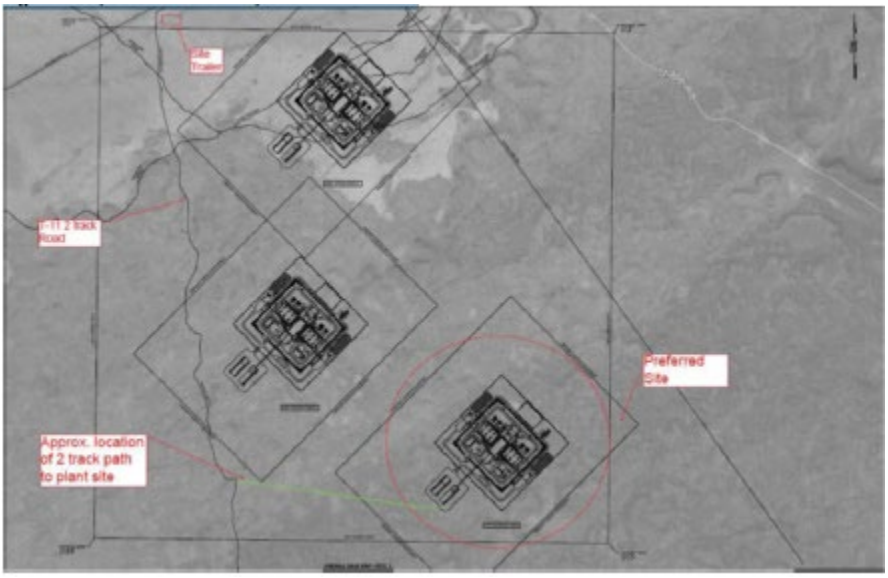
If initial core boring activities at Location 2A indicate the site is unsatisfactory for facility construction, the project plans to move subsurface investigations to Location 2B or 2C and complete additional biological and cultural resource surveys prior to work execution.

In addition, the powerline (about 3.2 miles long) connecting to the Howe Peak Transformer along Highway 33 discussed in previous versions is no longer proposed and has been removed from the following discussion..

Revision 1

The proposed action performs site characterization studies to determine capability and suitability for locating a small modular reactor (SMR) on about 2000 acres at the Idaho National Laboratory (INL) Site in Butte County, Idaho and to gather data for preparing a Combined License Application for an SMR. To complete site characterization, the project constructs roads to the site, procures and installs an office trailer, and erects a 60-meters high (about 197 ft) meteorological (met) tower. Figure 1 shows the project area in relation to the potential SMR location. The proposed action also maintains the T-11 road as necessary by dumping gravel fill material in holes and ruts then levelling and establishes a two-track road from T-11 to the potential SMR location (See Figure 1), about 1.1 miles from the T-11 road (See Section E, Project-Specific Instructions, #4). This proposed SMR location is under review and no decision has been made to site such a facility. A decision to use the proposed location for purposes other than site characterization studies is subject to further NEPA review.

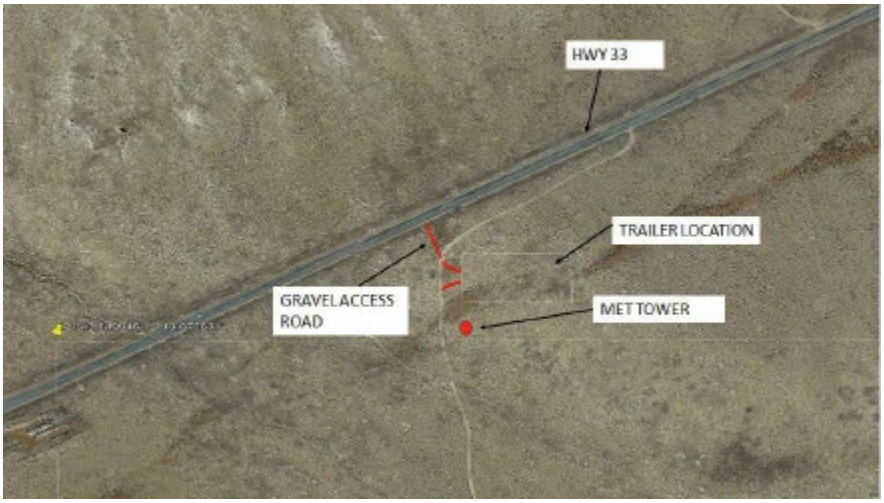
Figure 1. Project area in relation to potential SMR location.



