APPENDIX A APPLICABLE USFS BEST MANAGEMENT PRACTICES

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The following are selected USFS Best Management Practices (BMPs) that are presumed to be applicable to the proposed Upper Basalt Geothermal Exploration Project.

Erosion Control Plan (PRACTICE: 2-2)

a. Objective: To limit and mitigate erosion and sedimentation through effective planning prior to initiation of construction activities and through effective contract administration during construction.

b. Explanation: Land disturbing activities can result in short term erosion. By effectively planning for erosion control, sedimentation can be controlled or prevented. Within a specified period after award of a contract (presently 60 days prior to the first operating season in Timber Sale Contracts, per C6.3) the purchaser will submit a general plan which, among other things, sets forth erosion control measures. Operations cannot begin until the Forest Service has given written approval of the plan. The plan recognizes the mitigation required in the contract. A similar plan is required of miners and special use permittees.

c. Implementation: Design engineers develop detailed mitigation using an IDT. The detailed mitigations are reflected in the contract specifications and provisions. The intent of mitigation is to prevent construction-generated erosion, as well as that generated from the completed road, from entering watercourses. Contracted projects are implemented by the contractor or operator. Compliance with contract specifications and operating plans is ensured by the COR, ER, or FSR through inspection.

   This practice is commonly applied to all road construction through contract clauses and specifications and will apply to road construction for timber sales, mining, recreation, special uses and other roadwork on NFS lands.

Timing of Construction Activities (PRACTICE: 2-3)

a. Objective To minimize erosion by conducting operations during minimal runoff periods.

b. Explanation: The amount of erosion and sedimentation from road construction are affected by the magnitude of water runoff. An essential element of effective erosion control is to schedule operations during the dry season or when rain and runoff are unlikely. Purchasers will be required to schedule and conduct operations during the dry season or when rain and runoff are unlikely. Purchasers will be required to schedule and conduct operations to minimize erosion and sedimentation. Equipment will not be allowed to operate when ground conditions are such that excessive rutting and soil compaction could result. Such conditions will be identified by the COR or ER with the assistance of an earth scientist or other specialists as needed.

   Erosion control work will be kept as current as practicable on active road construction projects. Construction of drainage facilities and performance of other contract work to control erosion and sedimentation will be required in conjunction with earthwork projects. The operator should limit the amount of area being graded at a site at any one time, and should minimize the time that an area is laid bare. Erosion control work must be kept current when road construction occurs outside of the normal operating season.

c. Implementation: Detailed mitigations developed by design engineers and an IDT will be included in the environmental analysis and in subsequent project plans and contracts.

   Project crew leaders and supervisors will be responsible for implementing force account projects to construction specifications and as specified in the project plan. Contracted projects are implemented by the contractor, or operator. Compliance with plans, specifications, and the operating plan will be achieved by the COR or ER through inspection.

Stabilization of Road Slope Surfaces and Spoil Disposal Areas (PRACTICE: 2-4)

a. Objective: To minimize erosion from exposed cut slopes, fill slopes, and spoil disposal areas.

b. Explanation: This is a preventive practice using bioengineering and other techniques to prevent or minimize erosion. Depending on site factors such as slope angle, soil type, climate, and proximity to waterways, many fill slopes, some cut slopes, and some spoil disposal areas will require vegetative and/or mechanical measures to provide surface soil stability. The level of stabilization effort needed is determined on a case-by-case basis by trained and qualified employees.

   Revegetation includes the seeding of plant species grass, legumes, or browse species--or the planting of brush, or trees. Revegetation may also include fertilizer, soil amendments, and mulching or even watering to ensure success. A combination of plant types with both woody root systems and fibrous root systems usually produce better results than a single plant type such as grass. Native species are preferred and used wherever feasible. Where local native seed is not available, not economically feasible or native plants would be ineffective in controlling erosion sterilized grass or cereal grain seed is applied.

   Mechanical measures may include, but are not limited to: wattles, erosion nets, terraces, side drains, blankets, mats, riprapping, mulch, tackifiers, pavement, soil seals, and windrowing construction slash at the toe of fill slopes.

c. Implementation: Vegetative measures are generally a supplementary device, used to improve the effectiveness of mechanical measures, but can be effective and complete by themselves. They may not take effect for several seasons, depending on the timing of project completion in relation to the growing season.

   Mechanical and vegetative surface stabilization measures will be periodically inspected to determine effectiveness. In some cases, additional work will be needed to ensure that the vegetative and/or mechanical surface stabilization measures continue to function as intended.

   Initial project location, mitigation measures and management requirements are developed during the environmental analysis process. These are translated into project plans, contract provisions and specifications.

   Project road inspectors, and their supervisors monitor work accomplishment and effectiveness, to ensure that design standards, project plan management requirements, and mitigation measures are met.

Servicing and Refueling of Equipment (PRACTICE: 2-12)

a. Objective To prevent pollutants such as fuels, lubricants, bitumens and other harmful materials from being discharged into or near rivers, streams and impoundments, or into natural or man-made channels.

b. Explanation: During servicing and refueling of logging and road construction equipment, any spilled pollutants can be transported by runoff to surface waters. If the volume of fuel exceeds 660 gallons in a single container, or if total storage at a site exceeds 1,320 gallons, project Spill Prevention, Containment and Counter Measures (Spec) plans are required. Contaminated upland soils can be a long-term threat to surface and ground water quality. This threat must be managed by disposing of waste material properly, selecting service and refueling areas well away from wet areas and surface water; by using berms around such sites and by utilizing impermeable liners or other techniques to contain spills according to the Forest SPCC plan.

c. Implementation: The COR, ER, Cl, or TSA are authorized to designate the location, size and allowable uses of service and refueling areas. Operators are required to remove service residues, waste oil and other materials from National Forest land. They must also be prepared to take responsive actions in case of a hazardous substance spill, according to the Forest SPCC plan.

