Smoky Canyon Mine
Panels F & G Final EIS

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Chapter 2
Description of Proposed Action and Alternatives

2.1 Introduction

This chapter describes Simplot's existing operations at the Smoky Canyon Mine, the Agency Preferred Alternative, Simplot's Proposed Action, and other Alternatives that were considered and/or eliminated from detailed analysis. The proposed mining operations would consist of several open pits in Panels F and G, topsoil stockpiles, mine equipment-parking areas, access and haul roads, a power line extension, pit backfills, external overburden disposal areas, and runoff/sediment control facilities. Mining activities would include environmental protection practices to reasonably reduce environmental impacts.

Alternatives considered in the EIS are based on issues identified by the BLM and the USFS, and comments received during the public scoping process. Alternatives developed for consideration in this EIS are intended to reduce potential impacts associated with Simplot's Proposed Action. In order to provide the Agencies with flexibility in selecting actions out of the many alternatives, the alternatives were broken down into components. This allows partial approval of proposed actions (such as mining one panel and not the other) or the selection of a number of Alternative Actions. The alternative components are organized in two general groups: mining alternatives and transportation alternatives. The Agency Preferred Alternative, identified in **Section 2.10.2**, is a combination of alternative components.

The Agency Preferred Alternative was identified by the Agencies after comparing predicted environmental impacts associated with all of the Action Alternatives. The agency decision-makers view the Agency Preferred Alternative as being the most reasonably protective of natural resources while allowing extraction of phosphate ore from the Manning (Panel F) and Deer Creek (Panel G) leases.

The reader should focus their attention on the Agency Preferred Alternative (see description in **Section 2.10.2** Agency Preferred Alternative) as this combination of alternative components is more likely to be chosen than Simplot's Proposed Action or other Alternatives analyzed. The Agency Preferred Alternative does incorporate some of Simplot's Proposed Action, and actions common to the alternatives are disclosed and described.

2.2 Project History

2.2.1 Background

Simplot has been involved in phosphate mining in Southeastern Idaho since 1945, originally at the Gay Mine on the Fort Hall Indian Reservation. It acquired Anaconda Company's fertilizer operations at Conda in 1959. In 1984, Simplot began extracting phosphate ore from deposits located on federal land at its Smoky Canyon Mine in eastern Caribou County, Idaho. The operation includes mining with standard open pit techniques in five mine panels (A- E) and then concentrating the phosphate content of the ore in an onsite mill. The concentrate is pumped through a buried pipeline to Simplot's existing fertilizer manufacturing plant (Don Plant) in Pocatello, Idaho. Tailings from the Smoky Canyon milling operation are disposed of in two onsite permitted tailings disposal ponds located on private land owned by Simplot.

2.2.2 Past Environmental Impact Reviews

There have been a number of environmental reviews conducted under NEPA for the Smoky Canyon Mine property and operations.

In 1981, the United States Geological Survey (USGS), then in charge of administering phosphate mining, prepared a Draft EIS (DEIS) for mining at the Smoky Canyon Mine in conjunction with the USFS. The Final EIS (FEIS) and the Record of Decision (ROD) for the approval of the mining operations were completed in 1982 and included approval of the following:

- Open pit mining operations in five panels, A through E;
- Onsite disposal of mine overburden in two main disposal sites external to the pits;
- Construction and operation of a mill and associated power line, water supply wells, and access road;
- Tailings pipeline to the tailings ponds and a return water line;
- Two tailings ponds located east of the mine for disposal of mill tailings;
- Installation of the slurry pipeline to Conda; and
- Reclamation of the facilities upon completion of operations.

The conditional permits granted by the BLM and USFS at the beginning of the Smoky Canyon mining operations required that subsequent, site-specific mine plans for the individual mine phases be submitted to the Agencies for their review and that appropriate mitigation measures be developed using further environmental analysis. These additional mine plans were reviewed with environmental assessments (EAs) that tiered off of the information and analyses included in the 1981 DEIS and 1982 FEIS for the Smoky Canyon Mine. These EAs included:

- EA for Smoky Canyon Mine Tailings Pond 2 (USACE 1990)
- EA for Smoky Canyon Mine Panel A-4 (BLM 1991)
- EA for Smoky Canyon Mine Panel D (BLM and USFS 1992)
- EA for Smoky Canyon Mine Panel E (BLM 1997)

Tailings Pond No. 1 was constructed concurrently with the initial mining and milling facilities in 1984. In 1988, plans were completed for construction of an expansion of the tailings pond within the same area identified within the FEIS. In 1990, an EA was prepared by the USACE for three future phases of Tailings Dam No. 2 and the associated tailings pond to contain all tailings from full development of each of the Panels. In this EA, the USACE reviewed the detailed plans for this facility and developed the plans for environmental impact mitigation. Simplot subsequently completed the wetland mitigation for all three phases of the tailings dam and pond.

The mining of Panels B and C was authorized by a 2002 ROD upon the completion of the Final Smoky Canyon Phosphate Mine Supplemental EIS (SEIS). The SEIS evaluated potential effects on threatened, endangered, and sensitive species as well as effects from selenium and other constituents of potential concern (COPCs) that were not considered in the 1982 Smoky Canyon FEIS.

Exploration in the Deer Creek and Manning Creek lease areas was analyzed over the last several years through the EAs and EIS listed below and additional Documentations of NEPA Adequacy (DNAs), which authorized continued exploration on these properties.

- EA for Manning Exploration for EIS Leasing (BLM and USFS 1994)
- EA for Phosphate Exploration Program for Lease I-01441 (BLM and USFS 1996)
- EA for I-01441 Lease Modification and Exploration Plan (BLM and USFS 1998a)
- Leasing EIS for the Manning and Dairy Syncline Properties (BLM and USFS 1998b)
- EA for Manning Creek Exploration Project (BLM and USFS 2003)
- EA for South Manning Creek Exploration Project (BLM and USFS 2005)

2.3 Existing Operations

2.3.1 Location

The Smoky Canyon Mine is located in Caribou County, Idaho approximately ten air miles west of Afton, Wyoming on the east slope of the Webster Range between Smoky Canyon to the north and South Fork Sage Creek to the south. Access to the mine is gained by traveling west from Afton approximately three miles, then north about four miles toward Auburn to the intersection with the Stump-Tygee Creek Road, then approximately eight miles west and southwest to Smoky Canyon.

Overall, the existing operations extend for a length of approximately 5.9 miles north to south along the east flank of the Webster Range (**Figure 2.3-1**). The mill and administrative and maintenance facilities are located in Smoky Canyon near the northern end of the mining operations. Mine Panel A is immediately east of the mill. Panels B and C are located north of the mill, and Panels D and E are toward the south. The tailings ponds are located about 3.2 miles northeast of the mill site in the Tygee Creek drainage. The mill is connected to the tailings ponds with a pipeline down Smoky Canyon.

Elevations in the Smoky Canyon Mine area range from about 6,600 feet above mean sea level (AMSL) at the tailing pond area to about 8,300 feet AMSL along the ridge of unnamed peaks immediately west of the mine.

2.3.2 Land Ownership

The existing mining and milling operations are contained within 2,600 acres of federal phosphate mineral leases administered by the Pocatello Field Office of the BLM and approximately 1,200 acres of Special Use Authorization's (SUAs) administered by the CTNF. The mining operations are located on Federal Phosphate Leases No. I-012890, I-026843, I-027801, I-27512, and I-30369. The federal land surface is administered by the CTNF, Soda Springs Ranger District. The tailings property encompasses 1,680 acres of private land owned by Simplot. **Table 2.3-1** summarizes surface and mineral ownership.

TABLE 2.3-1 LAND AND MINERAL OWNERSHIP

LEASE NUMBER	SURFACE OWNERSHIP	MINERAL OWNERSHIP
I-012890	U.S. Forest Service	Federal
I-015259	Private (Simplot)	Federal
I-026843	U.S. Forest Service	Federal
I-027801	U.S. Forest Service	Federal
I-30369	U.S. Forest Service	Federal
I-27512	U.S. Forest Service	Federal

2.3.3 Facilities Description

Existing facilities at the Smoky Canyon Mine include an access road, office/shop complex, mill, ore stockpiles, open pits, backfilled pits, external overburden disposal sites, tailings ponds, power lines, tailings pipelines, concentrate slurry pipeline, and ancillary facilities such as runoff control ditches and ponds, storage yards, and "Hot Start" (mine equipment fueling, fuel storage, and parking) areas (**Figure 2.3-1**). The office/shop complex consists of a combination shop and office building. This building houses the office, warehouse, and repair shop facilities. Employee parking, site security office, truck wash bay, tire shop, mill, and emergency generators are also located at the office/shop complex. These facilities would continue to be used during the mining activities described as part of the Proposed Action (**Section 2.4**). Detailed descriptions of the major facilities are as follows:

Security Trailer: Security staff provides around the clock (24 hours per day/7 days a week) coverage of the mine facility. Along with security personnel, this facility houses employee lockers.

Office/Warehouse: This facility houses the offices of mine management personnel and warehouse/purchasing personnel. The offices are located upstairs above the shop and adjacent to the warehouse.

Maintenance Shop/Mill: The maintenance shop houses the maintenance staff that work on company mobile equipment. The mill area is housed in the same building where raw phosphate ore is fed from the outside via front-end loaders. The ore is milled into a fine powder/slurry with water through crushing and grinding operations. The phosphate-containing minerals are beneficiated (separated) from the rest of the rock and then are pumped through the concentrate slurry pipeline to the Don Plant in Pocatello for further processing. The tailings slurry (beneficiation waste) from the mill is gravity fed through the pipeline to the tailings ponds for disposal.

Wash-bay: This area is used for steam washing of company mobile equipment. An oil-water separator system for used-oil recovery is connected to the wash bay.

Figure 2.3-1 2004 Historic and Existing Operations

Figure 2.3-2 Open Pit Mining at Smoky Canyon

Fuel/Used Oil Containment Area: South of the wash bay building and east of the mill (in the yard), are aboveground storage tanks for anti-freeze, diesel fuel (low-sulfur), gasoline (lead-free), used oil, and used anti-freeze. These tanks are located within secondary containment bermed areas lined either with concrete (used oil and antifreeze), or polyethylene (diesel fuel and gasoline).

Tailings Thickener: Once the ore is beneficiated, the non-ore rock slurry is piped to a thickener, located 1/4 mile north of the mill, and sent in a pipeline to the tailings ponds. Water is then recirculated back to the mill via underground return pipelines.

Industrial and Culinary Wells: The industrial well provides fresh water for the mill operations. The culinary and industrial wells provide potable water for mine personnel and are recognized by the State as public drinking water sources. These wells are located approximately 3/4 mile north of the shop, near Smoky Creek.

Hot Starts: The "Hot Starts" is the name given to the staging area for the mobile equipment used in the mining operations. Service islands for maintenance and fueling of a number of vehicles simultaneously, lubing services, and fuel/lube oil tanks (all tanks are protected in a containment area lined with a polyethylene liner) are located here. The Hot Starts are located near the actual mining area for convenience and accessibility. The Hot Starts area is relocated, as needed, to adjust to the mine area location.

Tailings Ponds No. 1 and No. 2: Located approximately 3.2 air miles northeast of the mill area, this area consists of two tailings ponds with associated delivery lines, return lines, and pump houses.

Bone Yard: This is a temporary storage area for large reusable mining equipment, parts, and recyclable materials. Some material located here can be reused in the mining operation. This is not a fixed facility.

Ammonium Nitrate/Fuel Oil (ANFO) Storage: This is a staging area for blasting materials (kept separate from magazines for safety reasons). Ammonium nitrate and emulsion are stored separately, in above ground storage tanks in this area. Ammonium nitrate is not explosive until mixed with the fuel oil. The materials are only mixed when pumped directly into the blast holes. This area is a completely fenced, secured area under video surveillance and equipped with motion detectors. This area is capable of being monitored 24-hours a day through the onsite security office. These surveillance videos are archived for a set amount of time as well.

2.3.4 Mining Operations

The existing mine operations consist of mine Panels A, B, C, D, and E. Each panel consists of one or more open pits and associated external overburden disposal sites. The mining occurs along a southward trending (striking) phosphate deposit that is inclined (dips) to the west. Open pit mining of this deposit continues down-dip until overburden stripping ratios hinder economic operations at which point mining ceases. Mining at Smoky Canyon began with Panel A and proceeded southward through Panels D and E. The extraction phase of mining is currently wrapping up in Panel E and has begun in Panels B and C. As mining progressed southward along the strike of the deposit, the mined out pits have been backfilled with overburden (**Figure 2.3-2**). As of the end of January 2007, the existing panels were backfilled and reclaimed to the following degrees: Panel A – 60 percent, Panels B and C – 0 percent, Panel D

– 100 percent, Panel E – 28 percent. Excess overburden has been disposed of in external overburden disposal sites located east of the mine pits. Inactive areas of the external overburden disposal sites and backfilled pits have been reclaimed with vegetation as specified by the regulatory agencies.

Current operations at the Smoky Canyon Mine include drilling, blasting, loading, and hauling of ore and overburden from Panels E, B, and C using a shovel and truck fleet. Mining proceeds sequentially by opening individual mining pits along the trend (strike length) of the Phosphoria formation outcrop. Mining in Panels B and C is ongoing and is expected to continue until approximately 2007-2008. Reclamation of Panels A, B, and C would be completed in 2009 to 2010. This reclamation occurs concurrently with mining.

The sequential mining of pits along the strike length of the deposit facilitates backfilling open pits with overburden from subsequent pits. When overburden is removed from the ground, it is fractured into particles, which occupy approximately 30 percent more volume than before the rock was mined. This volume expansion is called “swell” and is one reason why all the overburden cannot be returned to the same open pit from which it came even when considering the ore that is removed from the individual pits. Some overburden must be placed in external overburden disposal sites outside of the open pits.

At the end of 2004, the total disturbed area of the existing operations at the Smoky Canyon Mine was 2,150 acres, of which 756 acres had already been reclaimed. Current reclamation plans for the existing Smoky Canyon Mine indicate almost all of the disturbed acreage involved in the mining will eventually be reclaimed. The following description of mining operations applies to the existing operations. Thus, because the Proposed Action would be an extension of the existing mining operations, the following description of mining operations also applies to the Proposed Action.

The mine is operated 24-hours per day throughout the year with crews working overlapping shifts. Hard rock overburden is drilled with blast hole drills. Each blast hole is loaded with a mixture of ANFO. The loaded blast holes are typically detonated 3 to 4 days a week in the afternoon. On average, 400 blast holes are detonated per week. Softer overburden is ripped with dozers. A number of 15- to 27-cubic-yard diesel-powered hydraulic shovels are used to load ore and overburden into off-road type haul trucks.

Ore and overburden are loaded into 150-ton rear dump haul trucks. Depending on the concentration of phosphate mineral in the rock, the trucks deliver the material to one of the mill ore stockpiles, external overburden disposal areas, or previously mined pits as backfill. Water trucks are used to water haul roads, ancillary roads, and the active pit floors to control dust. Roads are also maintained with motor graders. Other equipment used in the operation includes: pickup trucks, vans, service trucks, maintenance trucks, explosives trucks, and other miscellaneous support equipment.

The typical current mining operation in any mining panel complies with the following general mining sequence:

- A detailed Mining and Reclamation Plan for the next phase of mining is prepared and sent to the BLM and USFS for their review. The mining plan is reviewed by BLM mining engineers and geologists to ensure that the mineral resource is being properly

developed. The environmental impacts of the plan are reviewed by BLM and USFS resource specialists who suggest what mitigation is necessary. Appropriate stipulations are decided upon by the Agencies. BLM decides whether or not to approve a Mine and Reclamation Plan (considering input from the USFS), and the USFS decides whether or not to issue any needed Special Use Authorizations for mining activities outside the phosphate lease boundaries.

- The USFS determines the fair value of the timber on the area to be disturbed in the mine plan and issues a timber sale to Simplot, who then pays the USFS the timber sale price. Simplot contracts with another firm for the removal of the timber.
- Small timber roads are built and timber is removed from the proposed disturbance area by a contractor.
- Access and haul roads are built.
- Fencing, berms, or signs are used as necessary to control public motorized access to active mining areas. Non-motorized crossing of mining areas by the public is not controlled unless there is a safety concern.
- Where grazing water sources are affected by mining operations, alternative water sources are provided to grazing permittees in coordination with the USFS.
- Where grazing allotments are affected by active mining operations, grazing access to the affected areas is temporarily controlled with fencing in coordination with the USFS and grazing permit holders.
- Surface runoff management ditches, culverts, settling ponds, and sediment traps are constructed following approved BMPs and information contained in the Smoky Canyon Storm Water Pollution Prevention Plan (SWPPP). The SWPPP was developed in accordance with EPA National Pollution Discharge Elimination System (NPDES) rules and other regulatory input.
- Simplot crews clear the remaining vegetation from the disturbance area on an as-needed basis. After the vegetation is removed, available topsoil is stripped to the stipulated limits and stockpiled in designated locations. This topsoil is sometimes immediately hauled to previous regraded mine disturbances and spread for reclamation. Topsoil stockpiles are graded and seeded to reduce loss of the soil resource by erosion.
- Upper chert overburden (the term “chert” includes cherty limestone and limestone) is removed down to the first ore beds and is hauled away. Hard chert overburden requires blasting in order to facilitate mining. The blasting procedures followed by Simplot are dictated by the Federal Metal and Nonmetallic Mine Safety and Health Standards (30 CFR 56/57/58). The blasting materials used are controlled by the Federal Explosives Law, Regulation of Explosives (Public Law 91-452) through the Bureau of Alcohol, Tobacco, and Firearms Department of the Treasury. The Smoky Canyon Mine is required by law to apply for and periodically renew a permit for the use of high explosives and a license for the manufacture of blasting agents. Only qualified trained personnel have access to or can handle blasting materials as prescribed by federal rules.
- Overburden is typically used to backfill existing open pits. Chert and limestone overburden is also used for road construction and other civil engineering projects at the mine. Some overburden may be disposed of in external overburden disposal sites. The chert typically does not release elevated concentrations of selenium and is currently

used to cover any seleniferous overburden that has been placed in pit backfills or external overburden disposal sites. This was not fully implemented in pre-2000 mining operations but has since been adopted as a management practice for seleniferous overburden. This is possible at Smoky Canyon Mine because the chert sampling/testing has thus far indicated low selenium concentrations.

- Ore from the upper ore zone is removed and hauled to the mill ore stockpile.
- The center waste shale, which lies between the upper and lower ore beds, is removed and hauled to previous open pits for use as backfill or is placed in external overburden disposal sites. Because the middle waste shale is known to contain the highest concentrations of selenium and other COPCs, it is placed deeper in these disposal sites and is covered with chert overburden to isolate it from the surface environment. This was not fully implemented in mining operations prior to 2000 but has since been adopted as a management practice for seleniferous overburden.
- The lower ore zone is removed and hauled to the mill ore stockpile.
- The process of removing upper ore, middle waste, and lower ore is repeated several times within a given pit. Each of these iterations is called a “bench” or “lift”.
- The mined out, open pit is then available for backfilling with overburden from subsequent mining operations in a future pit. When the pit backfill reaches the final grade, reclamation of that area is commenced.
- Reclamation of disturbed areas is an ongoing process, concurrent with mining. At closure, ancillary mine facilities, as well as roads deemed no longer necessary for maintenance access or monitoring, are removed. Road removal incorporates removal of road fills and backfilling road cuts to achieve a final profile similar to the original topography.
- Reclamation of completed mine areas commences with regrading to maximum slopes of 3h:1v. Topsoil is hauled and spread on the regraded area to typical depths of 12 to 36 inches. The topsoil is scarified, fertilized, and seeded with drilling or broadcast methods. Mulch is applied as needed. Tree seedlings are also planted as recommended by USFS foresters.

Each mine panel is divided into a number of separate open pits. The above-described physical mining sequence is repeated in each of the separate pit areas within the panel. All the pits within each panel are designed at the same time and reviewed by the Agencies.

2.3.5 Water Management

Simplot has developed a site-wide SWPPP for surface water resources at the Smoky Canyon Mine in compliance with the NPDES General Storm Water Permit issued by the U.S. EPA. The primary purpose of the SWPPP is to prevent any discharges to surface waters associated with the mine disturbance. The SWPPP provides for control of runoff from mine facilities (removal of sediment prior to dispersed discharge to vegetated areas) and designation of water diversions necessary to accommodate mine facilities. The Mine also carries an NPDES General Construction Storm Water Permit to cover the ongoing expansion of the mine each time a new pit is opened. The SWPPP covers the conditions for both permits and is updated as new disturbance areas are added to the mine operations. The existing SWPPP would be modified as needed to accommodate the new disturbance areas included in the Proposed Action.

The SWPPP is implemented in phases over the life of the Smoky Canyon Mine. Depending on the location of mining activity, the SWPPP describes water diversions (ditches) of ephemeral channels and tributaries to the nearest perennial or intermittent creek. In addition to ephemeral stream diversions, Simplot has constructed stream crossings for the major east-flowing creeks that cross the mine footprint. These are built with corrugated metal culverts placed in the stream channels at the base of road fills. Simplot has installed fish ladders in the Sage Creek culvert to allow for upstream fish migration.

New mine pits and external overburden disposal sites are designed to avoid any direct disturbance of the existing main, east-flowing intermittent or perennial stream channels. This is done by establishing a prescribed buffer zone on either side of these stream channels with no disturbance allowed within this buffer zone.

Storm water catch basins are located throughout the mining area to collect, settle, infiltrate, and evaporate runoff water from land disturbed by the mining operation. These ponds are designed to contain runoff from the contributing watershed area that would be produced in a 100-year, 24-hour storm event (3.0 inches of precipitation). The ponds have engineered outlets to protect the impounding dikes from erosion by discharges. The dikes themselves are constructed to penetrate through permeable alluvial or stream channel deposits to minimize leakage of stored water through such deposits. Outlets from ditches and culverts are protected from erosion with rock riprap, as are some of the steeper ditches. Simplot also uses revegetation and other land reclamation techniques to reduce erosion from disturbed areas.