The proposed action constructs a gravel road (about 25 ft wide by 250 ft long) from Highway 33 to the office trailer location using heavy equipment (graders, dump trucks, bulldozers, etc.) and a road adjacent to the proposed office trailer and met tower (about 25 ft wide and 400 ft long). The entrances to the abandoned section of T-11 (i.e., the old Highway 33 access) would be blocked at both ends to prevent use (e.g., by using barricades, signs, or other approved methods). Road construction includes installing drainage features such as culverts if needed.

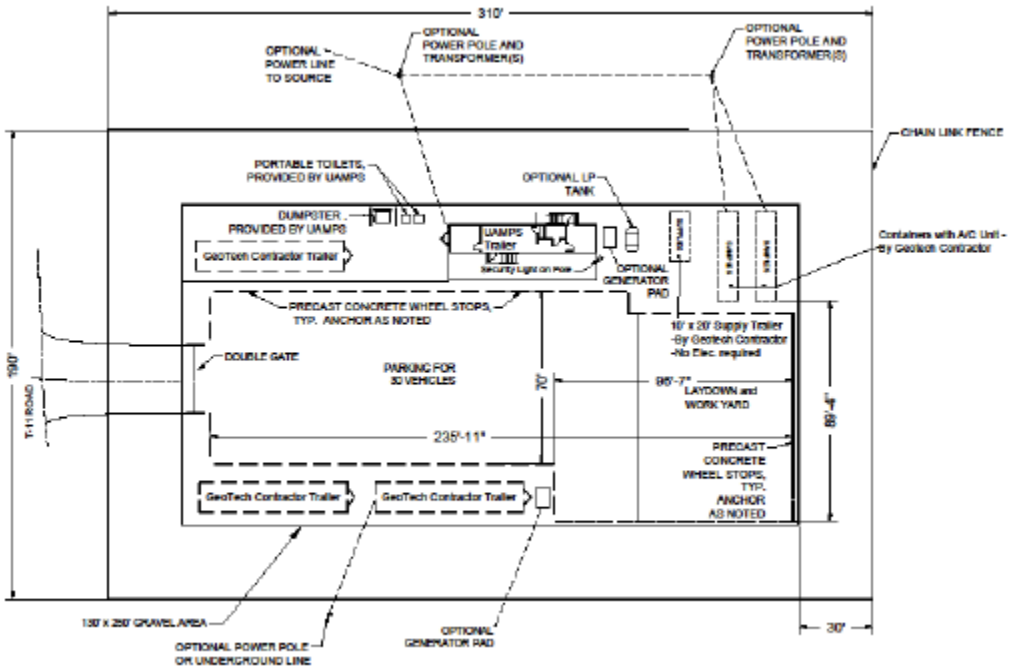
Project scope includes grading and levelling an administrative area about 130 ft by 250 ft for placing the 12 ft by 60 ft office trailer and parking area -. The met tower requires a metal base plate and instrumentation placed on a graded and levelled 20 ft radius area. Four screw-in anchors hold guy wires about 150 ft from the tower. The proposed action has the potential to disturb about 4.8 acres (See Section E, Conditions and Project-Specific Instructions related to Cultural and Biological Resources. Figure 2 depicts approximate locations for roads, the office trailer, and the met tower.

Figure 2. Approximate locations for roads, an office trailer, and met tower.



The administrative area supports a parking area, laydown yard, two climate-controlled 8 ft x 40 ft Conex boxes for storing core borings and soil samples, support crew trailers, and portable concrete curbs that line the perimeter. Construction grades the area, places pit run gravel, installs the office trailer and auxiliary equipment (e.g., pole mounted security light, generators, equipment trailers, restroom trailers, comfort stations, and miscellaneous apparatus and gear) near the support trailer, and constructs a 6 ft high chain link fence with personnel barriers around the perimeter of the office trailer and parking area. A remote monitoring system to alert loss of electric power and temperature excursions in the core boring storage containers. A propane-powered backup generator and propane tank (or diesel-powered electric generator) supply electrical power, and a 50 ft mowed buffer may be required around the gravel pad to meet wildland fire requirements. Figure 3 shows the proposed layout of the administrative area.