Diversion of Flows Around Construction Sites (PRACTICE: 2-15)

a. Objective: To ensure that all stream diversions are carefully planned, to minimize downstream sedimentation, and to restore stream channels to their natural grade, condition, and alignment as soon as possible.

b. Explanation: Streamflow must be diverted around construction sites such as bridges, culverts and dams. The streamflow will be diverted for all live streams according to the instructions of the ER. The diverted flows are returned to their natural streamcourse as soon as possible after construction or at least prior to the rainy season. All disturbed areas are stabilized prior to the rainy season or as needed.

c. Implementation: This practice is required by contract clauses. The NEPA and design process will identify where diversions are required, and the design will include mitigation necessary to protect instream values and downstream beneficial uses of the water. Planning must include environmental analysis to identify and prevent unacceptable effects to the beneficial uses of the water. The planning process may require project review and/or issuance of permits or certifications by other Federal, State, or local agencies and, where appropriate, private parties. Case by case determinations must be made during project planning as to outservice review and consultation needs. Coordination with California Department of Fish and Game (CDFG) is initiated in most all cases.

   Project location, bypass design, and detailed mitigation will be developed in the design and planning process to meet project criteria. Project crew leaders and supervisors will be responsible for implementing force account projects to construction specifications and to meet project criteria.

   Contracted projects are implemented by the contractor, or operator. Compliance with project criteria, contract specifications and operating plans is enforced by the Cl, COR, ER, or SA.

Snow Removal Controls Io Avoid Resource Damage (PRACTICE: 2-25)

a. Objective: To minimize the impact of snowmelt runoff on road surfaces and embankments and to consequently reduce the probability of sediment production resulting from snow removal operations.

b. Explanation: This is a preventive measure used to protect resources and indirectly to protect water quality. Forest roads are sometimes used throughout the winter for a variety of reasons. For such roads, the following measures are employed to meet the objectives of this practice:

1. The contractor will be responsible for snow removal in a manner, which will protect roads and adjacent resources.

2. Rocking or other special surfacing and drainage measures will be necessary, before the operator is allowed to use the roads.

3. Snow berms will be removed where they result in accumulation or concentration of snowmelt runoff on the road and erosive fill slopes.

4. Snow berms will be installed where such placement will preclude concentration of snowmelt runoff and serve to rapidly dissipate melt water. If the road surface is damaged during snow removal, the purchaser, or contractor will be required to replace lost surface material with similar quality material and repair structures damaged in removal operations as soon as practicable, or unless otherwise agreed to in writing

c. Implementation: Project location and detailed mitigation will be developed by the IDT during the environmental analysis and incorporate into the project plan and/or contracts. Project crew leaders and supervisors will be responsible for implementing force account projects to construction specifications and project criteria. (See also Practice 2-24)

Contracted projects are implemented by the contractor, or operator. Compliance with criteria in the project plan specifications, and the operating plan is ensured by the COR, ER and FSR. Obliteration or Decommissioning of Roads (PRACTICE: 2-26)

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a. Objective: To reduce sediment generated from temporary roads or unneeded system roads by obliterating or decommissioning them at the completion of their intended use.

b. Explanation,: System roads will be identified during transportation planning for decommissioning/obliteration. These roads will be analyzed under the NEPA process for removal from the transportation system or downgraded in maintenance level. Temporary roads are constructed for a specific short-term purpose and other roads will be found to no longer be necessary. For example, ski area development roads and logging spurs on a timber sale. In order to prevent continued low level casual use, such roads will be obliterated at the completion of their intended use. Use of any roads beyond its prescribed time should not be permitted, as the road would be subject to continued, uncorrected damage, and could become a chronic sediment source.

   Effective decommissioning and obliteration is generally achieved through a combination of these measures:

   1 . Road is effectively drained (e.g. waterbars, rolling dips, outsloping and treated to return the road prism to near natural hydrologic function).

   2. Road is effectively blocked to vehicle access.

   3. Crossings are removed and natural drainage restored. (See also Practice 2-16)

   4. Treated surfaces are stabilized through tillage, ripping, fertilization and/or revegetation.

   5. Slideslopes are reshaped and stabilized.

c. Implementation: For timber sales, temporary road closure stabilization and removal of temporary structures are accomplished by the timber purchaser. Compliance with plans and TSC will be enforced by the SA.

   Obliteration or decommissioning of the road to the level that it is blocked to vehicular traffic, culverts and bridges removed, and the roadway stabilized as required by the TSC. Further revegetation needs are addressed in sale area improvement plans to achieve resource production above that required for stabilization of the road bed surface.

   Temporary road location and stabilization measures are determined by the SA by agreement with the purchaser. The SA may request the advice of an earth scientist in determining the most appropriate location for stabilization measures and which measures are required.

   Project crew leaders and supervisors will be responsible for ensuring that other temporary roads, developed by force account, meet construction, specifications and project criteria. Temporary roads on NFS lands that are allowed through special use permits, or easements will be subject to

the same obliteration or decommissioning requirements as temporary roads on timber sales. District Rangers or their representatives will be responsible for assuring the obliteration or decommissioning of such roads is accomplished.