Haul roads and access roads at the Smoky Canyon Mine site are designed and constructed to provide proper surface drainage. Use of culverts, roadside sediment traps, and berms allows Simplot to control erosion from roadways and subsequent sedimentation. Snow removal from roadways involves placement of snow into areas approved by the agencies where eventual melting will not cause erosion or increase sediment delivery to potential receiving waters.

2.3.6 Mill and Tailings Operations

The following description of the mill and tailings operations is for the existing facilities, which would continue to be used during the mining operations described in the Proposed Action. The existing mill and tailings operations are already in place and fully permitted to accommodate the tailings produced in the Proposed Action and all the Mining Action Alternatives. The mill and tailings facilities are not considered to be connected actions for this EIS because the Proposed Action does not justify or act as a prerequisite for the currently authorized mill and tailings facilities. The Proposed Action also does not trigger any additional mill or tailings pond permitting not already authorized. Existing ponds are located entirely on private lands, off of National Forest lands or any other federal lands. For these reasons, the tailings ponds are not included within the Proposed Action or Alternatives for Panels F and G, however, the environmental impacts for the tailings ponds are evaluated as part of the Cumulative Effects analysis in this EIS.

Ore is fed from the mill stockpile into two hoppers. The hoppers feed a trommel washing system where water is added and the ore is screened, crushed, and then ground to a fine consistency in grinding mills. The ground ore slurry is beneficiated to separate the material with the highest phosphate content (ore concentrate) from the low-grade material (tailings).

The ore concentrate slurry (a 60:40 ore to water ratio by weight) is introduced into a buried eight-inch pipeline. A 1,000 HP pump at Smoky Canyon pumps the concentrate slurry 27 miles to Conda, Idaho, crossing the Webster Range and Dry Ridge. At Conda, two 1,200 HP booster pumps provide additional power to push the slurry another 60 miles, crossing Inman Pass and ending up at the Simplot Don Plant fertilizer manufacturing facility near Pocatello. The slurry is then processed into various grades of both liquid and dry fertilizer. The Simplot ore-slurry pipeline safely transports over 1.5 million tons of phosphate concentrate over the mountainous terrain annually.

The tailings slurry leaving the mill passes through a tailings thickener. The underflow solids from this thickener discharge into the existing tailings line at a maximum rate of 550 gallons per minute (gpm) and 35 percent solids. The clarified water from the thickener is pumped back to the mill at about 3,500 gpm for reuse in the milling operation.

Simplot currently operates two tailings ponds (No. 1 and No. 2) on private property located about 3.2 air miles northeast of the mill. Tailings slurry is discharged in a controlled manner with a system of piping and valves into tailings pond No. 2. As the slurry flows from the discharge points into the Tailings Pond No. 2, they settle out and sink to the bottom. Tailings Pond No. 1 was built at the start up of the mine and is considered full of tailings. Clarified water is collected on top of Tailings Pond No.1 and pumped with high pressure, high volume pumps back to the mill via the underground reclaim water pipeline.

By design, there is no discharge of tailings solids or water from the tailings ponds. Approximately 2,500 gpm of reclaimed water is recycled back to the mill. Additional water is added to the tailings ponds, as needed, from the production well and from Roberts Creek, under existing water rights, in order to maintain the water level in the ponds at the proper operating levels. Depending on production requirements, the Smoky Canyon mill produces approximately 500,000 tons of tailings solids per year.

The tailings ponds were built to be no-discharge facilities under a permit issued by the USACE and IDWR. They are located on private land owned by Simplot in a topographically low area along Tygee Creek. Geotechnical investigations of both tailings pond sites prior to their construction indicated that the entire area of both impoundments is underlain by low-permeability clayey soils that provide control of seepage from the impoundments. The tailings dams were also constructed from these low permeability soils, designed to prevent seepage of tailings water through them. Piezometers in the tailings dams are monitored to ensure that any seepage is detected and controlled before any surface discharge past the dams could occur. Roberts and Tygee Creeks were diverted around the tailings ponds in open channels designed to safely pass the design storm runoff required by the IDWR.

2.3.7 Reclamation Activities and Mine Closure

Reclamation of disturbed areas at the Smoky Canyon Mine is an ongoing process, concurrent with mining and would continue in a similar manner for the Proposed Action. Backfilling is completed by placing the higher selenium concentration overburden in the pit first and capping with chert. The area is rough graded and drainage configurations are established. Topsoil is directly placed from active soil salvaging operations or from nearby stockpiles and spread over the graded surface. Topsoil is spread to a thickness of one to three feet. The seedbed is prepared by fine grading followed by placement of fertilizer and seed. Revegetation is implemented when mine activities in an area are completed. The detailed planning for each phase of mining has been separately reviewed by the BLM and USFS and different revegetation practices and seed mixes have been specified at different points of time by the Agencies, which incorporate lessons learned at the Smoky Canyon Mine and other phosphate mines. In addition to erosion protection, reclamation is intended to meet the final CTNF multiple land use goals of wildlife habitat, recreation, hunting, and grazing. An example of the overall reclamation process is shown in **Figure 2.3-2**.

The mine facilities are temporary and will be decommissioned upon mine closure. At closure, ancillary mine facilities, as well as all roads deemed no longer necessary for reclamation maintenance access, monitoring of the closed and reclaimed mining operations, or public access consistent with USFS management plans, would be obliterated and reclaimed when no longer needed for the purpose of the lease. Offices, buildings, shops, mill facilities, and utilities would be removed. The sites of these facilities would then be regraded and revegetated.

Public motorized access to reclaimed mine areas is controlled until the reclamation is deemed successful by the BLM and USFS. Public motorized access to reclaimed areas is then re-established in concurrence with USFS management plans. Public non-motorized access to reclaimed areas is not restricted.

Grazing of reclaimed areas is restricted until the reclamation is deemed successful by the BLM and USFS, and it is determined that grazing can be re-established on the reclaimed areas.

The tailings ponds have been designed to remain upon abandonment and closure after the tailings storage volume is filled. At that time, the reclaimed water pumping facilities would be removed. The proposed closure plan, filed with the IDWR and conditionally approved on March 28, 2005, indicates that an overflow spillway would be excavated into one abutment of both tailings dams (NewFields 2005a). These spillways would be designed to pass the peak flow from a 100-year, 24-hour storm event. The peak flow was calculated from the entire 8.6-square mile watershed directly upgradient of the tailings dams. The spillway for Tailings Dam No. 1 would discharge to the Tailings Pond No. 2. The spillway for Tailings Dam No. 2 would be connected to the Tygee Creek diversion channel downstream of the dam. The spillways would be designed to be open channels with bottom widths 30 to 35-feet wide, 3h:1v side slopes, and 5-foot depths.

The existing Roberts Creek/Tygee Creek diversion channel was designed to safely carry runoff from a 100-year, 24-hour storm event around both tailings impoundments and route the flow to Tygee Creek below Tailings Dam No.2. It is proposed that the channel be left in place after reclamation of the tailings facility to handle normal runoff flows from the watershed above the tailings facility. A second diversion channel is proposed to be constructed along the north side of the Tailings Pond No. 2 to further reduce run-on into the tailings impoundment area after

reclamation. This also is designed to safely pass the peak flow from the 100-year, 24-hour storm event.

The tailings impoundments would be allowed time to dry out to the maximum extent feasible. The grades of the final tailings solids surface will depend on the total tailings deposited in the impoundments, the pattern of deposition, and the amount of water stored in the impoundments. It is intended that the final grades on the dried tailings would be toward the spillways so the tailings areas would not impound water. The finished tailings surface would be amended with organic materials to reduce plant uptake of selenium and revegetated by broadcasting or drilling seed. At this time, soil cover is not considered essential for reclamation success. The seed chosen for reclamation would be selected in concert with the regulatory agencies to provide perennial cover and to reduce biological uptake of selenium and other contaminants from the tailings. Fertilizer and mulch may be used to enhance revegetation success. Studies are underway to determine the most effective approach for revegetating the tailings and minimizing the uptake of selenium by plants used for revegetation. Annual inspections and maintenance of the reclamation would continue for five years after completion of closure. Institutional controls on grazing have already been implemented for the tailings facility, and other controls as necessary would be determined at the time of final closure.

Actual cost bonding by Simplot for the existing Smoky Canyon Mine is approximately $8,600,000 for the eventual reclamation of the existing and permitted mine operations. This amount is an estimate of the actual cost for the state and federal governments to close and reclaim the currently approved facilities at the mine in the event Simplot abandoned operations before completing reclamation. This amount does not yet include any of the proposed disturbance related to Panels F and G. A reclamation cost estimate has been prepared for the proposed new disturbance and is discussed in **Section 2.10.3.** If the Project is authorized, the Agencies would adjust the current bond amount accordingly before allowing ground disturbing activities. Based upon the anticipated land disturbance, bond calculations are reviewed yearly at the BLM Pocatello Field Office, and the bond amounts are adjusted as necessary. Simplot must complete reclamation of federal lands at the mine according to provisions in approved reclamation plan and Forest Service standards.. As reclaimed areas are approved for release by the BLM and CTNF, a lower bond amount for these areas may be requested by Simplot.

2.3.8 Hazardous Materials

The Smoky Canyon Mine operations comply with both state and federal hazardous materials regulations and would continue to do so during the Proposed Action. The term “hazardous materials” is defined in 49 CFR 172.101 (U.S. Department of Transportation (DOT) regulations governing transportation of hazardous materials). The principal hazardous materials that are transported, stored, or used at the Smoky Canyon Mine are summarized in **Table 2.3-2**.

The primary route for transporting hazardous materials to the mine is via U.S. Interstate Highway 15 and U.S. Highway 30 to Soda Springs. From Soda Springs, the principal hauling routes are U.S. Highway 30 to U.S. Highway 89 to Afton, Wyoming. An alternate route is from Interstate Highway 80 at Evanston or Little America, Wyoming to Highway 30 to Border and then Highway 89 to Afton. Another alternate route is Interstate 15 to Idaho Falls and then Highway 26 to Alpine and then south on Highway 89 to Afton. From Afton, access to the site is via the Afton to Auburn road to the Stump-Tygee Road to the Smoky Canyon Road. Transportation of hazardous materials is not allowed across the CTNF via the Blackfoot Narrows, Diamond Creek, or Georgetown Canyon roads. U.S. DOT-regulated transporters are

used for shipping regulated hazardous materials. Hazardous materials are stored at designated locations onsite in tanks or DOT-approved containers. Spill containment structures are provided as appropriate for all liquid hazardous materials.

2.3.9 Petroleum Management

Simplot has implemented a Spill Prevention Control and Countermeasures Plan (SPCC) (Simplot 2000) for managing aboveground petroleum product tanks and vessels and potential spills, in accordance with the Clean Water Act (40 CFR Part 112). The plan describes types of containment structures at the facility to prevent petroleum products from reaching surface water and groundwater receptors and the procedures to be followed in the event of a spill or release.

The plan is amended when there is a change in facility design, construction, operation, or maintenance that materially affects the potential for a release of oil or other petroleum products into the environment. The SPCC Plan would be amended as required to accommodate the petroleum storage facilities that are part of the Proposed Action.

All liquid petroleum products and antifreeze are stored in aboveground containers as described in **Table 2.3-2**. The bulk storage areas are bermed and lined to contain spills. All bermed containment areas are of sufficient capacity to hold the entire contents of the largest tank and allow sufficient freeboard for precipitation. The shop building provides containment for all tanks located in that structure. The SPCC Plan states that tanks, pumps, and pipelines will be visually inspected for leaks. Inspections are conducted and recorded on a routine basis by mine personnel. The SPCC Plan also requires that Simplot's operating and maintenance personnel be trained in the proper use and maintenance of all equipment containing petroleum products. The training is necessary to educate employees as to environmental consequences, thus minimizing the chance of a spill due to operator error. Any petroleum-contaminated soil is treated onsite at a land-farm.

2.3.10 Hazardous Waste

Hazardous waste is regulated under the Federal Resource Conservation and Recovery Act (RCRA) regulations (40 CFR Part 260 et. seq.). Generators of hazardous waste must follow strict rules regarding the generation, storage, handling, and disposal of their wastes. The Smoky Canyon Mine is considered a *Conditionally Exempt Small Quantity Generator* because it generates less than 100 kilograms of hazardous waste per month. These wastes are generated and temporarily stored at the mill and mine maintenance shops. The only specific hazardous waste generated at the facility is paint-related waste including waste paint and thinner (Waste Code D001). The off-site disposal facility for this waste is a permitted hazardous waste incinerator. The existing hazardous waste status for the mine is not anticipated to change for the Proposed Action.

The mine complies with applicable state and federal hazardous waste regulations. All hazardous wastes are accumulated and shipped in proper containers that are normally closed except when wastes are added or removed. These containers are properly labeled and marked according to the hazardous waste and U.S. DOT hazardous materials transportation regulations. Employees at the mine are trained to properly handle and dispose of hazardous wastes in accordance with mine procedures.

TABLE 2.3-2 HAZARDOUS MATERIALS MANAGEMENT, SIMPLOT SMOKY CANYON PROJECT

SUBSTANCE	AREA USED/ STORED	ANNUAL RATE OF USE (GALLONS)	ONSITE STORAGE CAPACITY	STORAGE METHOD	SHIPMENT QUANTITIES (GALLONS)
Diesel (Hi & Lo Sulfur)	Yard Stockpile Hot Start	3,000,000	(1) 10,300 gallon tank (1) 7,400 gallon tank (1) 50,000 gallon tank (1) 11,700 gallon tank	Above-ground bulk tanks	10,000
Gasoline	Yard	48,000	(1) 10,000 gallon tank	Above-ground bulk tank	10,000
10W Oil 15-40W Oil HD 30W 50W Oil 5-30W Oil Used Oil 80-90W Oil 10W Oil 15W-40 Oil ATF 50W TO4 40W Oil 40W TO4 40W Oil 30W Oil 10W Oil 15W-40 Oil Used Oil	Shop Yard Hot Start	100,000	(1) 4,000 gallon tank (1) 2,000 gallon tank (1) 2,000 gallon tank (1) 2,000 gallon tank (1) 300 gallon tank (1) 10,000 gallon tank (1) 500 gallon tank (1) 7,800 gallon tank (1) 7,800 gallon tank (1) 500 gallon tank (1) 2,300 gallon tank (1) 2,100 gallon tank (1) 3,000 gallon tank (1) 500 gallon tank (1) 500 gallon tank (1) 500 gallon tank (1) 500 gallon tank (1) 8,500 gallon tank	Above-ground bulk tanks	2,000
Antifreeze Used Coolant Antifreeze	Yard Hot Start		(2) 500 gallon tanks (1) 5,000 gallon tank (1) 300 gallon tank	Above-ground bulk tanks	2,000

2.3.11 Safety

The Smoky Canyon Mine is subject to the Federal Mine Safety and Health Act of 1977 (MSHA), which sets mandatory safety and health standards for surface metal and nonmetal mines, including open-pit operations. The purpose of these standards is the protection of life, promotion of health and safety, and prevention of accidents. Regulations promulgated under MSHA are codified under 30 CFR.

Simplot maintains site-specific safety procedures and policies. These include procedures for operating equipment, requirements for wearing personal protective equipment, lockout-tagout procedures, fire suppression, housekeeping, proper use and storage of explosives, first aid, hazardous materials handling, and other operation or production related health and safety scenarios.

Shipping and receiving personnel and the facility health and safety coordinator receive applicable training in handling and care of hazardous materials in accordance with the DOT regulations (40 CFR 172.704). Simplot personnel also receive hazard communication and recognition training in accordance with the MSHA regulations.

The safety procedures and policies for the mine would also apply to the operations included in the Proposed Action.

2.3.12 CERCLA Studies and Remediation

Beginning in 1996, livestock deaths associated with selenium poisoning were identified at phosphate mines other than Smoky Canyon Mine in Southeastern Idaho and prompted response by the regulatory agencies, the phosphate mining members of the Idaho Mining Association, tribal agencies, and other stakeholders. In 2000 many of these parties entered into an Area-Wide Administrative Order on Consent (Area-Wide AOC) to further evaluate and address area-wide and site-specific human health and ecological risks related to past phosphate mining in Southeastern Idaho. Signatory agencies involved in the Area-Wide AOC include IDEQ, BLM, FS, EPA, and BIA. This agreement also included a process for separate AOCs at specific mining properties that would describe the approach to conducting site investigations (SI) and Engineering Evaluations/Cost Analyses (EE/CA) that would lead to removal actions necessary to lead to remediation of environmental contamination from existing mining disturbances.

Simplot entered into AOCs for the Smoky Canyon Mine with federal and state agencies. The Area A AOC included all areas of the mining operations on public land except the tailings impoundments, ongoing mining at Panel E, and recently permitted mining at Panels B and C including backfilling Panel A. The Area B AOC included the tailings impoundments on private land.

The SI for the Area A was completed in July 2005 and includes descriptions of the mining operations, their apparent environmental impacts on surface and subsurface environmental resources through release of hazardous substances, fate and transport of these substances, and the human health and environmental risk associated with the releases (NewFields 2005b). The EE/CA for the Area A was completed in May 2006 and included: a review of the screening criteria and provided goals and objectives for removal actions; summary of SI findings; technical information supporting identification and development of removal action alternatives; identification of removal action alternatives including options that were screened out of consideration; detailed analyses of the removal action alternatives under consideration; comparative analysis of alternatives, and; recommendations for removal actions that are applicable at the site. More information on the agency preferred removal action for the Pole Canyon cross-valley overburden disposal area to reduce selenium concentrations in Pole Canyon Creek and Hoopes Spring, the schedule for its implementation, and its anticipated effectiveness for reducing existing contamination is contained in **Appendix 2A**. A separate report is also included in **Appendix 2A** regarding the reclamation and other actions proposed for the Panel E operations to reduce selenium concentrations at South Fork Sage Creek Spring.

2.3.13 Relation to the Proposed Project

The current Smoky Canyon Mine operations and facilities provide the infrastructure needed for mining the proposed Panels F and G. As described above, all necessary facilities, utilities, equipment, staff, and procedures are already in place to recover the phosphate ore reserves in the proposed mine expansion into Panels F and G. The ore in the proposed panels is readily accessible to the existing operations through the extension of the existing haul/access road system toward the south along the trend of the ore bodies. Mining would be conducted in a similar fashion to the existing mining incorporating the environmental controls as described in **Section 2.5**. Ore would be hauled from the new mine panels to the existing Smoky Canyon mill for beneficiation. Tailings would be disposed in the existing tailings pond and ore concentrate would be transported to the Simplot fertilizer plant in Pocatello with the existing slurry pipeline system. Access to the proposed operations for personnel and supplies would be through the existing Smoky Canyon facilities.

2.4 Proposed Action

Overview

The Proposed Action would consist of issuing a lease modification and approving a mine plan to develop two new mine panels, Panels F and G (sometimes referred to as Manning Creek and Deer Creek leases or tracts, respectively), and authorizing topsoil stockpiles, mine equipment parking and service areas, access and haul roads (Panel F Access/Haul Road and Panel G West Access/Haul Road on **Figure 2.4-1**), a 25kV power line extension from the existing Smoky Canyon loop, permanent external overburden storage areas, and runoff/sediment control facilities. All of the mining activities under the Proposed Action would be located on federal leases and land administered by the BLM and USFS, respectively. The proposed mining would occur in existing Federal phosphate leases No. I-27512 and I-01441 held by Simplot.

Simplot has also proposed to modify (expand) lease I-27512 on its north and south ends to accommodate mining in currently unleased federal land for Panel F (**Figure 2.4-1**). The North Lease Modification would allow mining of phosphate ore to the lowest elevation possible at the north end of Panel F through construction of a haul/access road entering the panel on its north boundary. If this ore were not recovered as part of the overall Panel F operation, it would not be recoverable as a separate, future mining operation. The South Lease Modification would allow mining of phosphate ore that exists from the existing south boundary of the Manning Lease to approximately the south outcrop limit of the ore. This ore would be recovered as part of the overall Panel F operation and would not be recoverable as a separate, future mining operation. Special use authorizations would be needed from the CTNF for required mine-associated uses and surface disturbances outside of BLM administered lease boundaries.

If approved, mining is proposed to begin in Panel F in 2007-2008, toward the end of mining in the existing Panel B. The blending of ore from Panels F and B would allow for maximizing ore recovery in Panel B. At full ore production rate, the mine life of Panel F, including both lease modifications, would be about 7 years. If the lease modifications were not approved, mining in Panel F would be completed in about 4.5 years. Mining in Panel G would take between 6 and 8 years, at full ore production rate. Concurrent reclamation work is proposed and would continue for approximately 2 years following completion of mining in each panel. The conceptual time line for the Proposed Action is shown in **Table 2.4-1**. The actual time line for the proposed

mining operations could be different than shown due to a number of factors including: mining technology, markets and economic constraints, company planning, natural site conditions, and government approvals.

TABLE 2.4-1 ESTIMATED CONCEPTUAL TIMELINE FOR PANELS F & G PROPOSED ACTION

ACTIVITY	START (MO)	DURATION (MO)	END (MO)
Start Project	0	0	0
Initial Timber Removal Panel F	1	3	4
Panel F Haul/Access Rd Construction	1	4	5
Mining in Panel F	6	76	82
Reclamation in Panel F	24	76	100
Initial Timber Removal Panel G	70	3	73
Panel G Haul/Access Rd & Power Line Construction	66	12	78
Mining in Panel G	78	96	174
Reclamation in Panel G	96	96	192
Reclamation of Panels F and G Haul/Access Roads	180	12	192

The proposed mine panels would be operated 24-hours per day throughout the year with crews working overlapping shifts. Hard (chert and limestone) overburden would be drilled with a blast hole drill. The blast holes would be loaded with a mixture of ammonium nitrate and fuel oil (ANFO) and then typically detonated once every two to three days. Blasting would take place during daytime hours only. Softer (shale) overburden would be ripped with tracked dozers. Excavators would load ore and overburden into off-road-type haul trucks at the active mining face in the pits. Ore and overburden would be loaded into 150-ton rear dump haul trucks. Depending on the concentration of phosphate mineral in the rock, the trucks would deliver the material to the mill ore stockpile, external overburden disposal areas, or previously mined pits as backfill.