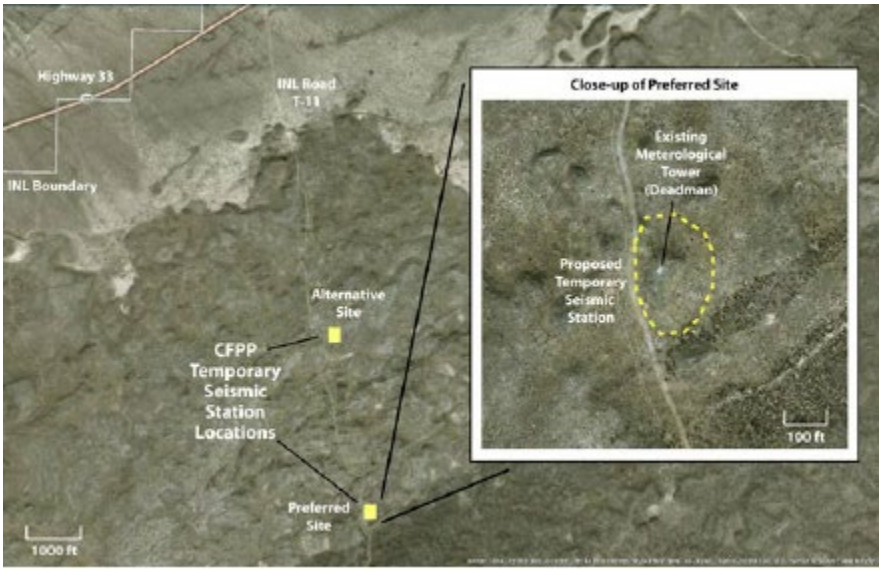
Figure 3. Proposed administrative area for proposed office trailer and support equipment.



Initial site characterization activities also install a temporary seismic station disturbing an area about 50 ft in diameter. Two locations for the temporary seismic station are being considered, with the preferred location near the met tower (Deadman) just off the T-11 road (see Figure 4). The alternative site is located further north just off T-11. Constructing the temporary seismic station includes:

- Hand excavating a 12-inch diameter, 2-ft deep hole to house a three-component seismometer
- Hand excavating a 12-inch diameter, 2-3 ft deep hole to hold a 10 ft long pole (3-inch diameter) for an antenna and solar panel
- A 2 ft x 3 ft metal box placed on the ground near the antenna pole to house batteries, datalogger, and 2.4G digital radio.

Figure 4. Map shows the two locations for a temporary seismic station along INL road T-11.



If the project area is selected for locating an SMR, then additional review under the National Environmental Policy Act (NEPA) is required. Detailed subsurface investigations requiring two deep seismic velocity boreholes would also be needed, which likely involves removing the temporary seismic station and installing a permanent seismic station near one of the seismic velocity boreholes. Converting temporary seismic stations to a permanent one usually requires disturbing an area about 50 ft in radius around the station to complete the following activities:

- Placing a 4 ft-diameter concrete circular pad housing a circular culvert enclosure (4 ft high) and steel lid with handle
- Hand-auguring a 12-inch diameter hole to a depth of 3 or 4 ft to place a steel rod in concrete
- Hand-excavating a 3 x 3 ft base for a 10 ft tower in 1 to 2 ft of concrete.

In general, a permanent seismic station consists of the following instrumentation:

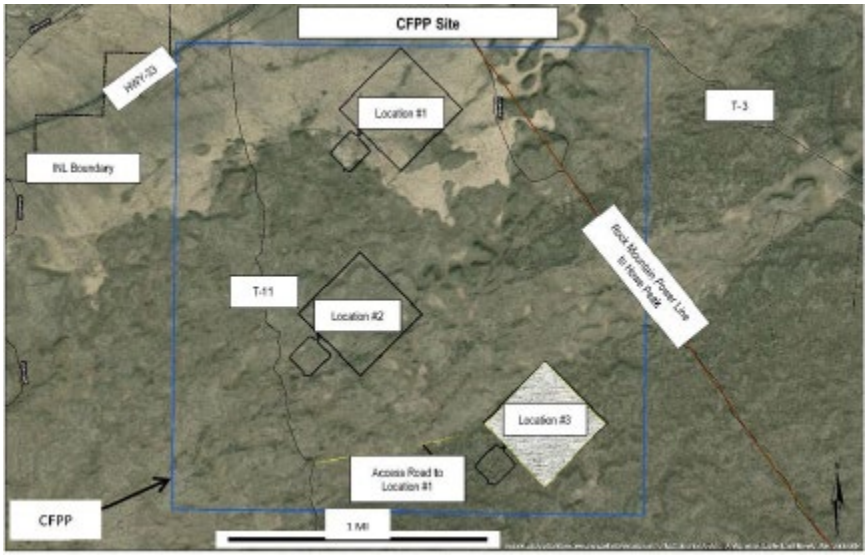
- A datalogger, three-component broadband seismometer, and three-component accelerometer housed in the culvert enclosure
- Two solar panels and one antenna attached to the tower
- Global Positioning System (GPS) antenna attached to the top of the steel rod
- Digital 2.4G radio and GPS receiver in a small enclosure on the tower
- A 2 x 3 ft steel box set on the soil surface adjacent to the tower to house two or more sealed 12-volt, 100 amp/hr. Gel Cell batteries.

Site characterization also includes drilling about 40 boreholes and 10 observation wells, including an aquifer pump test well cluster, which require removing vegetation for heavy equipment access to the boreholes and observation well locations. Borehole and observation well construction involves continuous core drilling, reaming after coring, setting well casings to various depths, collecting geophysical logs, and testing well productivity. Specific locations for the wells and boreholes are presently unknown. This environmental checklist (EC) will be revised to evaluate these locations when they are identified, as needed.

In support of borehole and well construction planned for the spring of 2020, mowing of affected areas is planned for the fall of 2019. Areas planned to be mowed include an approximate 70-acre reactor building area in the southeast corner of the Carbon Free Power Project (CFPP) Site where the core borings would need to be located, and an approximate ¾-mile track from the T-11 roadway to the 70-acre reactor building area for drill rigs and supporting vehicle traffic to traverse (See Figure 5).

Special Note: Before mowing activities can take place DOE needs to consult with the U.S. Fish & Wildlife Service (FWS) regarding the large-scale removal of sagebrush from the 'Sage Grouse Conservation Area' (SGCA), a requirement of DOE's Candidate Conservation Agreement (CCA) with the FWS. CFPP Location 3 falls within the SGCA (See Section E, Conditions, #s 11 & 14).

Figure 5. Proposed areas to be mowed in preparation of future core boring/drilling locations.

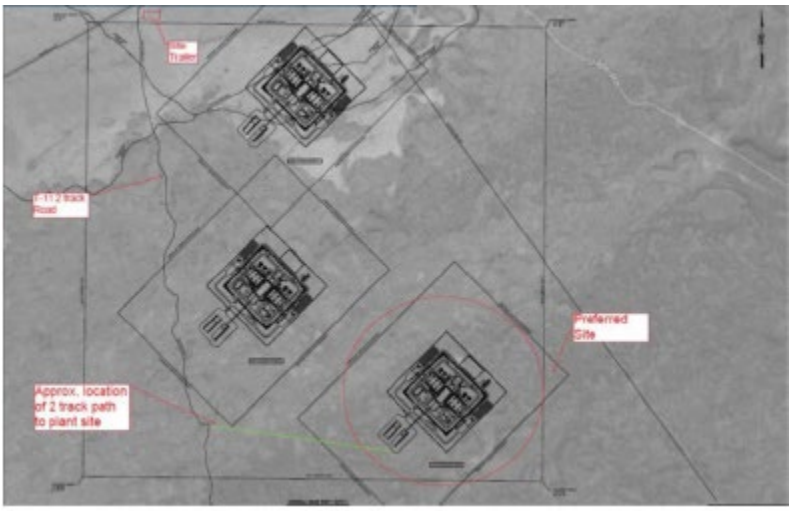


In addition, prior to borehole and well installation, during the fall of 2019, seismic testing it planned to be conducted at the CFPP Site, comprised of a magnetic survey and spectral analysis of surface waves (SASW) activities. Preparations for the planned seismic testing includes pouring two 7 feet x 10 feet pads, one adjacent to the T-11 road, and one along the T-3 road to give the truck mounted wave generator an impact point. The scope of work for seismic testing is described in Attachment 1 'Seismic Testing Summary Description'.

Original EC

The proposed action performs site characterization studies to determine capability and suitability for locating a small modular reactor (SMR) on about 2000 acres at the Idaho National Laboratory (INL) Site in Butte County, Idaho and to gather data for preparing a Combined License Application for an SMR. To complete site characterization, the project constructs roads to the site, procures and installs an office trailer, and erects a 60-meters high (about 197 ft) meteorological (met) tower. Figure 1 shows the project area in relation to the potential SMR location. The proposed action also maintains the T-11 road as necessary by dumping gravel fill material in holes and ruts then levelling and establishes a two-track road from T-11 to the potential SMR location (See Figure 1), about 1.1 miles from the T-11 road. This proposed SMR location is under review and no decision has been made to site such a facility. A decision to use the proposed location for purposes other than site characterization studies is subject to further NEPA review.

Figure 1. Project area in relation to potential SMR location.