Water trucks would be used to water haul roads, ancillary roads, and the pit floors as needed to control dust. Roads would also be maintained with road graders. Other equipment used in the operation would include: pickup trucks, service trucks, maintenance trucks, explosives trucks, and other miscellaneous support equipment. The mining operations proposed for Panels F and G would include the general mining sequence described in **Section 2.3.4**.

Haul/Access Roads

Initially under the Proposed Action, a new haul/access road would be constructed from the existing roads in the south end of Panel E approximately 2.5 miles to the proposed Panel F (Panel F Haul/Access Road) (**Figure 2.4-1**). Before operations begin in Panel G, another haul road (Panel G West Haul/Access Road on **Figure 2.4-1**) would be built to transport ore from the southwestern end of Panel G to Panel F where it would join the haul road in that panel. Portions of these necessary roads would be constructed within USFS IRAs outside of the existing Simplot leases. These roads would be used for general mine access from the existing Smoky Canyon Mine and to haul ore and overburden in 150-ton haul trucks. A typical cross section of these roads is shown in **Figure 2.4-2**. During road construction, topsoil would be removed from the disturbance area and stockpiled in windrows along the margins of the

disturbance area and in discrete topsoil piles as shown on **Figure 2.4-1**. Cut slopes along the haul/access roads would vary to a maximum slope of 1h:1v. Fill slopes would be constructed at the angle of repose, approximately 1.5h:1v. The total disturbance width of the haul/access roads would vary from about 100 to 500 feet. The road disturbance statistics are shown in **Table 2.4-2**.

TABLE 2.4-2 PROPOSED ACTION HAUL/ACCESS ROAD DISTURBANCE

FEATURE	PANEL F HAUL/ ACCESS ROAD	PANEL G WEST HAUL/ ACCESS ROAD
Total Length (driving miles)	2.6	7.8
Total Disturbance (acres, outside of pits)	66.5	217.3
Acres on Lease	5.1	20.6
Acres off Lease	61.4	196.72
Acres Outside of IRAs	42.3	117.7
Total Acres in IRAs	24.2	99.6
Acres in IRAs off Lease	19.2	96.4

Note: Includes all disturbance in the road corridor including cut and fill slopes, and topsoil stockpiles.

Plans for construction of the Panel F Haul/Access Road include the use of low selenium overburden and material from road cuts. The maximum road grade would be 9.5 percent, as dictated by Simplot's safety policy concerning maximum ascent/descent grade of a loaded haul truck. A crossing is proposed at the intermittent channel of South Fork Sage Creek with a circular culvert approximately 230 feet long. This and other stream crossings by haul/access roads in areas of known fish and amphibian habitat would be designed with circular culverts placed to pass fish and amphibians in accordance with CTNF requirements. The selection of circular culverts for this Project followed an evaluation of stream crossing designs for fish passage based on available literature and monitoring data obtained from the existing Sage Creek haul/access road culvert at the Smoky Canyon Mine (**Appendix 2B**).

Design, construction, operation, and reclamation of the haul/access roads planned for the Panels F and G Project would be in accordance with applicable State and federal requirements for protection of water quality. Detailed designs for the haul/access roads that are eventually selected by the Agencies would be provided by Simplot for review and approval before construction. To support the environmental analyses in this EIS, Simplot provided the Agencies with the Haul and Access Roads Environmental Commitments and BMPs document included in **Appendix 2C**.

The Panel F Haul/Access Road would cross and cut off the existing Forest System road in South Fork Sage Creek Canyon for the duration of the Proposed Action. This haul/access road would be used for mine personnel access and hauling ore from Panel F to the existing mill stockpile, approximately 4.6 miles to the north. This road crosses USFS land outside of the existing Panel F lease boundary and enters the north end of the Panel F lease at a specific location to allow ore extraction down to this elevation. Initially, the primary Panel F Haul/Access road would be constructed to access the upper portions of Pit 1 and subsequently all of Pits 2, 3, and 4. This road would remain in place for the entire life of the mine. As mining proceeds and Pit 1 deepens, additional temporary access roads would be constructed further to the north and down slope. Each temporary access road would allow access to successively lower portions of the deposit. As each temporary road is constructed, the previous higher road would be obliterated.

Figure 2.4-1 Proposed Action Ultimate Pit Map

Figure 2.4-2 Typical Haul/Access Road

These temporary access roads are needed to mine Pit 1 to its maximum depth and would only be in use for about 1 year. As mining progresses to Pit 2, the temporary roads would no longer be needed. **Figure 2.4-1** shows the primary road alignment and the successive construction of temporary roads at lower elevations.

This haul/access road could be authorized with approval of a USFS SUA, or with the combination of the North Lease Modification and a SUA. It is expected that the primary Panel F Haul/Access road and the temporary roads would cross exposures of phosphate ore. The North Lease Modification would permit the recovery of ore where it is encountered in the construction process. No additional disturbance would be required for recovery of this ore. Without the North Lease Modification the ore encountered in road construction off lease would not be recovered.

As Panel F is developed from north to south, the primary haul road would be extended approximately 2.6 miles to the south end of the panel.

Construction of the Panel G West Haul/Access Road is planned to provide access from Panel F to Panel G. It too would be built of low selenium overburden and material from road cuts. Where it crosses Meade Peak Shale, seleniferous shale excavated in full-face road cuts would be hauled to overburden fills at the mine panels. No seleniferous shale would be used in road fills. The road would be constructed west from Panel F along an existing, reclaimed timber sale road corridor on the south slope of South Fork Sage Creek Canyon to the Sage Meadow area. From this point, the road would be built over a pass to the east side of the summit between Deer Creek (to the south) and Diamond Creek (to the north). From this point, it would be routed south on the east side of Deer Creek to South Fork Deer Creek. It would cross the perennial Deer Creek and South Fork Deer Creek with culverts that are 280 and 260 feet long, respectively (refer to **Figure 2.4-1**). The haul road would also cross the existing USFS road approximately at the same point it crosses South Fork Deer Creek. The haul/access road would then be routed east in the South Fork Deer Creek Canyon uphill (south) of the existing USFS road in this canyon and cross the USFS road approximately at the Panel G staging area. Due to safety concerns, the Panel G West Haul/Access road would be restricted to mine traffic only. Sections of this road would fall within the existing Conda Partnership Phosphate Lease I-07942 and accommodations would be made by Simplot with the lease owners for any ore grade material excavated during construction of this road.

Where the haul road crosses the existing USFS access road near the Georgetown turnoff the routes would cross at grade. There may be temporary road closures in order to place and grade material during construction, but it is anticipated that this would normally be a matter of hours or at the most, a day or two. Signs, road cones, barriers, and construction personnel would be used to warn and redirect traffic during these construction-period road closures. Once the “at grade” intersection is completed, warning signs would alert drivers of the haul truck traffic and direct them not to turn onto the haul road but to proceed with caution across the haul road. Haul trucks would have the right of way at these crossings.

The existing USFS access road across the planned staging area, located southwest of the proposed Panel G pit, would also have to be rerouted. The depth of the access road chert cover over the existing topography at this location would be 50 feet or less. This rerouting of the USFS access road can be completed and in place prior to the staging pad construction. There may be temporary road closures in order to place and grade material during construction, but it

is anticipated that this would normally be a matter of hours or at the most, a day or two. Signs, road cones, barriers, and construction personnel would be used to warn and redirect traffic during these construction period road closures. During the placement of overburden fill material for the completion of the staging area, berms would be in place on either side of the USFS access road to keep vehicles of the general public from straying into the active mine site area. Signs would be posted along this portion of the access road reroute to indicate that this is an active mine area and that no stopping or parking would be allowed. The berms along the rerouted USFS road would also be high enough to keep the haul trucks from entering the USFS public access road. The haul trucks would only be able to cross the USFS public access route within the staging area at one point. This point would be a gated, attendant-operated crossing, whose purpose would be to stop the general public momentarily in order to allow mine traffic to access either side of the staging area.

During construction of the haul/access roads, topsoil would be stockpiled in windrows along the uphill edge of the road disturbance or in discrete topsoil stockpiles. These additional disturbances have been included in the overall acreages shown for the haul/access roads in this EIS.

Facilities

The existing Smoky Canyon Mine maintenance, administrative, and milling facilities would continue to be used for the Proposed Action. However, because Panels F and G lie several miles south of the current maintenance and fuel facilities, proposed new mine support facilities at the new panels would include: equipment ready lines, electrical substations, warehouse and storage areas, lunch rooms, repair shops, restrooms, fuel and lubricant storage and dispensing facilities (hot starts), and blasting supplies storage. These facilities would be temporary in nature. They would be removed following mining and appropriately reclaimed.

Water for dust control for the Panel F operations would be hauled from the existing source at the Smoky Canyon Mill. Because of the longer distance to Panel G, a water supply well with an annual average pumping rate of 100 gpm would be installed at the facilities area to supply water necessary for mining operations.

Electric power for the proposed mining operations would be provided with a 25kV power line extending southward from the existing power system in Panel E across South Fork Sage Creek Canyon through Panel F along the western edge of the proposed pit limits. The power line would then cross the North Fork and Main Fork of Deer Creek into the southwestern portion of Panel G (**Figure 2.4-1**). The total length of this new power line from Panel E to Panel G would be approximately 6 miles, of which about 4.6 miles would cross undisturbed areas, and the rest would be within the mine panel disturbance. The power line would consist of approximately 30-foot tall, single wooden poles with an average conductor span of approximately 330 feet. Approximately 16 structures per mile would be needed. All creeks would be spanned and a 50-foot wide corridor (25 feet on either side of the center of the power line) would be maintained in order to prevent trees from falling on the line. Any cut down trees would be left in place. A helicopter would be used to install all power poles situated off existing lease areas under a SUA issued by the USFS. All pole holes off lease would be dug by hand or with the aid of airlifted equipment. A total of four conductors would be installed on the poles and cross arms. Staging and pulling stations would only be situated on existing lease areas. The 50-foot wide corridor would result in a maximum corridor footprint total of approximately 28 acres, although actual ground surface disturbance from installation of the line would be much less. Assuming a 25-foot radius circular area of temporary surface disturbance around each pole location, actual surface

disturbance for the approximately 4.6 mile line located outside of the Panel F and G mine disturbance areas would total approximately 3.0 acres of new surface disturbance (74 poles).

Pits and Overburden

The development of the full Panels F and G (including both lease modifications for Panel F) would require removal and handling of over 100 million (MM) in-place or Bank Cubic Yards (BCY) of overburden. Of this total, 89 percent would be used to backfill the mined out Panels E, F, and G pits, and 11 percent would be placed external to the pits.

Salvageable topsoil would be removed from the proposed mine disturbance areas and temporarily placed in stockpiles shown on **Figure 2.4-1** or immediately moved to previous, mined-out areas that have been regraded and are ready to receive topsoil for reclamation.

Simplot designed the two large topsoil stockpiles for Panels F and G to occupy topographically suitable locations where the topsoil could be temporarily stored in a stable condition and then economically retrieved for reclamation purposes (**Figure 2.4-1**). Portions of the Panel G topsoil stockpile and associated haul road are proposed to be located off-lease in the Sage Creek Inventoried Roadless Area (IRA) within the CTNF. This topsoil stockpile would not be required for several years and agency permits are not required until then. The topsoil stockpile and associated haul road could be redesigned so it would fit on the same ridge further south and outside of the IRA if necessary. The topsoil stockpile would have a similar footprint area to the current design and the environmental impacts for this disturbance would be very similar to what are described in this EIS. If necessary, site-specific environmental resource studies would be done before the revised stockpile is constructed.

During initial preparation of an area for open pit mining, surface water runoff control features would be constructed to be in place before overburden stripping begins. These features would help minimize surface water contact with seleniferous material and minimize the amount of water with a direct connection to the Wells formation aquifer. Uphill runon to open pit and external overburden areas would be limited by constructing collection and/or diversion ditches leading to collection ponds located off the proposed mining footprint. To the extent possible, runon and runoff would be routed around active open pits to minimize water collection in the pits. Downhill runoff from mine disturbance areas would be routed to sediment ponds and silt traps constructed to prevent direct hydraulic connections between this runoff and nearby streams.

A total of four individual pits are proposed for Panel F (**Figure 2.4-1**). The proposed sequence for Panel F mining would be Pit 1, 2, 3, and 4. Approximately 6.1 Million Loose Cubic Yards (MM LCY) of overburden generated from Pit 1 in Panel F would be trucked to the existing Panel E open pit to backfill an area of about 29 acres in Pit E-0 of Panel E (**Figure 2.4-3**). Another 0.5 MM LCY of Panel F chert overburden would be used to build the haul road between Panels E and F. Approximately 1.3 MM LCY of chert overburden would be used to build the haul road between Panels F and G. The volume of LCY is greater than BCY because of the 30 percent swell caused by breaking up the rock. Panel E is currently permitted to be completed with a remaining open pit (E-0) in its south end, but the Panel F overburden would be used to backfill this open pit. The total overburden volume (backfill and external) and area of Panel E is 66.9 MM LCY and 465 acres, so the amount of overburden contributed by Panel F would be relatively small in comparison, but would complete the reclamation of Panel E. In addition, backfilling of the E-0 pit reduces the potential volume of the external overburden fill at Panel F

by 6.1 MM LCY. Approval of additional backfill in Panel E would require Agency modification of the existing Panel E Mine and Reclamation Plan.

Approximately 4.8 MM LCY of excess overburden from the remainder of Pit 1 in Panel F would be permanently placed on a 38-acre external overburden fill area on-lease (Panel F External Overburden Fill on **Figure 2.4-1**). The overburden placed in this fill would include seleniferous material. This overburden disposal area would also be used as the location for mining equipment staging, a hot start facility, and other temporary mine support facilities. As designed, most of the surface on which this external fill is placed would drain back into the pit. Remaining overburden from subsequent pits in Panel F would be placed as backfill in Panel F.

Only one large pit is proposed for Panel G. Overburden generated from mining Panel G would be largely used as backfill in the Panel G open pit. Excess overburden would be permanently placed in two external overburden fills adjacent to the open pit area. One external overburden fill would hold 4.1 MM LCY of mixed run-of-mine (ROM) overburden on 64 acres east of the Panel G pit (Panel G East External Overburden Fill on **Figure 2.4-1**). The other external overburden fill would hold 4.3 MM LCY of chert overburden on 74 acres southwest of the pit (Panel G South External Overburden Fill on **Figure 2.4-1**). This southern overburden disposal area would be used as the location for mining equipment staging, a hot start facility, and other temporary mine support facilities. A water supply well would also be installed at Panel G to provide water for mining operations. This well would have an instantaneous pumping capacity of 500 gpm and an annual average withdrawal rate of 100 gpm.

The Panel G East External Overburden Fill would be too large to fit within the existing Deer Creek Lease and would extend off the existing lease onto USFS land. In Simplot's original mine plans all external overburden from Panel G was proposed to be placed in one fill southwest of the pit. The agencies informed Simplot they would not allow seleniferous overburden to be placed in the southwest overburden fill due to potential contamination of groundwater in the Rex Chert and a nearby spring. Consequently, Simplot reduced the volume of the southwest overburden fill and moved the seleniferous overburden from the southwest fill to a new location east of the pit. This fill would be located over the Wells formation and not the Rex Chert. This location is environmentally more suitable for long-term disposal of seleniferous overburden. To enable this east overburden fill, the BLM and USFS would need to issue appropriate land use authorizations to cover the approximately 18 acres of overburden fill extending off lease shown on **Figure 2.4-1**.

Simplot applied for a lease modification to accommodate the east overburden fill November 7, 2005. Under the present land management regulations of the agencies, BLM would not issue a lease modification for the area of the overburden fill off-lease and the USFS may not issue a Special Use Authorization for seleniferous overburden to be placed off-lease. However this overburden fill would not be required for more than seven years and agency permits are not required until then. If regulations are unchanged between now and when the overburden fill would need to be permitted, the fill would be redesigned so it would fit on lease. It would have a smaller footprint area and the actual environmental impacts for this fill would be less than described in this EIS.

Figure 2.4-3 Pit E-0 Area to be Backfilled from Panel F

Disturbance Areas and Reclamation Activities
The disturbance areas for the Proposed Action are shown in **Table 2.4-3**.

TABLE 2.4-3 PROPOSED ACTION DISTURBANCE AREAS (IN ACRES)

AREA	ROADS	PITS	EXTERNAL OVERBURDEN FILLS	OTHER*	TOTAL
Panel F on lease (roads acreage outside of pit limits)	5	295	38	28	366
Panel F Off Lease (Special Use Authorization)	39	0	0	20	59
North Lease Modification	23	2	0	0	25
South Lease Modification	0	138	0	4	142
Panel G on lease (roads acreage outside of pit limits)	21	328	120	4	473
Panel G Off Lease (Special Use Authorization) Includes haul road stockpiles for road	196	0	18	61	275
Total	284	763	176	117	1,340

* Settling ponds and ditches, topsoil stockpiles, and power line

Disturbed lands directly resulting from the Proposed Action would total 1,340 acres. New pits would disturb approximately 763 acres, of which approximately 717 acres would be backfilled and reclaimed. Forty-six acres of highwall and pit bottoms would remain after reclamation is complete. Approximately 29 acres of the Panel E open pit (currently approved and active) would be backfilled and reclaimed with overburden from Panel F. The rest of the disturbed acreage would consist of approximately 284 acres of roads, 176 acres of overburden disposal areas, 117 acres of runoff management facilities, power line, and topsoil piles for the mine pits (topsoil stockpiles for roads are included in the road disturbance figures), all of which would be reclaimed, with the exception of portions of haul/access roads that would not be reclaimed (see explanation below).

Concurrent reclamation in both proposed mine panels would reduce the overall open pit area at any one time to a figure less than what is shown in **Table 2.4-3**. As mining proceeds in one pit, the overburden from that mining would be used to backfill a previous pit. This reduces the time that seleniferous overburden is exposed to surface weathering effects and also reduces the area and time for exposure of the Wells formation rocks in the bottom of each pit. Concurrent reclamation would also be practiced for external overburden areas where completed portions of the fills would be regraded and prepared for reclamation while other portions of the fills would still be part of active mining operations. When these portions of pit backfills and external overburden fills are brought to final grade, topsoil would be applied on top of the final cover and seeded/fertilized to complete reclamation with vegetation. Application of the final cover on portions of the regraded mine disturbance, concurrent with ongoing mining in other areas, reduces the time period that ROM overburden is exposed to surface runoff and percolation of water directly into the ROM overburden.

The design of the Panel F and G pits is such that the maximum vertical height of any highwall is 350 feet or less. Because of the 20 years of mining experience at the Smoky Canyon Mine, Simplot is confident they would be able to mine to these depths. Slope stability aspects would

be closely monitored during mining to adjust maximum mining depths if significant slope instability becomes a concern. The disturbance area boundary for permitting is purposely placed 50 feet beyond the designed pit limits and other disturbances to allow for tree removal above a highwall and to remove unconsolidated materials per MSHA regulations.

Public and Tribal member motorized access to the active mining areas (including mining roads) would be controlled by Simplot for the duration of the active mining operations. Non-motorized access across active mining areas would typically be unrestricted but may be restricted by Simplot if necessary for public safety. This motorized access would be re-established to reclaimed mined areas, in concert with the USFS, when reclamation activities are judged to be completed by the Agencies.

Grazing would be controlled by Simplot in active mining areas with fencing and coordination with the USFS and grazing permittees. Grazing controls would be practiced until reclaimed areas are deemed ready for grazing by the USFS.

At the end of mining operations, Panels F and G would be largely backfilled with overburden and the pit areas would resemble natural contours (**Figure 2.4-4**). However, a 38-acre portion of Panel F would not be backfilled, which would leave part of the pit footwall and two remaining highwalls exposed; one would be 2,200 feet long with a maximum height of 250 feet, and the other would be 2,600 feet long with a maximum height of 175 feet. The remaining footwall of this open pit would be approximately 400 feet high and 1,000 feet long (measured up and down the slope). An 8-acre portion of the Panel G highwall 2,600 feet long and up to 250 feet high would be left exposed in the final configuration of this pit. These highwalls would be benched and have overall slope angles of 49 degrees (0.9h:1v).

Certain portions of the haul/access roads are proposed to be built across some areas of natural slopes that are steeper than 33 percent (3h:1v). In these areas, some lower portions of road fill slopes would be beyond the reach of an excavator to bring the fill material back up into the cut and would be left in place. In addition, final reclaimed road disturbance areas would have maximum slopes of 3h:1v, which is the practical limit of safe operation for reclamation construction equipment working on sloping surfaces. It also provides a stable reclamation slope that would not be an erosion problem and meets the intent of RFP guidelines and guidance in BLM and USFS reclamation manuals (BLM 1992; USDA n.d.). Where it is necessary to construct road cuts in natural slopes greater than 3h:1v, the upper portions of the road cuts would not receive backfill or be reclaimed. In these instances, the roads would be obliterated and would no longer function as a road, yet some visual remnant of the scarp would remain. Basically, this means that for road disturbances across natural slopes, less than 33 percent, there would be obliteration through full recontouring and reclamation, and for original slopes greater than 33 percent roads would be obliterated but the entire cut would not be fully recontoured. The areas of the haul/access roads that would not be reclaimed are shown on **Figure 2.4-4**.

If the Panel G West Haul/Access Road was selected by the Agencies and eventually constructed, it would not be fully reclaimed like the other haul/access roads. The CTNF has requested that Simplot leave a 20-foot wide, public access road along the portion of the haul/access road from Panel G to the summit between Deer Creek and Diamond Creek (**Figure 2.4-4**). This new road would be turned over to the USFS to replace the existing USFS road between Panel G and the mouth of South Fork Deer Creek (Wells Canyon Road, FR 146) and the existing USFS road between the Georgetown Canyon Road and the summit between Deer Creek and Diamond Creek (Diamond Creek Road, FR 1102).

Figure 2.4-4 Proposed Action Final Configuration Map

The existing USFS roads that would be replaced by this new road are, in places, narrow, steep, and/or located in Aquatic Influence Zones (AIZs). The replacement road would have a uniform width, maximum grades of 9.5 percent, and be located higher on the slopes above South Fork Deer Creek and Deer Creek to avoid paralleling these stream channels in the drainage bottoms like the existing road. When the new road is ready for public access, connections between the new public access road and the existing Wells Canyon, Diamond Creek, and Georgetown Canyon roads would be constructed. Simplot would then obliterate and reclaim the portions of the existing USFS roads that would no longer be required. Along these reclaimed roads, all drainage features (i.e., culverts) would be removed, and any fill across natural drainages would also be removed. The old road surface would then be ripped, and the fill portion of the old road template would be pulled back into the road. The final surface would then be graded and revegetated.

At stream crossings, the haul/access roadway width would also be reduced from 100 to 20 feet. The width of the fill crossing the streams would be reduced by an equal amount, and the culverts would be cut back and removed accordingly. The road grade for the public access road would not be altered from the haul/access road at these stream crossings.

When pit backfills, haul roads, and external overburden areas are no longer needed for active mine operations they would be regraded, covered with 1 to 2 feet of topsoil, scarified, fertilized, and seeded with the specified revegetation mix. This would stabilize the surface of these areas from erosion and reduce the amount of infiltration from precipitation or runoff into overburden fills. Prior to topsoiling, ROM overburden areas would be covered with a layer of low selenium overburden to further protect it from surface runoff and to reduce rooting of vegetation in it. Topsoiling and revegetating regraded areas would occur concurrent with ongoing mining in other areas and would reduce the total active mine disturbance area at any one time.

The revegetation of the reclaimed areas related to the mine panels and haul/access roads would primarily be with quick establishing, short-lived native and introduced grass species along with long-lived native bunch grasses and forbs. **Table 2.4-4** provides a list of grasses and forbs that could potentially be used in the seed mix. The actual seed mix could vary from this conceptual list based on adaptive management strategies (e.g. monitoring finds that the species used do not meet establishment criteria or other species are found to be more adapted to site conditions), seed availability, and cost considerations. A goal of the revegetation would be to establish healthy native bunch grass communities that are structurally diverse and would allow for succession over time. The forb component would be seeded at a low rate of approximately 1 - 8 seeds per square foot.

Other native forbs, shrubs, and trees would be seeded or planted in clusters where they are most likely to establish (i.e., appropriate aspect (east, west and north), soil depths, and soil maturity for the given species) and where there are no concerns relative to the integrity of the overburden covers or potential selenium uptake. These areas of more diverse seeding and planting can be referred to as “islands of diversity”. The individual plants can act as mother plants by producing seed for the gradual increase in diversity of the disturbed areas overtime.

TABLE 2.4-4 PROPOSED LIST OF APPROPRIATE REVEGETATION SPECIES

SPECIES	SUGGESTED RELEASES[1]
GRASSES	
Big Bluegrass	Sherman
Bluebunch Wheatgrass	P-7
Bottlebrush Squirreltail	Sand Hallow
Great Basin Wildrye	Magnar, Trailhead
Idaho fescue	Joseph, Nezpurs
Junegrass	Currently no released cultivars or selected class germplasm
Mountain Brome	Bromar, Garnet
Sandberg Bluegrass	Canbar, High Plains Germplasm
Slender wheatgrass	Primar, Pryor, Revenue, San Luis
Western Wheatgrass	Rosana
Sterile or cover crop grain (species not specified)	Example: Regreen, annual rye, Quickguard (sterile triticale), etc.
FORBS	
Blue Flax	Appar, Maple grove
Showy Goldeneye	Currently no released cultivars or selected class germplasm
Western Yarrow	Locally adapted ecotypes
Sticky geranium	Currently no released cultivars or selected class germplasm
Silky lupine	Currently no released cultivars or selected class germplasm
Clover	Releases with shallow or no taproot

[1]Listed are currently available cultivars and selected class germplasm that are relatively adapted to the site. Additional cultivars and other releases may become available in the future that are more adapted and genetically appropriate for the site.

Disturbance and reclaimed areas for the Proposed Action are shown in **Table 2.4-5**.

TABLE 2.4-5 COMPARISON OF DISTURBANCE AND RECLAMATION AREAS FOR THE PROPOSED ACTION

AREA	ROADS		PITS		EXTERNAL OVERBURDEN		OTHER*		TOTAL	
	DIST	RECL	DIST	RECL	DIST	RECL	DIST	RECL	DIST	RECL
Panel F on lease	5	4	295	257	38	38	28	28	366	327
Panel F Off Lease (SUA)	39	39	0	0	0	0	20	20	59	59
North Lease Mod.	23	20	2	2	0	0	0	0	25	22
South Lease Mod.	0	0	138	138	0	0	4	4	142	142
Panel G on lease	21	20	328	320	120	120	4	4	473	464
Panel G Off Lease (SUA)	196	176	0	0	18	18	61	61	275	255
Total	284	259	763	717	176	176	117	117	1,340	1,269

* Settling ponds and ditches, topsoil stockpiles, and power line.

2.5 Environmental Protection Measures Common to All Alternatives

The Proposed Action or Alternatives would be an extension of the existing Smoky Canyon Mine operations and the environmental and safety protection measures already being implemented and employed at the existing mining operations (see **Sections 2.3.4** to **2.3.11**) would be utilized in the new Panels F and G and associated haul/access roads. Applicable Standards and Guidelines, as outlined in the USFS RFP, have been evaluated by resource and considered for incorporation into the environmental protection measures for the Proposed Action. Specific environmental protection measures that would apply to the Proposed Action or Alternatives include the following:

2.5.1 Cultural Resources (including Paleontological Resources)

The proposed disturbance areas for the Proposed Action and Transportation Alternatives were inventoried for cultural resources during recent baseline surveys. Reports on these investigations, including descriptions of any discovered sites or cultural materials, were provided to the regulatory agencies. State Historic Preservation Office (SHPO) consultation and concurrence on site evaluations has been received by the USFS for all areas that have been inventoried. If unanticipated cultural materials, historic sites, or vertebrate macro-fossils (exclusive of disarticulated fish parts) are encountered during mining, the USFS and the BLM would be notified, and operations would be halted in the vicinity of the discovery until inspected by a professionally trained archaeologist or paleontologist, and a mitigation plan developed, if necessary. Vertebrate macrofossils would be avoided to the extent possible until the USFS or BLM conduct field surveys as needed to determine the significance of the fossils. At the discretion of the USFS or BLM, these fossils would be avoided for a length of time that is reasonable to allow Agency personnel to conduct the field surveys.

2.5.2 Air Quality

Dust from drilling activities would be controlled with dust collectors mounted on the drill rigs or with water. Fugitive dust from traffic on unpaved haul and access roads would be controlled with dust suppressant water applied by water trucks. Dust suppressing chemicals such as magnesium chloride and calcium chloride would also be used on roads as needed.

2.5.3 Soil

Available and suitable topsoil resources in the proposed mining disturbance areas have been described with baseline surveys. Suitable topsoil and growth medium would be salvaged during pre-stripping from proposed disturbed areas for use in reclamation. Soil suitability would be determined by US Department of Agriculture (USDA) Forest Service Soil Salvage guidelines (USDA 2003a). Soil that is salvaged would either be transported directly to areas being reclaimed or would be temporarily stockpiled.

Soil stockpiles would be protected from erosion by seeding and establishment of short-term vegetation cover. They would be built with as little compaction as possible and located out of traffic areas to minimize compaction from equipment.

Reclamation of disturbed areas that are no longer required for active mining operations would be conducted concurrent with other mining operations. Soil that is applied to reclaimed areas would be applied to a thickness of 1 to 2 feet with minimal compaction and protected from

erosion through revegetation and use, as necessary, of: run-on controls, mulch, swales, terraces, silt fences, and other erosion control measures. Areas that are left unreclaimed due to equipment restraints would be stabilized using approved BMPs.

2.5.4 Vegetation

Timber would be cruised and then harvested from proposed disturbance areas as directed by the USFS. Simplot would purchase all cruised timber at the market value appraised at the time of harvest. Non-commercial timber, brush, and slash would be stockpiled for use as runoff and sediment control brush barriers along the downhill margins of disturbed areas. Small brush and slash would be incorporated in the topsoil when it is salvaged.

Revegetation of disturbed areas would be conducted during reclamation activities by seeding and planting with the vegetation species mix approved by the USFS. Seeding of the approved reclamation seed mix would proceed no later than the first fall after a regraded area is covered with topsoil.

In order to control and prevent the spread of noxious weeds, Simplot would comply with the CTNF Integrated Pest Management Strategy approved in 1996, and also all off-road vehicles would be cleaned prior to entering the Project Area for the initial time.

Revegetation would be conducted to stabilize reclaimed surfaces with perennial vegetation communities and restore a post-mining land use for multiple use management. Potential species selected for revegetation have been previously identified in **Table 2.4-4**.

Livestock grazing in reclaimed areas would be controlled until the areas have become stabilized and are deemed ready for grazing by the USFS.

2.5.5 Surface Water and Groundwater

Simplot has submitted a set of BMPs for Erosion, Sedimentation, and Selenium Control that would apply to the design, construction, operation, and reclamation of the Panels F and G mine extension, including the haul/access roads (**Appendix 2C and 2D**). Part of that BMP document applies to protection of surface water and groundwater resources. Implementation of these BMPs, the environmental protection measures listed below, and standard and proposed concurrent reclamation practices, would assist in minimizing the contact between meteoric water and seleniferous material. These BMPs and environmental protection measures have been developed to reduce the types and severity of impacts to surface water and groundwater that have been experienced in the past with previous phosphate mining operations.

<u>Surface Water</u>
Drainage and diversion channels would be constructed to divert run-on water around disturbance areas and collect runoff from disturbed areas to route it to settling ponds and other sediment control features.

Runoff from disturbed areas would be directed to sediment ponds or silt traps to contain sediment in the runoff water. Sediment ponds would be designed and maintained to provide retention for the runoff from the 100-year, 24-hour storm event in the control area. They would be located outside and off of seleniferous overburden fills. Typically, they would be located

near the outside edges of mining disturbance. For Panel F, approximately four ponds are planned to be constructed during initial development, increasing to about 13 ponds during later phases of mining. These ponds are expected to range in size from about 0.5 to 1.5 acres, with depths of several feet. For Panel G, a similar number and size range would be constructed. As ponds are no longer needed, they would be decommissioned.

The ponds would be used to collect storm water runoff and snow melt runoff exclusively; no other waste streams would be allowed to enter the ponds and/or commingle with this runoff. The primary function of these ponds would be to retain sediments. Simplot would also minimize the potential for dissolved constituents that may be present in this stored runoff from entering area streams by minimizing the hydraulic connection between the ponds and surface water, as described in **Appendix 2D**. However, typically water would dissipate through evaporation rather than infiltration.

While these ponds would not often discharge, there would be no prohibition to them doing so on occasion, either under their Storm Water permit or by the USFS. When discharge does occur, suspended solids would be reduced in the discharged water, compared to the incoming concentrations, due to settling in the ponds. To control any such discharges, all ponds would be designed with stable spillways so that discharge does not erode the spillways or instigate structural failure of the ponds. Discharges would be sampled and assessed for COPCs under the Mine's SWPPP.

Similarly, erosion of channels and fills would be controlled by use of erosion control blankets, vegetation, chert or limestone riprap, or gabions filled with chert or limestone. Culverts would be properly designed for water flow and fish passage and installed for road crossings of waterways.

Snow removal would be practiced to prevent the soil contained in the removed snow from being released outside of the runoff control area and to reduce man-made entrainment of snow in external overburden fills to the extent practicable. Snow would be moved to Agency approved locations.

Perennial and significant intermittent drainages would be avoided in location of overburden disposal areas to the extent possible.

Drainage channels that are routed over overburden would be designed to reduce infiltration of channel flow into underlying seleniferous overburden.

Fills for road and parking area surfaces would be constructed of chert and would be designed with slopes and temporary vegetation, as applicable, to stabilize slopes and reduce generation of sediment in runoff from these areas.

Seleniferous overburden would be placed in approved fills and covered with chert and topsoil.

The bottom layer of seleniferous overburden fills would be constructed to reduce the potential for formation of overburden seeps. Low permeability layers of soil or shale in foundations of external overburden disposal area slopes would be modified or removed to avoid the perching of water leading to the formation of overburden seeps.

Surface water resources would be monitored in accordance with an agency-approved Monitoring Plan for the preferred alternative.

Groundwater

Covering natural seeps and springs with overburden would be avoided to eliminate introduction of water into seleniferous overburden from these sources.

Overburden final slopes would be graded to promote runoff and avoid ponding to reduce infiltration from precipitation and snowmelt.

Runoff and sediment control facilities would be located off overburden fills to the extent feasible to reduce infiltration of collected water into seleniferous overburden.

South- and west-facing aspects have been incorporated into final overburden fill slopes as possible to enhance evapotranspiration and reduce infiltration. Topsoil and vegetation would be re-established on overburden disposal areas to enhance evapotranspiration of precipitation.

Runoff from haul road drainage ditches onto external seleniferous overburden fills would be avoided.

Stockpiled areas of snow would be controlled and placed in areas to reduce infiltration or mixing of snow or snow melt into/with external overburden to the extent practicable.

Seleniferous overburden would be mined and disposed of in a timely manner to reduce exposure of this material to surface weathering and oxidation, the process that liberates soluble selenium compounds. Overburden has been characterized to determine selenium containing (seleniferous) lithologic units that can generate problematic leachate or promote bioaccumulation. Overburden from these lithologic units would be selectively handled to reduce its exposure to surface environments. Surface area of seleniferous overburden fills would be reduced by design to the extent practicable to limit the amount of water infiltration and potential release.

Seleniferous overburden fills would be covered with chert and topsoil to reduce exposure of the overburden to vegetation roots, to protect them from erosion, and to promote evapotranspiration from the cover (**Section 2.5.8**).

Groundwater would be monitored in accordance with the requirements of the Record of Decision and an agency-approved Monitoring Plan for the preferred alternative.

2.5.6 Wetlands

Boundaries and characteristics of wetlands and riparian areas in the disturbance footprints of the Proposed Action and Alternatives have been described during recent baseline studies. Disturbance of these areas would be minimized through design efforts. Wetland disturbances would be permitted and mitigated, and/or restored as directed by the USACE.

Runoff from planned disturbances upgradient of wetlands and riparian areas would be controlled to reduce transport of sediment and other contaminants into the wetlands and riparian areas.

2.5.7 Wildlife and Fisheries/Aquatics

Construction in stream channels would be planned in advance to occur during low flows, and the channels and banks would be stabilized against erosion as part of the initial construction.

Culverts in stream channels that are known fisheries would be designed for the passage of migrating fish. Pipes (bypass pipes left in place or installed independently) would also be placed for passage of amphibians in known and/or suspected amphibian habitat areas and near Sage Meadows.

Biological surveys would be conducted in areas planned for disturbance to identify any active nests for bird species. Avoidance plans would be developed as necessary before these areas are disturbed.

Drivers would be required to report all collisions on the mine property involving wildlife, and these incidents would be reported to the appropriate agencies. If necessary, mitigation measures would be developed for areas with high collision rates to reduce the collision frequency and vehicle damage.

Mining operations would accommodate big game migration in that undisturbed habitat and reclaimed areas would provide migration routes around barriers such as headwalls. Haul road fill material is not considered a barrier to movement.
Aquatic habitat monitoring would be conducted in accordance with the requirements of the Record of Decision and an agency-approved Monitoring Plan for the preferred alternatives.

2.5.8 Overburden Cover

Selenium and other COPCs contained in the seleniferous shale overburden can be mobilized to the environment through a number of pathways including: erosion and transportation as sediment in air or water, dissolution and washing away in surface runoff, dissolution and infiltration in percolating water, vegetative uptake by plant roots, and ingestion of plants subject to selenium bioaccumulation by wildlife and livestock.

Pre-1999 practices in design of the overburden disposal facilities at the Smoky Canyon Mine and other mines typically consisted of handling overburden material as a mixture as it came from the mine pit, sometimes purposely handling it so as to cover the entire surface of the overburden disposal facility with a layer of shale which was intended to weather into a topsoil substitute growth medium. These past practices placed shales, now known to have high selenium concentrations, on the surface of waste piles. The selenium was available for mobilization to the environment in one or more of the release pathways listed above. This practice is no longer in use.

The current technique to reduce the exposure of seleniferous overburden to the surface environment is the placement of topsoil, and low selenium chert as a cover (**Figure 2.5-1**). The term “chert” as used in this document refers to overburden with a low selenium concentration and can include chert, cherty limestone, and limestone. Chert of sufficient depth and coarse texture would deter deep root penetration into underlying seleniferous overburden reducing bioaccumulation in reclamation vegetation. Separation of vegetation roots from the seleniferous overburden would be accomplished by the thick chert and topsoil cover. Rooting depths for the

grass and forb vegetation mix proposed for reclamation are typically up to about 4 feet, which is less than the thickness of the chert and topsoil cover.

The proposed cover would control erosion by covering all seleniferous overburden on the tops of the overburden fills with at least 4 feet of chert material resistant to weathering and erosion and approximately 1 to 2 feet of topsoil over the chert for a total cover thickness of 5 to 6 feet. All areas of the chert/topsoil cover would also be revegetated to further protect the reclaimed surface from erosion and provide evapotranspiration. Simplot would monitor the reclaimed areas after revegetation is complete to identify erosion potential or problems. Identified problems would be addressed.

Infiltration of precipitation and snow melt into the seleniferous overburden shales would be reduced by a number of features including: 1) producing a final grade on reclaimed surfaces to shed runoff instead of letting it pond and infiltrate; 2) establishing a perennial vegetation cover which would consume soil moisture during the growing season; and 3) providing adequate thickness of topsoil and chert subsoil to retain quantities of annual infiltration in the chert cover, making it available for plants to remove through evapotranspiration during the growing season.

2.5.9 Management of Hazardous Materials

Management of hazardous materials, hazardous wastes, and petroleum products would be in compliance with applicable federal and state requirements and would be the same as currently practiced at the Smoky Canyon Mine (see **Sections 2.3.8** through **2.3.10**).

2.5.10 Inspections, Records, and Monitoring

During operations, daily inspections would be made by mine supervisory staff of all active mine operations to ensure they are conducted in compliance with conditions of approvals, applicable permits, and regulations. Records of these observations would be kept in the mine records.

Regular SWPPP and SPCC inspections would be conducted to observe compliance with these plans and detect any conditions requiring modification to maintain compliance with the requirements and operating conditions included in the plans. Necessary maintenance or repair actions would be completed and filed in mine records.

Samples of storm water, groundwater, soil, sediment, aquatic biota, vegetation, and surface water would be taken by mine staff and contractors as required in compliance with permits and conditions of approvals.

Simplot has submitted a set of BMPs for Erosion, Sedimentation, and Selenium Control that would apply to the design, construction, operation, and reclamation of the Panels F and G mine extension, including the haul/access roads (**Appendix 2C and 2D**). Part of the BMP documents apply to the types of monitoring that are proposed to track the effectiveness of the various mitigative measures.

BLM and FS inspect operations generally monthly and often more frequently as necessary in order to determine proponent's compliance with Mine Plan approvals.

Figure 2.5-1 Overburden Cover Design

Environmental monitoring at the existing Smoky Canyon Mine follows a detailed monitoring plan developed by Simplot and approved by the Agencies. This monitoring plan would be expanded to include monitoring specifically required for the proposed Panels F and G operations. The types of additional monitoring that would be added to this plan are described in **Section 2.10** and **Appendix 2E**.

2.6 Alternatives to the Proposed Action

The need for a wide, objective review of potential alternatives stems from 40 CFR 1500.2(e), which states that the NEPA process must "identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment," and also as directed under 40 CFR 1501.2(c) which states that agencies need to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved resource conflicts concerning alterative uses of available resources..."

The Alternatives proposed for detailed analysis in this EIS meet the following definitions of a "reasonable alternative":

- Generally meets the Purpose and Need and is needed to address one or more significant issues,
- Would not require significant changes in government policy or legislation (Case Law Natural Resources Defense Council v. Callaway 524 F.2d 79 2cd Circuit, 1975),
- Would avoid or minimize adverse effect of the actions upon the quality of the human environment; and
- Would be subject to the "rule of reason," with the alternative being in proportion to the significance of the environmental impacts related to the proposed action. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense. An alternative that is outside the jurisdiction of the lead agency must still be analyzed if it is reasonable.

A range of alternatives has been considered for this analysis. There are six alternatives for the mining activities, identified as Alternatives A through F. There are also eight alternatives for the transportation of ore, personnel, and materials, identified as Alternatives 1 through 8. Finally, the No Action Alternative is also being considered. These mining and transportation alternatives are discussed in the following sections and are evaluated in Chapter 4 along with the Proposed Action. In addition to the alternatives that are being considered in detail, four other mining alternatives and nine transportation alternatives were considered but eliminated from this analysis for reasons described in **Section 2.7**.

The description of existing mine and mill operations contained in **Sections 2.3.4** through **2.3.11** would also apply to the mining and transportation alternatives evaluated in this document. The activities and conditions included in the description of the Proposed Action (**Section 2.4**) would apply to the Alternatives, except where specific differences are identified in the descriptions of the Alternatives. Finally, the environmental protection measures described for the Proposed Action (**Section 2.5**) would also apply to the Alternatives.