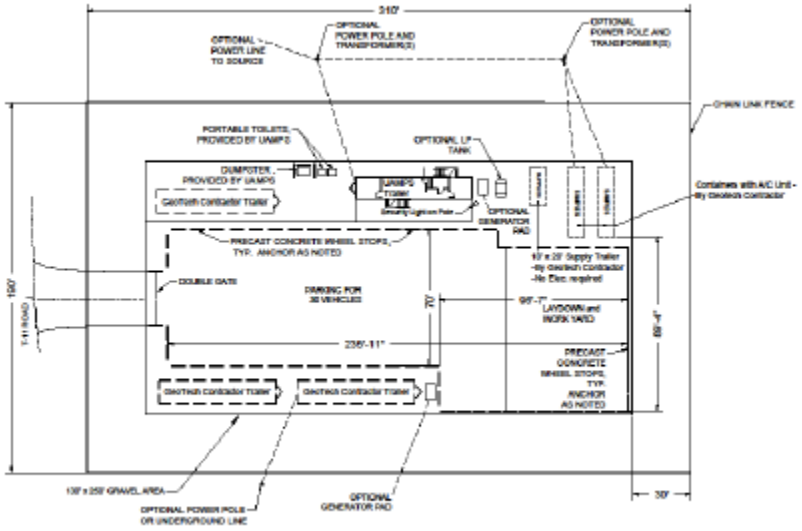
The proposed action constructs a gravel road (about 25 ft wide by 250 ft long) from Highway 33 to the office trailer location using heavy equipment (graders, dump trucks, bulldozers, etc.) and a road adjacent to the proposed office trailer and met tower (about 25 ft wide and 400 ft long). Barricades will be placed at the old Highway 33 access to T-11 north of the new access road and at the point where the new road intersects with the portion of T-11 running from the old Highway 33 access. Road construction includes installing drainage features such as culverts if needed.

Project scope includes grading and levelling an administrative area about 130 ft by 250 ft for placing the 12 ft by 60 ft office trailer and parking area and an area about 200 ft in radius for the met tower. The met tower requires a metal base plate and instrumentation placed on a graded and levelled 20 ft radius area. Four screw-in anchors hold guy wires about 150 ft from the tower. The proposed action has the potential to disturb about 4.8 acres. Figure 2 depicts approximate locations for roads, the office trailer, and the met tower.

Figure 2. Approximate locations for roads, an office trailer, and met tower.

The administrative area supports a parking area, laydown yard, two climate-controlled 8 ft x 40 ft Conex-type boxes for storing core borings and soil samples, support crew trailers, and portable concrete curbs that line the perimeter. Construction grades the area, places pit run gravel, installs the office trailer and auxiliary equipment (e.g., pole mounted security light, generators, equipment trailers, restroom trailers, comfort stations, and miscellaneous apparatus and gear) near the support trailer, and constructs a 6 ft high chain link fence with personnel barriers around the perimeter of the office trailer and parking area. A remote monitoring system to alert loss of electric power and temperature excursions in the core boring storage containers. A propane powered backup generator and propane tank supply backup power, and a 50 ft mowed buffer may be required around the gravel pad to meet wildland fire requirements. Figure 3 shows the proposed layout of the administrative area.

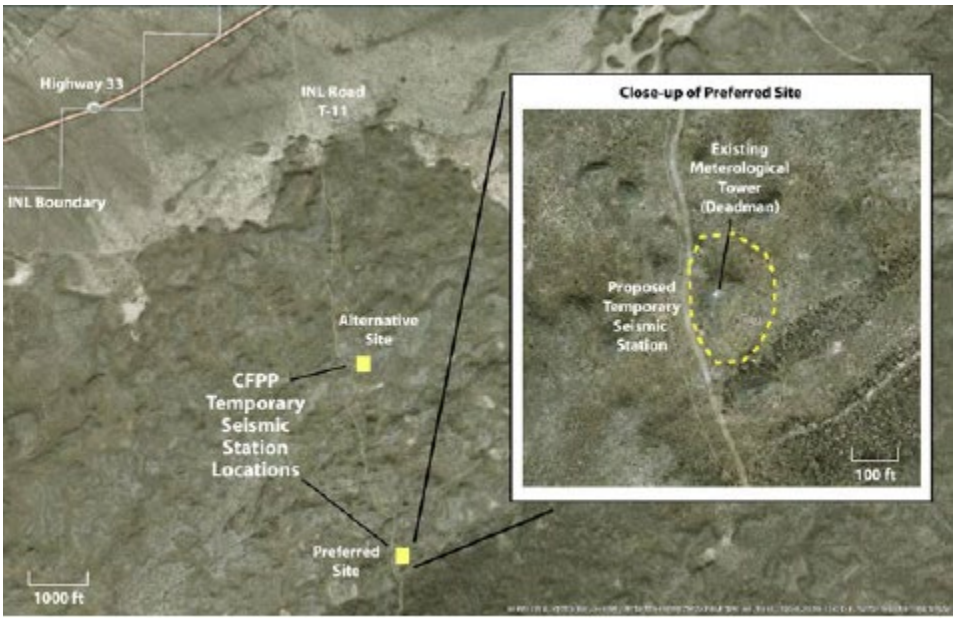
Figure 3. Proposed administrative area for proposed office trailer and support equipment.



Initial site characterization activities also install a temporary seismic station disturbing an area about 50 ft in diameter. Two locations for the temporary seismic station are being considered, with the preferred location near the met tower (Deadman) just off the T-11 road (see Figure 4). The alternative site is located further north just off T-11. Constructing the temporary seismic station includes:

- Hand excavating a 12-inch diameter, 2-ft deep hole to house a three-component seismometer
- Hand excavating a 12-inch diameter, 2-3 ft deep hole to hold a 10 ft long pole (3-inch diameter) for an antenna and solar panel
- A 2 ft x 3 ft metal box placed on the ground near the antenna pole to house batteries, datalogger, and 2.4G digital radio.

Figure 4. Map shows the two locations for a temporary seismic station along INL road T-11.



If the project area is selected for locating an SMR, then additional review under the National Environmental Policy Act (NEPA) is required. Detailed subsurface investigations requiring two deep seismic velocity boreholes would also be needed, which likely involves removing the temporary seismic station and installing a permanent seismic station near one of the seismic velocity boreholes. Converting temporary seismic stations to a permanent one usually requires disturbing an area about 50 ft in radius around the station to complete the following activities:

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UAMPS/TVA plans to conduct spectral analysis of surface waves (SASW) and magnetometer surveys at several CFPP Site Locations (Location 1, 2, & 3) to characterize subsurface geotechnical features. Testing would focus on three possible reactor complex areas and near USGS Well 142/142A (Figure 7). SASW surveys are planned along two lines at each of the three proposed reactor locations and on a single line near USGS 142/142A. The locations of each of the lines are shown on Figure 8, with additional details for the SASW survey lines in Table 1 (see Page 21). SASW testing is a non-destructive/noninvasive method used to estimate the relative stiffness of layered rock or soil materials by generation of surface energy waves from a fixed location and the subsequent measurement of resulting motions perpendicular to the surface created by the passage of surface waves. Measurement points (receiver geophones, Figure 9) in an SASW test are arranged on the ground surface along a single path radiating from the source of the surface wave. Surface waves are generated using a truck-mounted surface wave source in two configurations. An example a field deployed the truck and slab system is in Figure 10. For profiling up to depths of 1,200 feet, the truck source would impact directly on the ground surface at several points along each survey line. To profile to greater depths, a poured concrete slab would be used as a footing/impact point at two points: one adjacent to the T-11 roadway and one adjacent to the T-3 roadway near USGS 142/142A (see Figures 11 and 12). The poured slabs would be about 7-feet long, 10-feet wide, and 1.5-feet high. The surface wave generator truck and support vehicle (carrying geophone equipment) would access and traverse each survey line, as summarized in Figure 8.

Testing would also include pedestrian-based magnetometer surveys of about two square miles of the CFPP Site, which envelops the three potential reactor complex areas (CFPP Site Locations 1, 2, & 3). These surveys may in the future be augmented with unmanned aerial vehicle (UAV) based surveys. Both surveys would use solid-state measurement instrumentation designed to measure variations in the magnitude (and direction) of the Earth's natural magnetic field. These surveys are not expected to result in ground disturbance beyond pedestrian movement and installation of a temporary tripod-mounted basestation/ reference station. Support vehicle movements for the magnetometer surveys would use INL two-track roads (e.g., T-3 and T-11). If flown in the future, UAV fly-over activity would be limited to heights of 100-feet to 150-feet above the ground and would not include image or video acquisition.

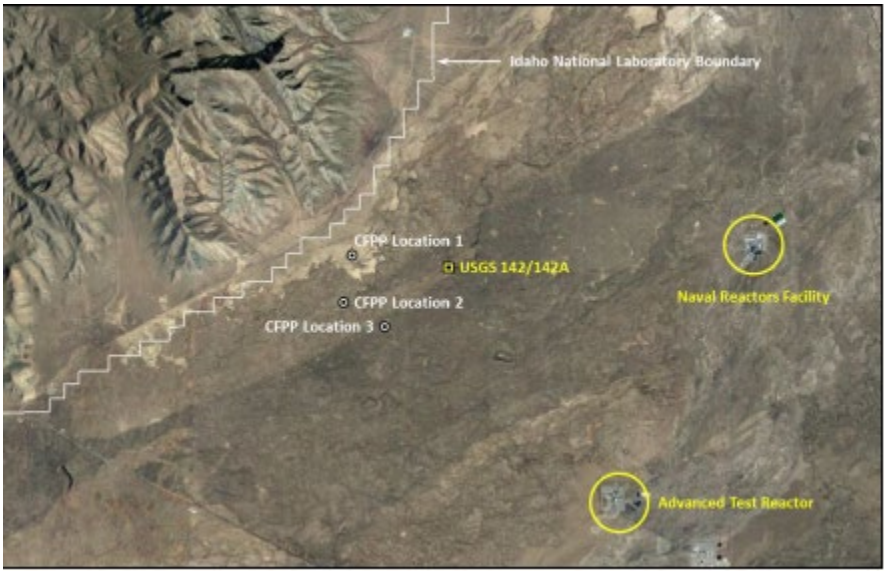

Figure 7. General Project Locations in Relation to INL facilities.