The Agencies developed the Agency Preferred Alternative with a combination of the alternative components presented here and Simplot's Proposed Action.

2.6.1 Mining Alternatives

The following mining alternatives have been designed in response to scoping input and Agency concerns. Comparisons of the disturbance characteristics for these alternatives are listed in **Table 2.6-1**.

TABLE 2.6-1 SUMMARY OF DISTURBANCE AND RECLAMATION AREAS FOR THE MINING ALTERNATIVES (ACRES)

ALTERNATIVE	A*	B	C	D	E	F
Disturbed Area	1,054 / 918	1,056	1,056	1,193	1,028	1,028
Reclaimed Area	1,008 / 901	1,018	1,056	1,147	982	982
Unreclaimed Area	46 / 17	38	0	46	46	46

* Two values are provided for No North Lease Modification / No South Lease Modification

Alternative A – No South and/or North Panel F Lease Modifications – This alternative analyzes not mining the ore within the north and/or south Panel F Lease modification areas. It addresses scoping concerns about allowing new leases and mining in IRAs. Simplot has applied for a two-part lease modification to expand Federal Phosphate Lease I-27512 for the Panel F operations: a smaller 120-acre lease modification on the northern edge of the lease (North Lease Modification), and a larger 400-acre lease modification on the southern edge of the lease (South Lease Modification) (**Figure 2.4-1**). A program of mineral exploration was conducted in the South Lease Modification area to confirm phosphate resources in that proposed lease modification and to collect hydrogeologic information for this EIS (BLM and USFS 2005). The Proposed Action assumes both lease modifications would be approved and includes mining plans for these areas. The change in environmental impacts from <u>not</u> issuing these lease modifications and <u>not</u> mining these areas are evaluated in this mining alternative to the Proposed Action.

This alternative addresses the scoping concerns over mining within portions of the Sage Creek IRA that are currently not under lease. Approximately 22 percent of the ore in the Panel F Proposed Action mine plan is situated within the South Lease Modification area alone (Simplot Mine and Reclamation Plan). The North Lease Modification is intended to allow mining of phosphate ore while building the Proposed Action haul/access road north of the existing lease, but more importantly, allows mining of the phosphate ore topographically lower than could be accessed from above. Approximately 6 percent of recoverable phosphate reserves in Panel F would be lost without the approval of the Proposed Action Panel F Haul/Access Road. If this alternative were fully adopted, there would be no Panel F mining disturbance outside of the existing Lease I-27512 boundaries. The mining disturbances included in the Proposed Action for the North and South Lease Modifications would not occur and would be subtracted from the total disturbance included in the Proposed Action, with the exception of the Proposed Action power line that would remain in the same location regardless of this alternative.

If the North Lease Modification were not approved, the Proposed Action Panel F Haul/Access Road might also not be constructed because it occurs in the North Lease Modification area and would cross part of the Sage Creek IRA (see Transportation Alternative 1). In this event, the CTNF could issue a SUA for the Proposed Action haul/access road across unleased federal

land. If the Proposed Action Panel F Haul/Access Road were not approved, it would be replaced by the Alternate Panel F Haul/Access Road (Transportation Alternative 1), which would enter Panel F south of the Proposed Action road and at a higher elevation.

If this mining alternative was selected, the pit boundaries for the Panel F operations would be changed on the north and south ends as shown in **Figure 2.6-1**. The main difference between this mine area and the Proposed Action (**Figure 2.4-1**) is that the area of Pit 3 would be greatly reduced and the mine disturbance would not cross over the topographic divide into the Deer Creek drainage. In addition to mining less ore, the reduced mining plan would also involve handling less overburden so the final reclamation contours would be different (**Figure 2.6-2**). The main difference in the final configuration of this alternative and the Proposed Action would be that the remaining highwall would be located in the south end of Pit 1 and the north end of Pit 2 instead of in the north end of Pit 4. The remaining highwall would be approximately 2,400 feet long compared to the 4,800 feet of remaining highwall proposed for Pit 4 in the Proposed Action.

The design of open pit phosphate mines is a balance between recovery of the phosphate ore, and the revenue that ore will produce, with the overall costs of mining and milling the ore.

Removing and handling the overburden from on top of the buried ore beds is the largest cost of the mining operation. The phosphate ore beds are inclined (dipped) in the ground, and mining them proceeds down-dip until the cost of removing the overburden is roughly balanced with the revenue derived from the ore that is removed. The ratio of the overburden handled to the ore removed is called the “stripping ratio”. The lower the overall cost of mining and the higher the economic stripping ratio, the deeper the ore can be mined, which results in a larger open pit and more overburden to handle. When mining and processing costs significantly increase for any reason, the cost of mining the ore can be reduced by reducing the stripping ratio, which results in less overburden being removed, less ore being recovered, and smaller open pits. Regulations require that phosphate ore from federal leases should be mined to the maximum extent practicable, within economic limits that apply to each specific mining operation.

For this alternative and Mining Alternatives B, C, D, and F, the increased operating costs inherent to each alternative could be balanced by redesign of the open pits to reduce stripping ratios. This would reduce the size of the open pits and the amount of phosphate ore extracted from the mining operations, shortening the life of the mine. The reduction in recovered ore could mean that Simplot would potentially begin mining operations at another location in Southeastern Idaho earlier than currently planned. Thus, more of the non-renewable phosphate resource would be left unrecovered. The amount of new surface disturbance required at a different mine to obtain the same amount of ore left in the pits at Panels F and G under this alternative would likely be greater because of the new access and ancillary disturbances necessary for the new mine. The detailed mine planning for the redesigned mine pits at Panels F and G, as well as the design for the new mine at another location, is beyond the scope of this EIS. The specifics of these effects are discussed in **Chapter 4** of this EIS.

The disturbed areas for the Panel F mining operations under this alternative would be reduced (as compared to the Proposed Action) as shown in **Table 2.6-2**.

TABLE 2.6-2 ALTERNATIVE A DISTURBANCE AREAS FOR PANEL F ON LEASE (IN ACRES)

AREA	ROADS	PITS	EXTERNAL OVERBURDEN FILLS	OTHER	TOTAL
Proposed Action Panel F Total (includes lease modifications)	28	435	38	28	529
North Lease Modification	-23*	-2	0	NC	-25
South Lease Modification	0	-138	0	NC	-138
Revised Panel F Total **	5	295	38	28	366

NC = No change would occur to settling ponds and ditches, topsoil stockpiles, and power line.
* Assumes the Alternate Panel F Haul/Access Road would be selected.
**Acreage may be less because disturbance boundaries do not conform to lease boundaries.

Alternative B - No External Seleniferous Overburden Fills – This alternative addresses scoping concerns about potential selenium contamination from external overburden fills. In this alternative, all the overburden initially proposed for disposal in the external overburden fills would still be placed there during mining; however, 4.7 MM BCY of seleniferous overburden would subsequently be removed from the external fills and placed back in the pit backfills. The duration of reclamation work would increase in this alternative because of the need to double handle more of the overburden material than under the Proposed Action. This would result in a delay in reclamation of approximately 6.5 months.

This alternative would have the same initial disturbance footprint as the Proposed Action because the full external overburden disturbance areas would be needed to temporarily store seleniferous overburden, which would then be relocated to a pit backfill during final stages of mining. The volume of overburden permanently disposed of in the external overburden fills would be less, changing the final contours of these areas compared to the Proposed Action (**Figure 2.6-3**).

The area potentially requiring a cover to reduce releases of COPCs from seleniferous overburden would be less than the Proposed Action because all seleniferous overburden would be consolidated to a smaller footprint area than the Proposed Action. The area of seleniferous overburden disposal in this alternative would be approximately 725 acres compared to 819 acres for the Proposed Action.

The remaining highwalls in Panel F would remain the same as in the Proposed Action because the seleniferous overburden relocated from the external overburden fill would be placed into Pits 1 and 2 and not in Pit 4. However, the remaining highwall in Panel G would be completely backfilled in this alternative.

Alternative C - No External Overburden Fills at All – This alternative addresses scoping concerns related to environmental effects from any external overburden fills. In this alternative, all the overburden initially proposed for disposal in the external overburden fills would still be placed there during mining, however all this overburden (10.1 MM BCY) would subsequently be removed from the external fills and placed back in the pit backfills. Operations would need to be extended by 12.5 months to allow time for all this overburden to be relocated back to the open pits.

Figure 2.6-1 Alternative A-Panel F Ultimate Pit Map without Lease Modifications

Figure 2.6-2 Alternative A-Panel F Final Configuration Map without Lease Modifications

Figure 2.6-3 Alternative B-Final Configuration without Seleniferous External Overburden

Figure 2.6-4 Alternative C-Final Configuration without Any External Overburden

This alternative would also have approximately the same initial disturbance footprint as the Proposed Action because the full external overburden disturbance area would be needed to temporarily store the overburden, which would all then be relocated to the pits during final stages of mining.

This alternative would result in higher pit backfill final contours than in the Proposed Action or Alternative B. The footprints of the external overburden fills would be restored to approximate original contours. The remaining highwalls would be eliminated in this alternative compared to the Proposed Action or Alternative B because more overburden would be relocated to the pits where it would be used to completely bury all highwalls (**Figure 2.6-4**).

The area potentially requiring a cover to reduce releases of COPCs from seleniferous overburden would be less than the Proposed Action, and 38 acres greater than Alternative B. This is because all seleniferous overburden would be removed from the external overburden fills in Alternative B, so moving all the remaining non-seleniferous overburden from the external overburden fills back to the pit backfills in this alternative does not further reduce the area of potential cover. The final area of seleniferous overburden requiring a cover in this alternative would be the pit backfills, 763 acres.

Alternative D - Store and Release Cover on Overburden Fills – This alternative addresses concerns over groundwater impacts from infiltration of precipitation into seleniferous overburden, which could then percolate out the bottoms of the overburden fills and eventually enter the groundwater beneath these sites.

The groundwater impact analysis of the Proposed Action and Mining Alternatives A through C using the Proposed Action cover of 1-2 feet of topsoil and 4 feet of chert indicated that there could be exceedances of State groundwater and surface water standards for selenium. The agencies therefore worked with Simplot to develop a mining alternative that would reduce percolation of water through the seleniferous overburden. The water quality impact analysis for this alternative in the DEIS was based on modeling that indicated the maximum allowable percolation rate through the overburden fills to the groundwater that would just comply with applicable water quality standards. The conceptual design of an infiltration barrier that was intended to provide the necessary control on percolation was presented for this alternative in the DEIS. The description of this design is repeated below under “DEIS Infiltration Barrier”.

Following release of the DEIS, Simplot conducted extensive geotechnical and hydrologic studies of the proposed cover which resulted in a modified cover design that would provide improved performance compared to the design proposed in the DEIS. The design studies also addressed comments received on the DEIS that uncertainties with modeling should be accommodated in a cover design and that the final design should be more protective of water quality than that evaluated in the DEIS. These objectives were achieved with the modified cover design, which is described below under “Store and Release Cover to Meet DEIS Alternative D Net Percolation Targets”.

Also in response to comments on the DEIS, the agencies and Simplot re-evaluated the potential for building a cover with no net percolation to provide maximum protection for water quality. Use of synthetic infiltration barriers was evaluated and found to be technically and economically unfeasible. A summary of this review has been added to **Section 2.7** under “Impermeable Infiltration Barriers”. The effort to identify improved protection for water quality was continued

through additional design studies that showed significantly greater protection of water quality could be achieved through use of a more robust store and release cover design. The agencies have determined that this design is at the limits of economical feasibility for this project. This design is described below under “Minimum Net Percolation Store and Release Cover”.

The Agencies and Simplot have agreed that Alternative D would only utilize the Minimum Net Percolation Store and Release Cover.

DEIS Infiltration Barrier

In the DEIS for Panels F and G, Alternative D was conceptually proposed in this section as consisting of a 12-inch thick, compacted Dinwoody formation shale infiltration barrier covered with chert and topsoil. Dinwoody formation shale is a stratigraphic unit in the overburden of the proposed panels that consists of interbedded clay mudstone, shale and siltstone. Excavated Dinwoody formation is well known through experience at the Smoky Canyon Mine to contain soft earthlike material suitable for construction purposes and would act as a low-permeability barrier when compacted. This infiltration barrier would be a series of discontinuous, overlapping, “shingles” of compacted Dinwoody material that would be built concurrently with overburden slope reclamation.

To meet water quality standards, the targeted maximum average annual net percolation through the Alternative D cover was determined in **Section 4.3.1** of the DEIS to be 0.8 inches per year in Panels F Pits 1 and 2, 1.5 inches per year in Panel F Pit 3, and 1.2 inches per year in Panel G. These target net percolation rates were determined with iterative runs of the groundwater impact model to determine the maximum percolation rate allowable to just maintain surface water quality in compliance with State regulations. The DEIS also indicated that final designs may be different than described but would still provide the level of infiltration reduction required to protect groundwater and surface water quality to levels in concert with applicable regulatory requirements.

Since the DEIS was released additional engineering evaluation of the shingle-type infiltration barrier has determined that the construction costs would be larger than initially considered due to: 1) need to provide engineered compaction of the Dinwoody material to low permeabilities; 2) large volumes of chert would need to be specially handled, compared to the total amount available, to develop the necessary stepped configuration for this design; and 3) equipment costs to develop the stair step outer slope of the ROM material. It was determined that these additional costs would shorten the Panel G mine life to only 1 year, essentially eliminating this mining operation and reducing the mine life in Panel F by 3 years. This type of design may have merit in other applications but the Agencies currently favor an improved design for Panels F and G (see below).

Store and Release Cover to Meet DEIS Alternative D Net Percolation Targets

Another type of cover design that can limit percolation of water into underlying materials is a “store and release” cover. A store and release cover limits net percolation of moisture into underlying materials not with a low permeability infiltration barrier but by maximizing soil moisture storage for the subsequent removal by evapotranspiration. Evapotranspiration is the sum of evaporation and plant transpiration. Evaporation is the transfer of water to the air either

from the soil, canopy interception, or by open water. Transpiration accounts for the loss of water to the air by plants.

The greater the storage capacity in the root zone and evapotranspirative properties of the top layers of a cover, the lower the potential for percolation through the cover system. There is extensive experience with these types of earth covers and they have been used in a wide variety of settings for closure of mining facilities (Ayres et al. 2003, 2005a, 2005b; O'Kane 2003, 2004a, 2004b; O'Kane and Wels 2003; Wels et al. 2001a, 2001b).

Design studies have been completed for Panels F and G for a cover design that would incorporate a store and release cover using topsoil, Dinwoody material, and chert instead of the previously proposed shingle-type infiltration barrier. This store and release cover does not rely on a specially constructed, low-permeability infiltration barrier to intercept and divert percolating water and therefore does not require the Dinwoody material to be as uniform and low permeability as the design proposed in the DEIS. The rate of net infiltration of the store and release cover has been shown by modeling to be equal to or lower than the net percolation targets established in the DEIS (see "DEIS Infiltration Barrier" above) (Simplot 2007).

The design studies for this cover have included material testing of topsoil, Dinwoody material, and chert to develop an understanding of the hydraulic properties of these three materials (Simplot 2007). The materials testing of the topsoil, Dinwoody, and chert has shown these materials to be usable in constructing a store and release cover (Simplot 2007). The gradation (grain size) of the cover materials are shown in **Table 2.6-3**.

TABLE 2.6-3 GRADATION FOR COVER MATERIALS

Material	Gravel (> No. 10)	Sand (No. 10 – No. 200)	Silt (No. 200 – 0.005 mm)	Clay (< 0.005 mm)
Topsoil	10%	22%	33%	35%
Dinwoody	26%	16%	23%	35%
Chert*	74%	14%	9%	3%
ROM CWS	88%	9%	2%	1%

These gradations indicate that Dinwoody and topsoil materials are relatively enriched in clay and silt content compared to the chert and ROM Center Waste Shale. This would suggest the topsoil and Dinwoody would have lower permeabilities (same as hydraulic conductivity) and higher water holding capacities than the chert and ROM overburden, which would be more free-draining. Testing of the hydraulic and moisture retention properties of the materials provided: porosity, soil water characterization curve (SWCC) derived from the Fredlund & Xing variables, specific gravity, and saturated hydraulic conductivity (K_{sat}) values shown in **Table 2.6-4** that were used in modeling and performance of various cover designs.

TABLE 2.6-4 MOISTURE RETENTION PROPERTIES OF COVER MATERIALS

Material	Porosity	Fredlund & Xing Variables			Specific Gravity	K_{sat} (cm/s)
		a	n	m		
Topsoil	0.49	13.0	1.29	0.60	2.64	8.9×10^{-5}
Upper Dinwoody**	0.43	6.1	0.64	0.42	2.64	1.3×10^{-4}
Lower Dinwoody**	0.40	16.4	0.60	0.52	2.64	1.0×10^{-5}
Deep Dinwoody**	0.37	40.1	0.89	0.39	2.64	1.0×10^{-6}
Chert*	0.45	0.5	0.81	0.65	2.64	2.0×10^{-2}
ROM CWS	0.36	1.1	0.66	0.98	2.64	2.6×10^{-2}

* Fredlund and Xing used to describe chert SWCC at suctions higher than 0.01 kPa. The porosity used with these variables is 0.31.
** References to Lower, Upper, and Deep Dinwoody do not follow conventional geologic nomenclature; the terms refer to layers used in the modeling.

Conservative material properties (i.e. higher permeabilities than indicated by laboratory testing) were selected for modeling to account for the difference between as-built and long-term conditions. Topsoil permeability testing indicated permeabilities of 2×10^{-5} cm/sec but this was set at 8.9×10^{-5} cm/sec for the design studies of the cover. The smaller the number, the less permeable the material is. Permeability testing of the Dinwoody material showed a two-foot thick layer could be constructed in a cover to a permeability in the low 10^{-6} cm/sec range but this was set in the design studies to approximately two orders of magnitude higher for the upper half of this two-foot layer and one order of magnitude higher for the lower half to account for the effects of freeze-thaw, roots, and bioturbation (burrowing animals) in the cover. The topsoil and Dinwoody layers would store annual infiltration of snowmelt and precipitation so evapotranspiration from the soil and plants rooting can remove this water. This would enhance the water storage capacity of the overlying Dinwoody layers and reduce root penetration into the underlying ROM overburden.

One-dimensional unsaturated zone water infiltration modeling was conducted on different store and release cover configurations using the three construction materials with a state-of-the-art, numerical model, VADOSE/W (Simplot 2007). VADOSE/W is a finite element model which can perform two-dimensional (2-D) simulations of unsaturated flow and predict pressure head, temperature profiles, heat and mass transfer, and water vapor movement. The climate database used in the modeling came from Slug Creek data adjusted to the observed climate patterns for the area to construct 100 years of daily temperature and precipitation data for input into the modeling. Time and duration of precipitation events was based on data obtained from the National Climate Data Center (NCDC) for Pocatello as were relative humidity and average wind speed. Daily net solar radiation was estimated for the site with the model for a south-facing slope and then reduced for the other slope aspects. Predicted vegetation cover scenarios for short-term and long-term conditions were developed by the USFS and used to determine a leaf area index (LAI). Rooting depth was set to 36 inches. Modeling simulated 100 years of performance of the cover.

First, a one-dimensional (1-D) water infiltration modeling effort focused on the water balance in the different cover configurations only influenced by evaporation, transpiration, runoff, and vertical percolation. The results of this modeling suggested that a store and release cover using 1-foot of topsoil over 2 feet of Dinwoody and 2 feet of chert would meet the net infiltration

targets set by the DEIS. Sensitivity analyses were then conducted on this design to determine the impact of changes in material properties, climate, and vegetation on the performance of the cover. A total of 33 different parameter changes were modeled to fully explore the sensitivity of the model results to these changes. Sensitivity analyses showed that net percolation results through the cover were most sensitive to thickening the Dinwoody, changing its permeability, or decreasing topsoil permeability. Net solar radiation differences for slope aspects resulted in a 17 percent difference in the amount of net percolation predicted for a south-facing slope compared to a north-facing slope when no other changes are made. The amount of net percolation was reduced by increased wind speed indicating that sheltered areas will experience higher rates of net percolation. Changes made to the simulated vegetation had the smallest impact on the amount of net percolation because most of the net percolation at the site occurs during or immediately following spring snowmelt when vegetation was modeled to be dormant and potential evaporation rates are low. Changes in single climate variables had little impact on net percolation (Simplot 2007). 1-D modeling suggested that a cover consisting from top-down of 1-foot topsoil, 1-foot of Dinwoody with a weathered permeability of 1×10^{-4} cm/sec, 1-foot of Dinwoody with a weathered permeability of 1×10^{-5} cm/sec, and 2-feet of chert might meet the net percolation design objectives set by the DEIS for Alternative D (**Figure 2.6-5)**.

The 1-D modeling studies were followed by 2-D modeling studies that allowed study of the water balance in a more realistic manner as influenced by downslope movement of water in the cover (Simplot 2007). In the 2-D modeling, the performance of a 2,075 foot long, 3h:1v slope was modeled (similar to design slopes for Panels F and G). From these 2-D modeling studies, the cover design of 1 foot of topsoil, 2 feet of Dinwoody shale, and 2 feet of chert was shown to limit average annual net percolation to 1.2 to 1.4 inches per year. This cover design was called the “Base Case” design (**Figure 2.6-5**). This would meet the design target rates set by the DEIS of 1.2 and 1.5 inches per year for Panel G and Pit 3 of Panel F respectively. It was not found sufficient for the DEIS design target percolation rate for Panel F Pits 1 and 2 (the north end of the panel). An alternate cover design including an additional 1-foot thick layer of Dinwoody under the upper and lower Dinwoody layers was shown to limit net percolation to 0.6 inches/year. This design was referred to as the “Deep Dinwoody” design (**Figure 2.6-5**). This would meet the target net percolation rate set by the DEIS for Panel F, Pits 1 and 2, which is 0.8 inches per year Combining these two designs, the cover would comply with the target net percolation rates established in the DEIS which would meet applicable water quality standards.

<u>Minimum Net Percolation Store and Release Cover</u>

Comments on the DEIS suggested the Agencies should evaluate a cover design that would reduce net percolation into the overburden to the maximum extent possible. The Agencies looked at synthetic infiltration barriers because they provide the maximum amount of reduction for net percolation. Use of synthetic infiltration barriers under the overburden fills had technical difficulties related to construction of the infiltration barrier on steep slopes and issues related to long-term water treatment of the collected seepage. Synthetic infiltration barriers in general were found to be economically unfeasible for Panels F and G so this approach to reduction of net percolation was eliminated from further evaluation (See **Section 2.7**).

In response to the above concern, the Agencies and Simplot evaluated a cover design that would provide the most reduction of net percolation into the overburden while still being economically feasible for this specific application. This was called the Minimum Net Percolation Store and Release Cover design. It was determined that the Deep Dinwoody design, with its

0.6 inch/year net percolation rate would limit percolation to less than the target rate for the northern portion of Panel F (0.8 inch/year), and significantly less than the target rate for the southern portion of Panel F (1.5 inch/year) and Panel G (1.2 inch/year). Economic evaluations of the cost of this design showed it would result in a reduction of ore recovery of approximately 18 percent of the total mining reserves in the Proposed Action, which would shorten overall mine life by approximately 2.9 years. It was determined to be the maximum reduction in net percolation that Simplot could economically provide.

In light of the significant concerns expressed in the comments to the DEIS related to protecting quality of groundwater and particularly surface water, the potential issues related to fisheries impacts if the surface water is contaminated by the proposed operations, and the narrow margin of error between the predicted percolation of the "Base Case" and the acceptable net percolation; both Simplot and the Agencies have mutually agreed that the Minimum Net Percolation Store and Release Cover design would be adopted for Alternative D.

The selection of this design for Alternative D at Panels F and G does not necessarily set precedent for other phosphate mines in Southeastern Idaho. The cover design is specific to this project, its potential impacts, and the hydrogeological setting of the Smoky Canyon Mine and its unique connection between groundwater resources and nearby surface water.

The construction material to be used for the Alternative D store and release cover occurs in the lower shale member of the Dinwoody formation. Sufficient quantities of this material are available within the Panel F and G leases (**Figure 2.6-6**). Exploration drilling in the Panel F area indicates there would be approximately 3.63 MMBCY of Dinwoody formation resources within the overburden intended for removal from the existing pit plan. This would be more than twice the amount of Dinwoody required to build the cover for Panel F giving Simplot the ability to select/reject specific material if some were found unsuitable for use in the cover design. Although highly unlikely, if additional Dinwoody formation resources are required for this panel, more on-lease Dinwoody is available on approximately 86 acres immediately west of the pit highwall and could be accessed by laying back the proposed pit highwalls along this area. Dinwoody formation would be excavated from this borrow pit during the life of the Panel F mining activity. The same safety and environmental protection measures proposed for the phosphate mining operations would also apply to the Dinwoody formation borrow pits.

The Dinwoody material necessary for Panel G would be obtained on lease within the overburden of the proposed open pit. Exploration drilling indicates an in-place quantity of approximately 6.0 MMBCY of Dinwoody formation at Panel G. This is more than 2.7 times the amount of Dinwoody required to build the cover for Panel G. Additional Dinwoody resources could be obtained from the footprint area of the South External Overburden Fill and within two borrow pits totaling 25-acres to the south and west of the open pit (**Figure 2.6-6**). Dinwoody formation would be mined from the borrow areas with standard open-pit methods. The vegetation would be removed, and the suitable topsoil would be stockpiled for future reclamation of the borrow pits. Where the Dinwoody resources occur in the overburden that would be stripped prior to mining, stockpile areas in Panel F (18 acres) and Panel G (8 acres) have been situated on lease as displayed on **Figure 2.6-6**. The Dinwoody material would be mined, temporarily stockpiled as necessary, and hauled to the construction sites where it would be spread to the required thickness. When no longer required, any Dinwoody formation borrow pit areas would be regraded to maximum slopes of 3h:1v, topsoil would be added, and revegetated.

Figure 2.6-5 Alternative D-Store and Release Cover

Figure 2.6-6 Alternative D-Dinwoody Shale Borrow Pits and Stockpiles

Quantities of chert known to exist within the pit overburden of Panels F and G are larger than the Dinwoody formation quantities. Panel F is estimated to contain approximately 6.1 MMBCY of chert and Panel G more than 13.6 MMBCY. These quantities would provide in excess of 7 to 10 times more chert in these mine panels than is required for cover construction.

Reclamation activities would commence within about 18 months of beginning mining in Panel F and then would be concurrent with mining thereafter (**Table 2.4-1**). As the overburden fills are regraded to final slopes, the store and release cover would be constructed over all areas of seleniferous overburden fill. The chert layer would be placed first, followed by the Deep Dinwoody layer, the combined upper and lower Dinwoody layer, and then the topsoil layer. Constructing the cover concurrently with active mining would reduce the amount of time the ROM overburden is exposed to surface runoff and weathering effects and would also reduce the time period when infiltration of precipitation and runoff would be directly into the ROM overburden. This would reduce the overburden leaching at Panels F and G compared to previous mine panels at the Smoky Canyon Mine and would reduce the potential for development of overburden seeps at external overburden fills and seleniferous leachate entering the Wells formation under pit backfills.

The revegetation of the store and release cover would be as described elsewhere in **Sections 2.4** and **2.5** of this FEIS, except that there will be a greater emphasis on the density and diversity of the vegetation on the covers (i.e., more “islands of diversity”) to insure that the evapotranspirative properties of the cover are sufficient for the cover to function as designed. A critical part of a store and release cover is to establish a good growth medium that provides for a sustainable vegetation cover that is consistent with the final land use at the site (Okane Report No. 684-02). This likely includes establishing more plant species that are evergreen, will improve structural diversity, or are known to start their active growth early in the spring. Revegetation would also occur concurrently with ongoing mining operations. Timely revegetation of the topsoil on top of the store and release cover would reduce the net percolation into the underlying ROM overburden at Panels F and G compared to previous mine panels at the Smoky Canyon Mine.

Revegetation of the cover will follow adaptive management strategies as we gain more information concerning what plant species establish well on the site and are best suited for the cover to function as designed. With this alternative expect more efforts towards establishing trees (e.g. aspen, lodgepole, Douglas-fir) and shrubs (e.g. ceanothus, mountain snowberry, wild rose, mountain big sagebrush) that are known to establish well on drastically disturbed sites and are native to the area. For example, ceanothus is an evergreen shrub that has documented use for revegetation and is common in the area. Also snowberry is known to establish well and leafs out early in the spring (Paschke, M.W. et al 2002).

Quality control measures would include, among other observations, surveying and physical testing to ensure the cover had the specified characteristics to reduce annual infiltration to the amounts indicated by the infiltration modeling analysis for this alternative. Construction quality control monitoring and performance monitoring for the cover is described in **Appendix 2E**.

Laboratory testing of the material properties of Dinwoody resources that will be used in the construction of the Alternative D cover, along with extensive modeling studies indicate that the cover should perform as designed (Simplot 2007). Small-scale test pads have already been built using Panel E Dinwoody material to illustrate Simplot’s ability to work with the Dinwoody material (Simplot 2007). Large quantities of Dinwoody material from Panels F and G will not be available until mining of these panels commences so field-scale testing of this material is

currently not possible. To verify the ability of the mine staff to construct the cover with the thickness and material properties required by the design, at a minimum, two 2.5-acre test plots would be constructed early in the mining of Panel F when Dinwoody overburden is available. This is referred to as the Phase I field testing program, as discussed in the **Store and Release Cover Quality Control** section of **Appendix 2E**.

The test plots would be built on a 3:1 slope of regraded ROM overburden near Pit E-0. The Alternative D cover layers would be constructed according to the approved design. The as-built Dinwoody layers would be tested for material properties (moisture, density, gradation, thickness) to compare to the design requirements. The hydraulic conductivity of the as-built layers would also be tested in the field and compared to the design requirements. During construction of the test plots, the effect of increasing the degree of compaction on the resulting material properties would also be tested.

An objective of this test plot program is to develop field relationships between the material properties and the in-place hydraulic conductivity and obtain experience in constructing the cover to meet the design requirements. In the event that the required material properties and hydraulic conductivity are not initially achieved, additional construction methods would be tested, such as placing the Dinwoody in thinner lifts, adding more compaction, or disking the lifts before compaction. Another objective of this testing is to develop a detailed quality control plan for the rest of the Alternative D cover for Panels F and G, which would be based on experience gained in building the test plots (see **Section 2.10)**

The initial overburden removed from Panel F would be used to backfill Pit E-0 at Panel E. Following completion of the Pit E-0 backfill, it would be fitted with an Alternative D store and release cover that would be approximately 30 acres in size. This would comprise Phase II of the field testing for the cover design and would include use of the construction methods and detailed quality control plan developed from the Phase I testing. Within this cover, test cells would be constructed that would be instrumented for hydraulic performance monitoring. The main objectives of this monitoring would be: 1) observe and measure the water balance components for the test cells; 2) obtain field data to calibrate the model used to design the cover; 3) show that the cover is actually performing as predicted by the model results; and 4) develop an understanding of the key field characteristics and processes that control the hydraulic performance. This monitoring would include: site-specific meteorological conditions, precipitation, snow conditions, runoff, vegetation, erosion, cover material moisture storage and temperature, and net percolation through the cover. Information obtained from the Phase II test cells would be used to develop the detailed, performance-monitoring plan for the balance of the Panels F and G store and release cover (see **Section 2.10**). The monitoring of the test cells would extend through completion of the cover construction on Panels F and G and for an additional period of time to be established by the Agencies.

Alternative E –Power Line Connection from Panel F to Panel G Along Haul/Access Road In this alternative, electric power for the proposed mining operations would be provided with a 25kV, single-pole structure, power line extending southward along the selected haul/access roads from the existing power line in Panel E. The power line would be constructed within the footprint of the Agency Preferred haul/access roads (**Figure 2.6-7**). The power line would consist of approximately 30-foot tall single-pole wooden structures with a nominal span of approximately 330 feet. Approximately 16 pole structures per mile would be needed for straighter sections of the line, and more poles would be required to route the line around sections of the road having curvature.

Alternative F – Electrical Generators at Panel G – With the consideration of a separate power line corridor from Panel F to Panel G (under the Proposed Action and Alternative E), the Agencies decided to evaluate an alternative that would negate the need for any power line at all to Panel G through the use of generators located at the hot starts area of Panel G. The required generator capacity would be 1,100 to 1,200 kW. It would be powered by a 1,500 HP motor running continuously and using about 63 gallons of fuel oil per hour. For continuity of electrical service during normal maintenance and/or break downs, two such generator sets would be required, with one on automatic standby status at all times.

A separate oil tank would be added to the hot starts tank farm to hold the fuel for the generators and would be included within the secondary containment and SPCC procedures that would apply to the rest of the tanks.

2.6.2 Transportation Alternatives

The following Transportation Alternatives have been designed in response to scoping input and Agency concerns (**Figure 2.6-8a**). Comparisons of the disturbance characteristics for these alternatives are listed in **Table 2.6-5**. As described for the Proposed Action haul/access roads, portions of the alternative transportation corridors may be aligned across natural slopes steeper than 33 percent necessitating leaving portions of these corridors unreclaimed as indicated on **Figure 2.6-8b** and in **Table 2.6-5**.

TABLE 2.6-5 SUMMARY COMPARISON OF TRANSPORTATION ALTERNATIVE DIMENSIONS

#	ALTERNATIVE	LENGTH (MILES)	TOTAL ACRES	UNRECLAIMED ACRES	MILES IN IRAS *	ACRES IN IRAS *
1	Alternate Panel F Haul/Access Road	2.1	46	5	0.4	10
2	East Haul/Access Road	7.4	216	7	2.8	75
3	Modified East Haul/Access Road	8.4	276	21	4.5	141
4	Middle Haul/Access Road	6.4	192	34	6.2	189
5	Alternate West Haul/Access Road	8.0	226	28	4.7	131
6	Conveyor	6.1	61	0	5.3	53
7	Crow Creek/Wells Canyon Access Road*[1]	15.1	114	0	0.4	5
8	Middle Access Road	5.9	99	0	5.8	97

*Note: Miles and Acres in IRAs are only for the portions of the roads outside of existing lease boundaries, also includes topsoil stockpile areas.
*1 New disturbance only

Also similar to the Proposed Action, the alternative haul/access roads would have the same general road cross-section as described for the Proposed Action (**Figure 2.4-2**). The environmental protection measures and BMPs described for the Proposed Action haul/access roads would equally apply to each of the alternate haul/access roads.

Alternative 1 – Alternate Panel F Haul/Access Road - This road alternative would follow the same alignment as the Proposed Action from Panel E across South Fork Sage Creek to a point southeast of the creek crossing. From this point, this alternative alignment would be further to the west and south than the Proposed Action Panel F Haul/Access road connecting Panels E and F in order to completely avoid crossing any of the Sage Creek IRA outside existing leases (**Figure 2.6-9**). This alternative addresses scoping input that an alignment alternative should be considered for a road that avoids the IRA. A USFS SUA would be required for this alternative. It is shorter than the Proposed Action Panel F Access/Haul Road and would have 21 acres less disturbance. Because this road would enter the Panel F lease at a higher elevation than in the Proposed Action Panel F Haul/Access Road, the ore could not be extracted to as great a depth, and this alternative would result in the recovery of approximately 1.2 MM tons less phosphate ore than the Proposed Action.

Alternative 2 –East Haul/Access Road - This haul/access road alternative would connect Panels F and G via a route out of the south end of Panel G and then northward up the unnamed drainage immediately east of Panel G to a summit from which it would turn eastward down the north slope of Nate Canyon to the mouth of Deer Creek and then generally northward along the east face of the mountain range to join the access road between Panels E and F (**Figure 2.6-8a**). This alternative also addresses scoping input that an alignment alternative should be considered for a road that avoids the IRA, as well as reduced disturbance in the Deer Creek watershed. This haul/access road alternative would have the least amount of disturbed area in the Sage Creek IRA of the haul/access roads under consideration but would be the closest to the residents and visitors in the Crow Creek area (**Figure 2.6-8a**). This alternative has the fewest number of creek crossings of any of the alternatives.

Alternative 2 would require a 300-foot long culvert crossing of perennial Deer Creek, which is also a fishery, and would also require culvert crossings of the ephemeral drainage upstream of Quakie Hollow and Manning Creek.

The road corridor would extend along the entire east side of the Webster Range from Panel G to Panel E. This road would cross private land in the lower Deer Creek Canyon area, and a private landowner easement would be required for construction in this area.

Alternative 3 – Modified East Haul/Access Road – This alternative would avoid building the East Haul/Access Road (Alternative 2) on private land. This would be possible by installing switchbacks in the road within Deer Creek Canyon and crossing Deer Creek about one mile upstream of the Crow Creek Road stream crossing. The rest of this alignment would be the same as the East Haul/Access Road. Compared to the East Haul/Access Road, this modified road alignment would be less visible to persons along Crow Creek Road. It would also reduce the overall climb of the loaded haul trucks out of Deer Creek Canyon. Under this alternative, the crossing of Deer Creek would be accomplished with a 390-foot long culvert. It would involve constructing road cuts and fills in Deer Creek Canyon, which, although designed to minimize direct physical impacts to the stream, would also be difficult to fully reclaim (**Figure 2.6-8b**). The section of this road that would be located up Deer Creek Canyon would be constructed on

Figure 2.6-7 Alternative E-Power Line Along Haul/Access Road

Figure 2.6-8a Transportation Alternatives

Figure 2.6-8b Unreclaimed Areas for Transportation Alternatives

Figure 2.6-9 Transportation Alternatives with IRAs

steep (60+ percent), rocky side slopes that would require full bench (cut) construction and end hauling of material. This road would also have a greater length in the IRA compared to the East Haul/Access Road (**Table 2.6-3** and **Figure 2.6-9**).

Alternative 4 - Middle Haul/Access Road - This alternative, created to analyze the shortest route with the least disturbance, would connect Panels F and G with a haul/access road along the eastern slope of Freeman Ridge in the middle Deer Creek watershed area (**Figure 2.6-8a**). It would require road fills and culverts that are 440 and 510 feet long to cross the main and south forks of Deer Creek, respectively. Constructing this road in the steep sandstone slopes in this area would result in large road cuts and fills that would be more difficult to reclaim than the Proposed Action West Haul/Access Road and Alternative 2, the East Haul/Access Road. The sections of this road that would be located on steep (60+ percent) rocky side slopes would require full bench (cut) construction and end hauling of material. It is the shortest of the five haul/access roads from Panel G but has a disturbed area in the Sage Creek IRA greater than either the East or West Haul/Access roads (**Table 2.6-3**). It would be more isolated from the general public than the other two haul road routes but would impact the perennial North Fork Deer Creek watershed more than either of the other haul/access roads.

Alternative 5 –Alternate Panel G West Haul/Access Road – This would be an alternative alignment to the northern portion of the Proposed Action Panel G West Haul/Access Road. It would extend from the south end of Panel F along the north slope of North Fork Deer Creek and cross over into upper South Fork Sage Creek Canyon at Sage Meadow where it would join the Proposed Action Panel G West Haul/Access Road from Panel G. It would then course south through the Deer Creek and South Fork Deer Creek drainages to Panel G on the same corridor as the Proposed Action Panel G West Haul/Access Road. The main difference between this route and the Proposed Action Panel G West Haul/Access Road is that this alignment would disturb less of the South Fork Sage Creek watershed and eliminate the long, north-aspect road section in this area, allowing for easier winter maintenance (**Figure 2.6-8a**).

Alternative 6 - Conveyor from Panel G to Mill - This alternative would eliminate construction of a haul road connecting Panels F and G and would transport ore from Panel G to the mill with a conveyor along a 50-foot wide corridor (**Figure 2.6-8a**). This conveyor would be built from the staging area at Panel G down along the west edge of the Panel G pit, then down the south slope of Deer Creek Canyon to its bottom where it would span the creek, then course up the north slope of the canyon to Panel F. The conveyor would follow along the east side of Panel F and span South Fork Sage Creek upstream of the haul/access road from Panel E to F. It would then enter the Panel E disturbance area and generally follow the existing haul/access road from Panel E all the way to a crushed ore stockpile at the existing Smoky Canyon mill. A service road would be needed in conjunction with the conveyor; it would be a graded surface one-lane road, just wide enough for a service truck, and would parallel the conveyor. The service road would not cross Deer Creek or South Fork Sage Creek; rather it would terminate on either side of these creeks. The conveyor structure would span these creeks. The characteristics of this conveyor and its right-of-way are shown on **Figure 2.6-10**.

The Panel G ore would need to be dry crushed at Panel G before being placed on the conveyor. This crushing facility would consist of a ROM ore stockpile, a grizzly/hopper, and the crusher. Electric power for the Panel G facilities would be provided with a high voltage cable fixed to the conveyor support structure along the conveyor right-of-way. This alternative would have less surface disturbance than any of the haul/access road alternatives but would also require

implementation of either the Wells Canyon/Crow Creek access road (Alternative 7) or the Middle Access Road (Alternative 8).

One of these access roads (described below) would be required in conjunction with this alternative in order to transport equipment to Panel G and allow for employee, supply, and vendor access.

Alternative 7 - Crow Creek/Wells Canyon Access Road – Building the conveyor from Panel G would require construction of either this alternative or Alternative 8. This is because, in addition to hauling ore to the mill on the conveyor, equipment, personnel, and supplies would need to be transported to and from Panel G. This access function provided by any of the haul/access roads would be lost if the conveyor was built instead of a haul/access road. The Crow Creek/Wells Canyon Access Road would involve upgrading the existing Crow Creek county road from the mouth of Crow Creek Valley near Fairview, Wyoming to the mouth of Wells Canyon, a distance of approximately 15 miles (**Figures 2.6-11a and 2.6-11b**). Coordination and approvals from both county road departments in Wyoming and Idaho would be required. Upgrading the existing road would involve general grading, widening, and straightening the sharpest curves. Existing culverts would also need to be replaced with longer culverts. The final road surface would be 30 feet wide and covered with crushed rock for all-weather use. A new 30-foot wide access road would be built up Wells Canyon to the Panel G staging area from the Crow Creek road. This new road would be located on the north side of the canyon above the ephemeral stream channel in the canyon bottom, where much of the existing USFS road is currently located. Both Wells Canyon and Crow Creek Roads would remain open to public traffic under this alternative. Easements, rights-of-way, or private property acquisitions may be necessary to accommodate portions of the Crow Creek Road re-alignment and the east end of the Wells Canyon Road. After mining is completed, the Wells Canyon Road would be reclaimed back to a lower standard (20-24 feet wide), and the existing Wells Canyon Road would be decommissioned and reclaimed. The partially reclaimed, lower standard would serve as the permanent Forest Route 146. Portions of the Crow Creek Road that would be cut off during the realignment and upgrade would also be decommissioned and reclaimed following the construction of the new road.

Alternative 8 – Middle Access Road – Building the conveyor would require construction of either this alternative or Alternative 7. This alternative would involve building an access road from Panel G northward across South Fork Deer Creek, Deer Creek, and North Fork Deer Creek to enter Panel F on its south end (**Figure 2.6-8a**). It would then join the haul/access road along the length of Panel F. The final surface of this access road would be 50 feet wide and would be covered with crushed rock for all-weather use. The width of the road corridor disturbance would vary depending on the amount of cut and fill. The road would cross the various stream channels with culverts including a 580- and 360-foot long culvert, respectively, for the crossings of the Main and South Forks of Deer Creek. It would eliminate the impacts of road construction along Crow Creek and in Wells Canyon but, unlike the Crow Creek/Wells Canyon Access Road, would impact environmental resources of the Deer Creek watershed.