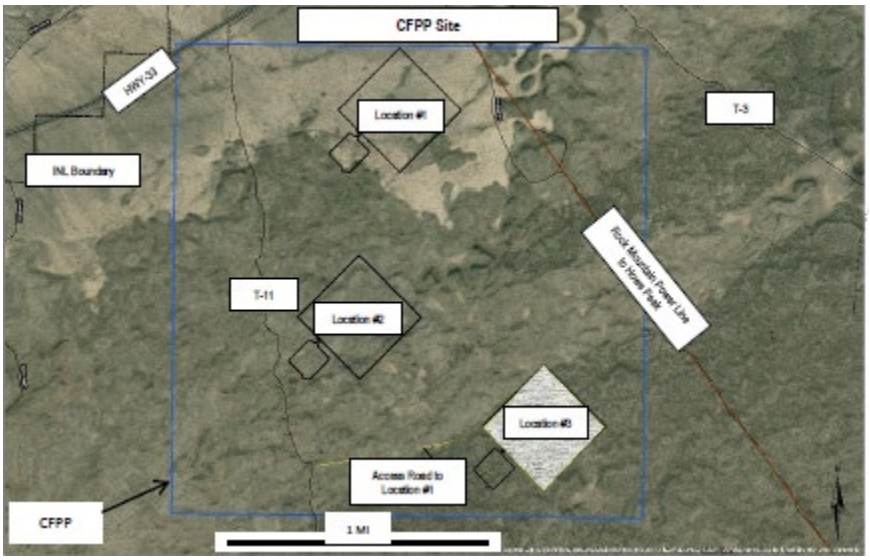

Figure 8. Extent of Potential Disturbance related to SASW survey lines.

Figure 9. Example Geophone Receiver system to be employed during SASW surveys.

Figure 10. Example Field Deployment of the surface wave source system showing A concrete pad and excavations.

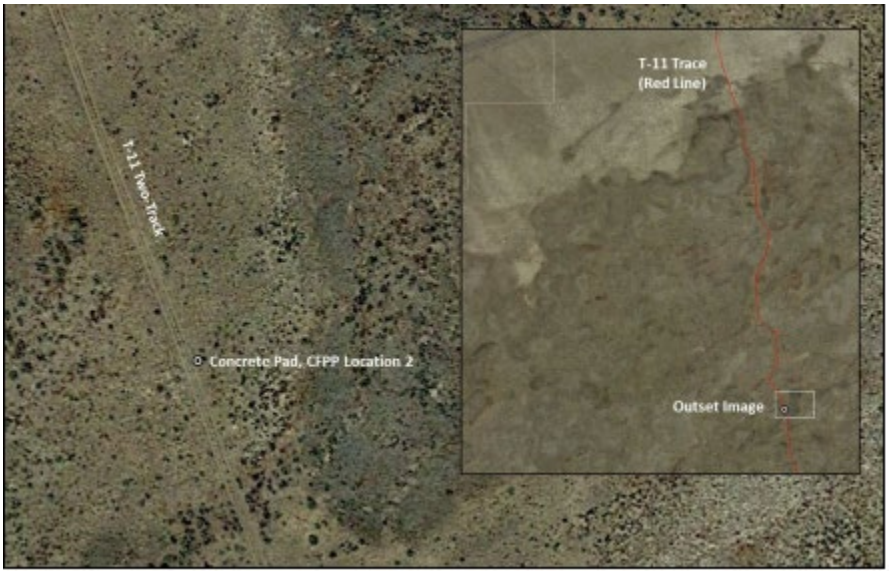

Figure 11. Proposed location of the concrete footing along Road T-11.

Figure 12. Proposed location of the concrete footing along Road T-3.

Table 1. SASW survey line details.

Line [1]	Location [2]	Length [3]	Origin [4]		Mid-Point [5]		Termination [6]	
		(ft)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)	(dd.dddddd)
1A	CFPP Location 1	2,400	43.644036	-113.056798	43.64652	-113.053533	43.648796	-113.050538
1B	CFPP Location 1	2,400	43.648757	-113.056762	43.64652	-113.053533	43.644210	-113.050194
2A	CFPP Location 2	2,400	43.630856	-113.062123	43.635285	-113.056216	43.637947	-113.052664
2B	CFPP Location 2	2,400	43.637638	-113.059606	43.635285	-113.056216	43.633092	-113.053058
3A	CFPP Location 3	3,600	43.626976	-113.045337	43.634402	-113.057394	43.631665	-113.038980
3B	CFPP Location 3	2,400	43.631817	-113.045161	43.629478	-113.041945	43.627158	-113.038757
4	USGS 142/142A	3,600	43.645044	-113.023774	43.642373	-113.018057	43.639702	-113.012337

Notes:

1-See Figure 7.

2-Intended Carbon Free Power Project (CFPP) or other targeted investigation area.

3-Proposed total length of the SASW survey line, in feet (ft).

4-Proposed location (latitude and longitude, in decimal degrees) of the southwestern-most point of a given northeast-southwest trending SASW survey line, or the northwestern-most point of northwest-southeast trending line. Note that the listed origin point for line 2A is also the proposed location for the construction of concrete pad for use in deep profiling.

5-Mid-point location of the of each SASW survey line. For lines 1A and 1B and lines 2A and 2B, the listed mid-point also represents an intersection point for the survey lines.

6-Proposed location of the northeastern-most point of given northeast-southwest trending SASW line, or the southeastern-most point of a given northwest southeast trending survey line. For line 4, the identified termination point is the proposed location for a second concrete pad for use in deep SASW profiling.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

Note: If this project or activity produces or causes air emissions, and it is not stated in this ECP how those emissions caused by this project or activity are exempt, then an APAD is required for documentation. Project activities have the potential to generate fugitive dust. Mobile engine/generator sets used during Phase I activities are exempted from permitting in APAD INL -01-83 R1, Mobile Sources - Nonroad Engines - Generic Coverage for engines less than 294 hp and APAD INL-02-20, Mobile Sources - Nonroad Engines - Generic Coverage for gasoline engines less than 52 hp. A truck mounted coring unit with an air compressor would be used to core the boreholes. Because drilling activities would be conducted several hundred feet below the surface, air pollutants from the boreholes are not anticipated. Emissions from the operations of mobile coring units and other heavy equipment are not regulated as stationary sources. No emission reporting is required.

Discharging to Surface-, Storm-, or Ground Water

Project activities discharge wastewater from well and borehole drilling operations to the ground.

Disturbing Cultural or Biological Resources

A Section 106 review was completed under CRMO project number (BEA-18-37 R7) and resulted in No Historic Properties Affected.

Impacts to biological resources (e.g., vegetation, birds, nests, leks) have the potential to occur during project activities. The CFPP Site is within the SGCA.

Generating and Managing Waste

Project activities have the potential to generate industrial waste such as boxes, wiring, paper, insulation, and some metals (wire, conduit, etc.) and hazardous waste. Industrial waste would be properly managed and disposed. Core drilling activities are expected to generate several hundred cubic feet of rock cuttings and drilling fluid, most of which would enter fractures in the boreholes. Drilling activities would also generate basalt and sediment core, which when no longer needed for project activities would be archived at the INL/USGS Core Storage Library for future studies.

Releasing Contaminants

Chemicals such as hydraulic oil may also be used. Because this project would use petroleum products and possibly other potentially hazardous industrial chemicals, there is the potential for release of small amounts of contaminants into the air, water, or soil. Although not anticipated, there is a potential for spills when using chemicals or fueling equipment. In the even of a spill, notify facility PEL. If the PEL cannot be contacted, report the release to the Spill Notification Team (208-241-6400). Clean up the spill and turn over spill cleanup materials to WGS (waste generator services), or otherwise manage and dispose of the waste in accordance with all applicable federal, state, and local laws, codes, and regulations.

Using, Reusing, and Conserving Natural Resources

Project personnel will use every opportunity to recycle, reuse, and recover materials and divert waste from the landfill when possible.

SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification: Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

References:

B1.24 "Property transfers", B3.1 "Site characterization and environmental monitoring"

Justification:

B1.24 Property transfers. Transfer, lease, disposition, or acquisition of interests in personal property (including, but not limited to, equipment and materials) or real property (including, but not limited to, permanent structures and land), provided that under reasonably foreseeable uses (1) there would be no potential for release of substances at a level, or in a form, that could pose a threat to public health or the environment and (2) the covered actions would not have the potential to cause a significant change in impacts from before the transfer, lease, disposition, or acquisition of interests.

B3.1 Site characterization and environmental monitoring. Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools);Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; Aquifer and underground reservoir response testing; Installation and operation of ambient air monitoring equipment; Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes);Sampling and characterization of water effluents, air emissions, or solid waste streams; Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources);Sampling of flora or fauna; and Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) ☐ Yes ☒ No

Approved by Jason L. Anderson, DOE-ID NEPA Compliance Officer on: 05/16/2023.