Figure 2.6-10 Conveyor Characteristics

Figure 2.6-11a Crow Creek/Wells Canyon Access Road-South Half

Figure 2.6-11b Crow Creek/Wells Canyon Access Road-North Half

2.6.3 No Action Alternative

Currently, the Existing Operations as described in **Section 2.3** form the baseline for the No Action Alternative. Under this alternative, Panels F and G would not be approved for mining, and none of the proposed Transportation or Mining Alternatives would be needed or implemented. This would eliminate the local environmental impacts from the mining of Panels F and G for the time being. The existing, approved mine panels would continue to be mined and reclaimed as currently permitted until these particular ore reserves are exhausted, at which point mining and milling operations at the Smoky Canyon Mine would cease, see **Section 2.3 Existing Operations**.

CEQ regulations require that an EIS include a "No Action" alternative. It is important to understand the full meaning of the "No Action" alternative in the case of mining phosphate leases at Smoky Canyon Panels F and G. A phosphate lease grants the lessee the exclusive right and privilege to explore for and mine the phosphate deposit on the leased lands, subject to the conditions provided in the lease. It also gives the lessee the right to use such surface of the leased lands as may be necessary for the development of the phosphate resource.

Phosphate leases are not cancelable by the United States, except by due process in the case where the lessee does not meet the terms and conditions of the lease. The No Action Alternative does not imply that the leases would never be developed, only that they would not be developed under this Mine and Reclamation Plan submittal. As the rights to mine the leased phosphate deposits have been acquired, if the No Action Alternative were selected, another Mine and Reclamation Plan for these two leases could be submitted in the future.

2.7 Alternatives Eliminated from Detailed Analysis

This section describes alternatives to the Proposed Action that were considered but were not adopted for consideration or detailed review. A range of alternatives to be evaluated in an EIS should meet certain key principles derived from NEPA case law including:

- The overall range of alternatives should be governed by the "rule of reason". When there are potentially a large number of alternatives, only a reasonable number of examples, covering a full spectrum should be analyzed.
- All alternatives considered must achieve the objectives of the Purpose and Need.
- Alternatives must be "reasonable," i.e., they must be technically and economically feasible.
- Alternatives that are speculative and geographically remote need not be considered.
- Alternatives with environmental impacts that are obviously worse than the Proposed Action or other alternatives under consideration can be eliminated.

The following alternatives that were removed from further evaluation in the EIS were eliminated for one or more of the above-listed principles. These alternatives and the reasons why they were eliminated from further consideration are briefly discussed in the following sections. If economic or technological considerations were to change significantly before certain portions of the ultimately selected alternative are implemented, then alternatives which are presently

considered infeasible may become feasible and could be reevaluated in the future in a separate NEPA document.

2.7.1 Eliminated Mining Alternatives

Underground Mining – Use of underground mining methods offers the potential benefit of eliminating the development of open pits and the associated overburden disposal issues. However, underground mining of phosphate ore has not been practiced in Southeastern Idaho or northeast Utah since 1976, and there are no underground phosphate mines currently operating in the United States. Additionally, Simplot's entire operation is set up to conduct surface mining. Underground mining would require outlays of capital for all new machinery. Extensive retraining would be required or new hiring of professional, technical, and labor personnel. The economics of modern open pit mining practices, by using more cost-efficient mining methods and equipment, allows for increased recovery of the phosphate resource compared to underground methods.

Underground mining is not without its own set of potential impacts that are not shared with open pit methods including:

- At this point in time, it is not a standard cost effective practice for phosphate mining in the Western U.S.,
- Increased safety hazards to mine workers,
- Increased mine worker population,
- Replacing surface miners with underground miners,
- Replacing surface mining equipment with underground mining equipment,
- Increased electrical power needs for mine ventilation and other equipment,
- Increased mining costs per ton of ore extracted,
- Potential long-term subsidence (caving) of ground over the mined out areas, and
- Interception of groundwater in underground openings.

This alternative was eliminated from further consideration because it is not considered to be economically feasible or practical and did not meet the Purpose and Need for continued economically viable development of federal phosphate resources.

Relocation of the Smoky Canyon Mill to Panel G – The need for transportation of Panel G ore across public land all the way to the existing Smoky Canyon Mill drives the need for the proposed ore transportation routes across the Sage Creek and Meade Peak IRAs. If the Panel G ore could be mined and milled locally at the mine panel, this would negate the need for the transportation of the ore north, and haul/access roads or conveyor across the IRAs could be eliminated. In addition, diesel fuel and other ore haulage costs would be conserved, and air emissions from this haul traffic would be eliminated. Some drawbacks of this alternative include:

- Off site transportation impacts from the Crow Creek/Wells Canyon access road would be greater for this alternative than Alternative 7 because mill employees and mill vendor deliveries would be added to the mine traffic.

- A larger power line (115 kV) would be needed to satisfy the electric motor horsepower of the relocated mill. This would require a currently unneeded new power line right of way from the Fairview substation to the Panel G location.
- Pipelines for water supply, beneficiated ore slurry, and tailings would have to be extended from the existing Smoky Canyon Mill site to the new Panel G mill. Thus, a pipeline transportation corridor between Panel G and the existing mill site would still be required.
- A new tailings pond would need to be located near Panel G with connecting tailings and reclaim water pipelines. It is unlikely that such a new tailings pond site would be readily available in the area. Because there is capacity in the currently operating, permitted ponds, this would result in unnecessary disturbance for relocating a tailings pond area.
- There would be an interruption in beneficiated ore delivery to the Don Plant while the Smoky Canyon Mill was relocated from Smoky Canyon to Panel G. This would result in a temporary shutdown of the Don Plant with consequent socioeconomic impacts.
- The capital expenditure necessary to relocate the mill and tailings impoundment is not economically feasible when compared with the amount of ore available in the Panel G lease.

This alternative was eliminated from further evaluation because it did not reasonably expand the range of alternatives already under consideration and did not comply with the Purpose and Need.

Enhanced Anoxic Attenuation in Pit Backfills - This alternative addresses scoping concerns over groundwater impacts from infiltration of precipitation into seleniferous pit backfills. Evidence from other mining locations and laboratory testing by Simplot indicates a potential for lower release rates of dissolved selenium in phosphate pit backfills where certain conditions of moisture content, atmospheric gas flux with low oxygen content (anoxic), and selenium-reducing microbial communities can be developed. At the present time, this type of contaminant attenuation is not considered likely in external overburden fills because of the lack of anoxic conditions.

Research is currently being conducted by Simplot and other companies to determine if such conditions can be developed and naturally maintained in the backfills of future phosphate pits. If this could be accomplished, the groundwater impacts of this mining approach could be lessened because the seepage being released from the pit backfills would contain a lower concentration of dissolved selenium. Adoption of this mitigative measure would not affect surface disturbance areas at the mine panels.

Although preliminary results of the research to date indicate attractive theoretical characteristics and benefits for this backfilling approach, the work has not progressed to the point where the effectiveness of this measure is predictable enough to be relied upon for environmental impact analyses. The Agencies have decided to not evaluate this alternative in detail in this document but retain the option to consider this approach in the future if and when the technology has developed to an appropriate point.

Impermeable Infiltration Barriers - Comments received on the DEIS suggested the Agencies evaluate applicability of infiltration barriers to the top and bottom of the overburden fills and this analysis was added to the EIS.

Constructing an impermeable infiltration barrier on top of the overburden fills would minimize penetration of water and oxygen into the overburden fills. This would reduce the generation rate of seleniferous leachate within the overburden. A synthetic infiltration barrier would have an extremely low permeability and could reduce net percolation to negligible levels, what little seleniferous leachate that was produced in the overburden fills would continue to percolate downward into the underlying Wells formation. This approach would result in extremely low net percolation rates through the overburden. Various materials could be used for the synthetic infiltration barrier and these have varying costs and efficiencies (Appendix 2C, BLM and USFS 2002). Construction would include more than just installation of the synthetic barrier at the top of the overburden fills. More complex fill placement would be required to avoid differential settlement that could tear the liner and compromise the integrity of the cover system. A suitable subgrade of crushed stone would need to be produced and installed under the synthetic barrier to prevent puncturing the barrier from ROM overburden particles. Another protective layer of fine-crushed stone or a geosynthetic fabric would need to be placed on top of the synthetic barrier to protect it. The barrier would then need to be covered with suitable thickness of subsoil and topsoil to support post-mining land uses.

Constructing an infiltration barrier beneath the overburden fills is another potential approach to minimizing introduction of contaminated seepage into the underlying groundwater. Impermeable infiltration barriers are commonly built under heap leach facilities in the metals mining industry. Again the synthetic barrier would need to be installed on top of a prepared foundation of fine-crushed rock and covered with a cushioning layer of similar fine-crushed rock to protect it from the impact of ROM overburden placed over it. Building such infiltration barriers on the steep (2.5h:1v) footwalls of the open pits would be technically difficult and some design would need to be developed to carry this lining part way up the steeper (0.9h:1v) hanging walls of the pits. In the metals mining business, heap leach liners are typically not placed on steep slopes for slope stability reasons to protect the material on top of the lining from moving down the liner and possibly tearing the synthetic barrier material.

Constructing an infiltration barrier beneath the overburden fills would not reduce penetration of water and oxygen into the overburden, thus a larger amount of seleniferous leachate would be produced than if infiltration into the overburden was reduced at its top surface. In the case where the infiltration barrier was built beneath the overburden, selenium leachate would accumulate within the overburden and would eventually need to be removed by drainage or pumping. The amount of this seepage accumulation would be significant due to unrestrained net infiltration from the ground surface and would likely have selenium concentrations exceeding the surface water criterion (0.005 mg/L). This could not be discharged to surface streams without first being treated. This wastewater treatment cost would be considerable and would have to continue for a long period of time. Building a suitable barrier to infiltration on top of the overburden fills is considered to be preferable to the Agencies because it would: 1) reduce the amount of seleniferous seepage produced at the source in the overburden and, 2) eliminate the need for the long-term treatment of wastewater removed from the overburden fills.

Use of synthetic infiltration barriers at the Smoky Canyon Mine site was evaluated for the Panels B and C SEIS (Appendix 2C, BLM and USFS 2002). That 33-page report, “Infiltration Barriers – Review of Feasibility for the Smoky Canyon Mine” included a review of the applicability of bentonite amendments, geosynthetic clay liner (GCL), polyethylene membranes, PVC membranes, and sprayed asphalt. The potential application of each of these techniques to construct an impermeable infiltration barrier on top of overburden fills at the mine were discussed. The known technical limitations and economic ramifications of using each method

were also reviewed. The costs for these synthetic infiltration barriers were evaluated in detail in the report and the total costs ranged from about $45,500 to $67,300 per acre, depending on the design and materials of the barrier. These costs were determined to be too high to be economically feasible for the 244 acres of external overburden fills at the Panels B and C mining operation and the agencies concluded these were not reasonable mitigative alternatives for large areas of overburden fills like those proposed for the Smoky Canyon Mine (BLM and USFS 2002). Because of the proximity of the proposed Panels F and G to the Panels B and C operations at the Smoky Canyon Mine, and the close similarity in operating conditions and design objectives, the Agencies consider the technical analysis of infiltration barriers conducted for Panels B and C less than five years ago to be applicable to Panels F and G. Inflating these same costs by 5% annually for 2003 through 2006 would result in total costs to cover 819 acres of seleniferous overburden at Panels F and G ranging from about $55,300 to $81,800 per acre. The Agencies have evaluated these costs and determined that they are economically unfeasible for a commercial phosphate mining operation at Smoky Canyon and therefore are not reasonable to include in action alternatives for Panels F and G.

2.7.2 Eliminated Transportation Alternatives

Tunnel from Panel F to Panel G – This alternative would involve construction of a tunnel from Panel F to Panel G for a conveyor to transport ore. Such a long tunnel would be prohibitively expensive to construct and would expose mine workers to hazards from underground mining. This action would also have significant groundwater quantity impacts because the tunnel would be lower than the water table under Deer Creek, and the dewatering of the tunnel could remove significant amounts of groundwater from this area. Such dewatering could reduce natural groundwater discharge in lower Deer Creek Canyon. This is not considered to be an economically feasible alternative for many of the same reasons as the Underground Mining Alternative discussed above.

Haul/Access Road Down and Back Up Deer Creek – This alternative would require building a haul/access road down the south-facing slope of Deer Creek Canyon from Panel F, crossing lower Deer Creek with a road fill, and then building the haul/access road back up the north slope of Deer Creek Canyon to Panel F. This route was conceptually evaluated by Simplot and is discussed in their April 21, 2003 mine plan submittal. The extensive road cuts produced by this road alignment would be in solid rock on the extremely steep canyon slopes on both sides of Deer Creek Canyon and would affect much of the length of the canyon. Such road cuts and fills would have major visual impacts and would be practically impossible to reclaim back to topographic and aesthetic values. Extensive road fills would expose much of Deer Creek to sedimentation impacts from erosion of disturbed surfaces. This alternative was eliminated from further evaluation because it did not reasonably expand the range of alternatives already under consideration, and it had obvious environmental and operational impacts that were worse than the Proposed Action and the other alternatives already under evaluation.

1400-Foot Culvert Haul/Access Road from Panel E to Panel F – This alternative would involve building a haul/access road up the north side of South Fork Sage Creek Canyon to the north end of the pit in Panel F. This alternative was conceptually evaluated in the April 21, 2003 Simplot mine plan. The steep and rocky canyon walls would require large cuts and fills to construct the road. The road cuts would be practically impossible to reclaim close to original contour. Approximately 1,400 feet of South Fork Sage Creek would need to be placed in a culvert under the road fill, which would negatively impact stream hydrological functions in this

long reach during mine operations. Reclamation of this road would be extremely difficult because of the amount of fill and cut that would need regrading and revegetation treatment. Approximately 1,400 feet of culvert would be removed, and the stream channel in this reach would need to be reconstructed. This alternative was eliminated from further evaluation because its environmental impacts were obviously worse than the Proposed Action road connecting Panels E and F or the alternatives already under consideration.

Conveying Ore from Panel F to Mill – This alternative was discussed in the April 21, 2003 Simplot mine plan submittal. This action would eliminate the need for a haul road from Panel E to Panel F, but a conveyor corridor and access road would still need to be constructed. The conveyor would increase capital costs for the Project and also eliminate the ability to backfill Panel E with Panel F overburden because overburden cannot be transported on the conveyor. A larger external overburden disposal site would be required for the initial pits in Panel F that is not required if this overburden is hauled back to Panel E for backfilling purposes. This alternative was eliminated from further evaluation because its main environmental impacts (not backfilling Panel E and a larger external overburden fills) were obviously worse than the Proposed Action or other alternatives already under consideration.

Hauling Ore from Panel G with Commercial Trucks on Public Roads – This alternative requires the use of a contractor to operate highway-legal trucks and trailers to haul ore down a new Wells Canyon haul/access road, out a widened Crow Creek Road to Star Valley, north up Star Valley to the Stump Creek Road, along the existing access road in Tygee Valley, and up the Smoky Canyon Road to the Smoky Canyon Mill. Such trucks are now widely used in Nevada to transport large quantities of gold ore over large public roads. This alternative could be less costly in capital but more costly in operating costs for Simplot than any of the other haulage alternatives. It would have less disturbance-type environmental impacts than any of the haul road alternatives that cross the Sage Creek IRA because it would not require building roads across the Forest. There would be new disturbance from widening and re-aligning the existing roads along the haulage route. It would have greater air emission impacts from the exhaust of the greater number and longer truck trips needed to move the ore with lower efficiency and greater fuel consumption than using 150-ton mining trucks as included in the Proposed Action and Panel G transportation alternatives evaluated. It would have the greatest off-site (i.e., on public roads) transportation impacts (noise, dust, safety, and road maintenance) of any of the transportation alternatives and would also require construction of the Wells Canyon haul/access road and a much wider Crow Creek Road to accommodate all the truck traffic. This alternative would have the greatest impacts on residents and the public along Crow Creek and would add considerable transportation impacts to residents and the public in Star Valley, along Stump Creek Road, and in Tygee Valley that would not be present in any of the other transportation alternatives. This alternative was eliminated from further evaluation because its environmental impacts (primarily to public transportation and safety) were obviously worse than the Proposed Action or other alternatives already under consideration.

Haul/Access Road East of Sage Creek IRA from Panel G – This alternative would involve building a haul/access road down Wells Canyon, then north parallel to the Crow Creek Road to approximately Deer Creek where it would join the already proposed East Haul/Access road alignment. It would have less environmental impacts on the Sage Creek IRA than any of the other mine truck haulage alternatives and addresses concerns related to road building within the IRA. It would have greater impacts on the residents and public in the southern portion of Crow Creek Valley than the other East Haul/Access Road alternatives already under consideration.

This road would cross more private land with multiple owners than the other East Haul/Access Road alternatives, and landowner permission would be required. This alternative was eliminated from further evaluation because its environmental impacts to residents and the public in Crow Creek Valley were obviously worse than the Proposed Action or other alternatives already under consideration.

Haul/Access Road in Upper North Fork of Deer Creek Canyon from Panel G – This alternative would consist of a road built from the south end of Panel F roughly west into the upper watershed of North Fork Deer Creek and through the unnamed topographic pass across Freeman Ridge to join the West Haul/Access Road. This route would present major disturbance impacts in the upper portion of the North Fork Deer Creek watershed and would require construction of a high-elevation crossing of the south end of Freeman Ridge where no road access currently exists. This alternative was eliminated from further evaluation because its environmental impacts to the North Fork Deer Creek watershed were obviously worse than the Proposed Action or other alternatives already under consideration.

Slurry Pipeline From Panel G to the Mill - This alternative would involve transporting ore from Panel G to the existing Smoky Canyon Mill facility with a buried slurry pipeline similar to that currently used to transport phosphate concentrate from the Mill to Pocatello. A slurry pipeline would consist of an 8 to 10-inch diameter steel pipe buried 4-feet deep in a trench along the pipeline corridor. Pipeline construction would temporarily disturb the pipeline corridor, but most of this disturbance would immediately be reclaimed. Pipeline construction activities would be confined to a 50-foot wide right-of-way. A new 115kV power line would need to be built into Panel G from Fairview, Wyoming. This power line would extend from the existing substation near Fairview, Wyoming to Panel G, along an undetermined route.

One pipeline route that was considered went down Wells Canyon from Panel G to the Crow Creek Road then along that road to the Manning Canyon Road and north along an existing USFS road to South Fork Sage Creek Canyon where it would cross the creek and follow existing haul roads to the Smoky Canyon Mill. A second route considered went west from Panel G along the existing USFS road in South Fork Deer Creek Canyon then north along the Diamond Creek Road to Timber Creek, and then east over the summit between Timber and Smoky Creeks to the Smoky Canyon Mill. Finally, a third route was considered that crossed the Sage Creek IRA between Panels F and G and then followed the haul road from Panel F to the Mill.

Ore from Panel G would be ground in a mill located at Panel G. The ore/water slurry would be pumped into agitated slurry surge tanks at the grinding mill and then into the head end of the slurry pipeline. Slurry would exit the pipe at the existing Smoky Canyon Mill into a set of slurry surge tanks. Slurry would be introduced from these tanks into the existing Smoky Canyon Mill for beneficiation. Water would be pumped from a 1,000-gpm well at Panel G to the Panel G SAG mill facility. Water from a surge tank at Panel G would be introduced into the mill to mix with ore as it is ground. Approximately 750 gpm of water would be used to grind and slurry the ore. This water would be shipped to the Smoky Canyon Mill with the ore slurry and would replace an equal amount of water in the water balance for that facility. There would be no planned discharge of either slurry or water to the environment at any point along the proposed slurry pipeline system.

An access road for mine workers and suppliers would need to be constructed into Panel G for this alternative. Options for this access road would consist of either Transportation Alternative 7 or 8 as previously described in this document.

The environmental benefits of this alternative include: potential minimization of disturbance impacts to IRAs, immediate reclamation of most of the disturbed area along the pipeline corridor, reduction of long-term impacts to streams because the pipeline would be placed under the stream channels, and minimal impacts to persons and wildlife during pipeline operations.

This alternative has the following economic and environmental problems:

- Approximately 10 percent of the phosphate value in the ore would be lost at the Smoky Canyon Mill because a fine fraction of the high-grade ore would be lost in the mill circuit and would be discharged to the tailings pond instead of being captured and pumped to Pocatello.
- To compensate for the reduced phosphate recovery at the Mill, the Panel G mine plan would need to be redesigned to only mine higher-grade material, resulting in a lower overall ore recovery than the Proposed Action.
- The overall reduction in recovered P_2O_5 from the Panel G mine would be approximately 350,000 tons, which equates to a loss to the economy of $62,000,000.
- Royalties paid to the federal government, and partially distributed to the state and local economies would be reduced.
- Net additional costs for this alternative (after capital and operating costs are considered) over the Proposed Action and other transportation alternatives are approximately $34,000,000.
- The net additional costs stated above do not include approximately $5,000,000 for construction of a 115kV power line.
- The slurry line would require operation of a 1,000 gpm water well at Panel G that would require additional water rights and would remove an average of 750 gpm of groundwater (1,210 acre-feet per year) from the Deer Creek watershed.

Over the relatively short life of this type of development, Simplot would not recover the capital costs of this alternative. Economic analysis of similar projects have shown that a slurry pipeline operation has a greater capital cost in the beginning with lower operational costs over time. Under the right circumstances, the long-term operation of a pipeline is both economically practical and feasible. However, the few years that this mine would operate and with the poorer ore quality in Panel G, it cannot support a slurry alternative. After a detailed economic and technical review by Agency engineers, this alternative was eliminated from further consideration because it was not economically or technically feasible and did not comply with the Purpose and Need.

West Access Road via Timber Creek, Diamond Creek, and SF Deer Creek – This would be an alternative to the Crow Creek/Wells Canyon Access Road or the Middle Access Road for access to Panel G as part of the conveyor ore transportation alternative. It would involve upgrading the existing upper Wells Canyon, Diamond Creek, and Timber Creek roads by widening and straightening for use as year-round access for both vendor delivery and employee vehicles from the existing Smoky Canyon Road. This alternative would reduce transportation impacts to the Crow Creek and Wells Canyon areas, but would dramatically increase public

traffic on the Timber Creek, Diamond Creek, and upper Wells Canyon roads that are currently used primarily for recreation. This alternative would not require construction across the Deer Creek drainage within the Sage Creek IRA, but would increase public access to the margins of the IRAs along its route.

The existing USFS roads to be widened under this alternative already border on riparian, wetland, and perennial aquatic habitats along Deer Creek, Diamond Creek, and Timber Creek. Widening of the roads in these areas would have direct impacts to these resources during road construction. Increased vehicle use of the roads year-round would have the potential for increased sedimentation impacts to the aquatic habitats. A dramatic year-round increase in vehicle traffic on these roads would interfere with the current recreational users and likely increase recreational access to the IRAs along the route. This alternative was eliminated from further evaluation because its environmental impacts (to riparian and aquatic resources and recreation access) were obviously worse than other employee/vendor access routes associated with non-haul truck road related transportation alternatives already under consideration.

2.8 Features Common to the Proposed Action and Action Alternatives

The following features are common to the Proposed Action and all Action Alternatives. Some of these features are not applicable to the No Action Alternative.

- Mining of Panels F and G ore bodies would use the same methods as currently used.
  - Operation of the mill, concentrate slurry pipeline, and tailings ponds would continue in the same manner as currently practiced.
  - Operation of the Smoky Canyon administrative, maintenance and support facilities would continue as currently practiced.
- There would be new stream crossings of South Fork Sage and Deer Creeks and associated tributaries.
- There would be projected continued employment of approximately 210 persons at the mine, not including persons employed at the Pocatello fertilizer plant.
- Consumption of electricity, petroleum, reagents, and supplies would continue at approximately the current rate.
- All surface disturbances would be reclaimed in accordance with federal, state, and local regulations.
- Environmental protection measures, BMPs, and monitoring activities currently used would be practiced at the new operations.

2.9 Summary Comparison of Alternatives

Table 2.9-1 provides a tabular summary and comparison of impacts from the mining components of the Proposed Action and the Mining Alternatives (A – F). **Table 2.9-2** provides a tabular summary and comparison of impacts from the transportation components of the Proposed Action and the Transportation Alternatives (1 – 8). Detailed descriptions of impacts for specific resources are included in **Chapter 4**.

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**STORE & RELEASE COVER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
GEOLOGY AND TOPOGRAPHY												
Disturbed Acres	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres Seleniferous Overburden	435	384	0	819	817	681	725	763	819	Same as PA Total	Same as PA Total	0
External O/B Disposal	Yes	Yes	NA	Yes	Yes	Yes	Yes	No	Yes	Same as PA	Same as PA	No
Acres Not Reclaimed	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
Chert/Soil Cover	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	Yes	Same as PA	Same as PA	NA
AIR AND NOISE												
Tons Total Emission	3,705	4,717	Negligible	8,422	8,413	7,500	8,546	8,695	8,613	Same as PA Total	9,786	0
dBA Noise add to Crow Creek Area	52	50	Helicopter	50 - 52	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	None
WATER RESOURCES												
% Crow Ck. HUC 5 Dist.	0.5	0.5	Negligible	1.0	0.5	0.3	Same as PA Total	Same as PA Total	1.3	Same as PA Total	Same as PA Total	0
% Reduction SF Sage Watershed[1]	8	0	Negligible	8	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	9	Same as PA Total	Same as PA Total	0
% Reduction Manning Watershed[1]	6	0	Negligible	6	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	9	Same as PA Total	Same as PA Total	0
% Reduction Deer Ck. Watershed[1]	2	3	Negligible	5	Same as PA Total	3	Same as PA Total	Same as PA Total	6	Same as PA Total	Same as PA Total	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**STORE & RELEASE COVER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
WATER RESOURCES												
% Reduction Wells Cyn. Watershed[1]	0	11	Negligible	11	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	12	Same as PA Total	Same as PA Total	0
Springs Impacted[2]	9	11	0	20	Same as PA Total	16	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	0
Exceed GW Standard	Yes	Yes	NA[3]	Yes	Yes	Yes	Yes	Yes	No	NA	NA	No
Exceed SW Standard	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	NA	NA	No
SOILS												
Acres Soil Disturbance	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres Not Reclaimed	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
VEGETATION												
Acres Forest Disturbed	466	472	21	959	957	841	Same as PA Total	Same as PA Total	1,093	938	938	0
Acres Sage Disturbed	41	30	2	73	Same as PA Total	53	Same as PA Total	Same as PA Total	75	71	71	0
Acres Aspen Disturbed	268	161	17	446	Same as PA Total	345	Same as PA Total	Same as PA Total	540	429	429	0
Acres not Reclaimed	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
WETLANDS												
Feet Waters of U.S. Dist.	8,750	2,850	0	11,600	Same as PA Total	10,500	Same as PA Total	Same as PA Total	12,470	Same as PA Total	Same as PA Total	0
Acres Wetlands Disturbed	0.60	0.39	0	0.99	Same as PA Total	0.42	Same as PA Total	Same as PA Total	1.39	Same as PA Total	Same as PA Total	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**STORE & RELEASE COVER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
WILDLIFE												
Acres of Wolf and Lynx Habitat Disturbed	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres of Raptor and Owl,Habitat (Forest) Disturbed	466	472	21	959	957	841	Same as PA Total	Same as PA Total	1,093	938	938	0
Acres of Sage Habitat for Migratory Birds and Grouse Disturbed	41	30	2	73	Same as PA Total	53	Same as PA Total	Same as PA Total	75	71	71	0
Acres of Riparian Habitat for Migratory Birds, Bats and Amphibians Disturbed	0.5	0.4	0.3	1.2	Same as PA Total	0.7	Same as PA Total	Same as PA Total	1.6	0.9	0.9	0
Acres of Disturbance within the Reported Western Toad Migration Distance Area	320	0	9	329	329	191	Same as PA Total	Same as PA Total	406	320	320	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**STORE & RELEASE COVER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
FISHERIES AND AQUATICS												
Feet of Intermittent Channel Disturbed	12,187	5,443	2,719	20,350	20,329	17,202	Same as PA Total	Same as PA Total	22,239	17,631	17,631	0
Acres AIZs Disturbed	30.3	15.0	4.5	49.8	49.7	40.4	Same as PA Total	Same as PA Total	55.6	45.3	45.3	0
SW Standard for Selenium Exceeded	Yes	Yes	NA	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
LIVESTOCK GRAZING												
Acres of Allotments Disturbed	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Water Sources Impacted	9	11	0	20	Same as PA Total	16	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	0
RECREATION												
Acres of RM and SPM ROS Areas Disturbed[4]	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Forest Trails Disturbed	401 402	404	None	401 402 404	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	0
Big Game Hunt Area Temporarily Reduced	Yes	Yes	No	Yes	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**STORE & RELEASE COVER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
INVENTORIED ROADLESS AREAS												
Acres On - / Off-lease Disturbance in SCRA	355 160	380 34	8 13	743 207	743 191	743 69	Same as PA Total	Same as PA Total	838 207	722 207	722 207	0
Acres On- / Off-lease Disturbance in MPRA	0 0	25 0	1 0	26 0	Same as PA Total	Same as PA Total	Same as PA Total	Same as PA Total	32 0	25 0	25 0	0
VISUAL / AESTHETICS												
Acres of Modification and Partial Retention Disturbed	515	513	28	1,056	1,054	918	1,056	1,056	1,193	1,028	1,028	0
Acres of Permanent Disturbance	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0
CULTURAL RESOURCES												
Cultural Sites Impacted	None	Site CB-342	None	Site CB-342	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	None
Heritage Impacts	Minor - Moderate	Minor - Moderate	None	Minor - Moderate	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	None
NATIVE AMERICAN CONCERNS												
Acres of Temporary Access Loss	515	513	28	1,056	1,054	918	Same as PA Total	Same as PA Total	1,193	1,028	1,028	0
Acres of Unreclaimed Disturbance	38	8	0	46	Same as PA Total	17	38	0	Same as PA Total	Same as PA Total	Same as PA Total	0

TABLE 2.9-1 COMPARISON SUMMARY OF THE MINING COMPONENTS OF THE PROPOSED ACTION AND THE MINING ALTERNATIVES (Cont'd)

	PROPOSED ACTION (PA)				ALTERNATIVE A		ALT. B	ALT. C	ALT. D	ALT. E	ALT. F	
IMPACT	**PANEL F**	**PANEL G**	**DIRECT POWER LINE**	**PA MINING TOTAL**	**NO N. LEASE MOD.**	**NO. S. LEASE MOD.**	**NO SEL. EXTERNAL OVERBDN**	**NO EXT. OVERBDN**	**STORE & RELEASE COVER**	**POWER LINE ON ROADS**	**NO POWER LINE**	**NO ACTION**
SOCIOECONOMICS												
Years of Potential Employment	NA	NA	NA	16	15.5	14.2	12.8	8.3	13.1	Same as PA Total	9.5	0
Estimated Ore Reserves Reduction	NA	NA	NA	NA	Reduced by 3%	Reduced by 10.7%	Reduced by 19.3%	Reduced by 46%	Reduced by 18%	Same as PA Total	Reduced by 38%	None
Reduction in Royalty Payments[5]	None	None	NA	None	800 to 1,000	2,900 to 3,600	5,100 to 6,400	12,300 to 15,400	4,700 to 5,800	None	10,400 to 13,000	No Royalty Income
Potential Effect on Crow Creek Property Values	Minor	Minor	Negligible	Minor	Minor	Minor	Minor	Minor	Minor	Negligibl e	Negligible	None
TRANSPORTATION												
Change in Public Traffic Volume	None	None	None	None	None	None	None	None	None	None	Add 50 Vendor Deliveries	None
ENVIRONMENTAL JUSTICE												
	None	None	None	None	None	None	None	None	None	None	None	None

[1]Percent reduction in contributing watershed area due to pits and overburden storage areas.
[2]Includes springs that would be physically disrupted, potentially reduced in flow, or affected in water quality.
[3] Not applicable
[4] RM = Roaded Modified, SPM = Semi-primitive Motorized, ROS = Recreation Opportunity Spectrum
[5] $1,000s
AIZ = Aquatic Influence Zone

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	PANEL F HAUL/ACCESS ROAD	PANEL G HAUL/ACCESS ROAD	ALT. 1 ALT. PANEL F	ALT. 2 EAST PANEL G	ALT. 3. MOD. EAST	ALT. 4 MIDDLE HAUL	ALT. 5 ALT. WEST	ALT. 6 CONV.	ALT. 7 CROW - WELLS	ALT. 8 MIDDLE ACCESS	NO ACTION
GEOLOGY AND TOPOGRAPHY											
Disturbed Acres	67	217	46	216	276	192	226	61	114	99	0
Acres Not Reclaimed	4	21	5	7	21	34	28	0	55	0	0
AIR AND NOISE											
Tons Total Emission	1,207	1,504	960	1,460	1,564	1,358	1,522	661	824	632	0
dBA Noise add to Crow Creek Area	52.4	None	52.4	71.5	71.5	50.6	None	40	70	None	None
WATER RESOURCES											
% Crow Ck. HUC 5 Dist.	0.1	0.2	<0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0
Acres Deer Ck. Watershed Disturbed	0	112	0	23	83	162	155	29	1	79	0
Culverts in Perennial Streams	0	2	0	1	1	0	2	0	4	0	0
Culverts in Intermittent Channels	1	5	3	10	10	14	9	2	21	14	0
Tons / Year Sediment	0.5	8.5	0.7	4.5	5.1	7.8	10.7	0.4	1.0	2.1	0
Acres Meade Pk. Shale Disturbed	0	10	0	3	3	10	10	2	1	9	0
Springs Impacted[1]	0	2	0	1	1	1	2	0	0	2	0

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
SOILS											
Acres Soil Disturbance	67	217	46	216	276	192	226	61	114	99	0
Acres not Reclaimed	4	21	5	7	21	34	28	0	55	0	0
Reveg. Limitation	Slight to Severe	Moderate to Severe	Slight to Severe	Slight to Severe	Slight to Severe	Mod. to Severe	Mod. to Severe	Slight to Severe	Slight to Severe	Mod. to Severe	None
Cut Slope Stability Hazard	Low to Moderate	Low to moderate	Low to Mod.	Low to High	Low to High	Low to Mod.	Low to Mod.	Low to Mod.	Low to Mod.	Low to Mod.	None
VEGETATION											
Acres Forest Disturbed	59	203	44	139	171	153	185	50	9	75	0
Acres Sage Disturbed	7	2	1	55	61	12	4	7	76	5	0
Acres Aspen Disturbed	47	65	35	95	105	115	90	24	9	58	0
Acres not Reclaimed	4	21	5	7	21	34	28	0	55	0	0
WETLANDS											
Feet Waters of U.S. Dist.	230	540	230	300	390	1,200	490	0	162	940	0
Acres of Wetlands Disturbed	0	1.43	0	0.62	0.67	0.07	1.43	0	20	0.62	0
WILDLIFE											
Possible Habitat Fragmentation	Big Game Amphibians	Big Game Amphibians	B Game Amphibs	B Game Amphibs	B Game Amphibs	B Game Amphibs	B Game Amphibs	B Game	B Game Amphibs	B Game Amphibs	None
Risk of Collisions w/ Wildlife	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	PANEL F HAUL/ACCESS ROAD	PANEL G HAUL/ACCESS ROAD	ALT. 1 ALT. PANEL F	ALT. 2 EAST PANEL G	ALT. 3. MOD. EAST	ALT. 4 MIDDLE HAUL	ALT. 5 ALT. WEST	ALT. 6 CONV.	ALT. 7 CROW - WELLS	ALT. 8 MIDDLE ACCESS	NO ACTION
WILDLIFE											
Acres of Wolf and Lynx Habitat Disturbed	67	217	46	216	276	192	226	61	114	99	0
Acres of Raptor and Owl Habitat (Forest) Disturbed	59	203	44	139	171	153	185	50	9	75	0
Acres of Sage Habitat for Migratory Birds and Grouse Disturbed	7	2	1	55	61	12	4	7	76	5	0
Acres of Riparian Habitat for Migratory Birds, Bats and Amphibians Disturbed	0.7	0.8	0.7	1.9	0.8	0	0.8	1.5	24	0.6	0
Acres of Disturbance within the Reported Western Toad Migration Distance Area	0	120	0	0	0	116	119	14	0	72	0

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	PANEL F HAUL/ACCESS ROAD	PANEL G HAUL/ACCESS ROAD	ALT. 1 ALT. PANEL F	ALT. 2 EAST PANEL G	ALT. 3. MOD. EAST	ALT. 4 MIDDLE HAUL	ALT. 5 ALT. WEST	ALT. 6 CONV.	ALT. 7 CROW - WELLS	ALT. 8 MIDDLE ACCESS	NO ACTION
FISHERIES AND AQUATICS											
Feet of Intermittent Channel Disturbed	230	450	672	2,684	2,851	3,613	662	1,682	883	2,702	0
Feet of Perennial Channel Disturbed	0	475	0	290	275	0	475	0	2,086	0	0
Acres AIZs[2] Disturbed	0.7	14.9	1.7	4.7	10.1	9.2	15.4	6.2	11	9.7	0
Culverts in Perennial Channels	0	(1) 280' (1) 260'	0	(1) 300'	(1) 390'	0	(1) 280' (1) 260'	0	185', 105', 75, 70'	0	0
Tons / Year Sediment	0.5	8.5	0.7	4.5	5.1	7.8	10.7	0.4	1.0	2.1	0
LIVESTOCK GRAZING											
Acres of FS Allotments Disturbed	67	217	46	162	233	192	226	61	38	99	0
Water Sources Impacted	0	2	0	1	1	1	2	0	0	2	0
Hindrance to Livestock Movement	Low	Low	Low	Mod.	Mod.	Low	Low	Severe	None	Low	None
RECREATION											
Acres of RM and SPM ROS Areas Disturbed[3]	67	217	46	216	276	192	226	61	114	99	0
Forest Trails and Roads Cut or Disturbed	405 FR179	092 093 102 402 403 FR146	405 FR179	093 402	093 402	093 102 402 403 404	092 093 102 402 403 FR146	402 404	Old FR146	093 102 402 403 404	None

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	PANEL F HAUL/ACCESS ROAD	PANEL G HAUL/ACCESS ROAD	ALT. 1 ALT. PANEL F	ALT. 2 EAST PANEL G	ALT. 3. MOD. EAST	ALT. 4 MIDDLE HAUL	ALT. 5 ALT. WEST	ALT. 6 CONV.	ALT. 7 CROW - WELLS	ALT. 8 MIDDLE ACCESS	NO ACTION
INVENTORIED ROADLESS AREAS											
Acres On - / Off-lease Disturbance in SCRA[4]	5 19	2 64	10 0	15 59	15 125	34 155	39 58	31 22	5 0	22 75	0
Acres On- / Off-lease Disturbance in MPRA[5]	0 0	2 32	0 0	0 0	0 0	0 0	2 32	0 0	0 0	0 0	0
VISUAL AND AESTHETICS											
Acres of Modification and Partial Retention Disturbed	67	217	46	216	276	192	226	61	114	99	0
Acres of Permanent Disturbance	4	21	5	7	21	34	28	0	55	0	0
Disturbance Visible from Trail or Forest Route	092 402 404 FR179	092 093 102 403 404 FR146 FR1102	092 402 404 FR179	093 402 FR111 FR146 FR 740	093 402 FR111 FR146 FR 740	093 102 403 404 FR146	092 093 102 403 404 FR146 FR1102	092 093 402 404 FR146	093 FR111 FR146 FR740	093 102 403 404 FR146	None
CULTURAL RESOURCES											
Cultural Sites Impacted	None	CB-317 CB-342	None	CB-342	CB-342	None	CB-317	None	CB-342	None	None
Heritage Impacts	Negligible	Negligible	Same as PA	Minor to Moderate	Minor to Moderate	Same as PA	Same as PA	Same as PA	Same as PA	Same as PA	None

TABLE 2.9-2 COMPARISON SUMMARY OF THE TRANSPORTATION COMPONENTS OF THE PROPOSED ACTION AND THE TRANSPORTATION ALTERNATIVES (CONT'D)

	PROPOSED ACTION (PA)		TRANSPORTATION ALTERNATIVES								
IMPACT	**PANEL F HAUL/ACCESS ROAD**	**PANEL G HAUL/ACCESS ROAD**	**ALT. 1 ALT. PANEL F**	**ALT. 2 EAST PANEL G**	**ALT. 3. MOD. EAST**	**ALT. 4 MIDDLE HAUL**	**ALT. 5 ALT. WEST**	**ALT. 6 CONV.**	**ALT. 7 CROW - WELLS**	**ALT. 8 MIDDLE ACCESS**	**NO ACTION**
NATIVE AMERICAN CONCERNS											
Acres of Temporary Access Loss	67	217	46	216	276	192	226	61	114	99	0
Acres of Permanent Access Loss	4	21	5	7	21	34	28	0	55	0	0
SOCIOECONOMICS											
Potential Effect on Crow Creek Property Values	Unlikely	Unlikely	Unlikely	Likely	Likely	Unlikely	Unlikely	Unlikely	Likely	Unlikely	None
TRANSPORTATION											
Change in Public Traffic Volume	None	None	None	None	None	None	None	None	Increase FR111 FR146 FR1102	None	None
Restrict Traffic on Forest Route	FR179	FR146	FR179	FR740	FR740	None	FR146	None	Increase on FR111 FR146	None	None
ENVIRONMENTAL JUSTICE											
	None	None	None	None	None	None	None	None	None	None	None

[1] Includes springs that would be physically disrupted, potentially reduced in flow, or affected in water quality
[2] AIZ = Aquatic Influence Zone
[3] RM = Roaded Modified, SPM = Semi-primitive Motorized, ROS = Recreation Opportunity Spectrum
[4] SCRA = Sage Creek Roadless Area
[5] MPRA = Meade Peak Roadless Area

2.10 Monitoring, Mitigation, and Agency Preferred Alternative

2.10.1 Required Monitoring and Mitigation

In addition to BMPs, mine and road design features, the Mine and Reclamation Plan, and Environmental Protection Measures (**Section 2.5**) proposed by Simplot, which are already included as part of the Proposed Action and any Action Alternative, the Agencies have determined that certain monitoring programs and mitigation measures are necessary. These programs and measures are in response to potential environmental impacts identified in **Chapter 4** of this EIS. These monitoring programs and mitigation measures described by resource below would apply to the Action Alternatives (except the No Action Alternative). If a resource is not listed, no specific monitoring program or mitigation measures have been proposed beyond what has already been included as part of the Proposed Action or Action Alternative. Details of the monitoring plan are included in **Appendix 2E**.

Due to the multiple alternatives under consideration in this Final EIS, preparing detailed monitoring plans for each resource, as necessary, has not been completed. Therefore, the Agencies have determined that a detailed monitoring plan would be prepared for the selected alternative as a condition of the Record of Decision. The monitoring plan would include all sampling and monitoring programs required for the applicable environmental resources and describe: objectives, compliance thresholds, monitoring locations and frequency, specific data to be collected, field and laboratory methods, quality control and quality assurance practices, reporting, and responses to apparent non-compliance conditions.

Reporting and Review
Simplot would provide monitoring reports to the Agencies on at least an annual (Calendar Year) basis or as determined by the Agencies. Reports would also be provided if requested, on time intervals consistent with other regulatory agency requirements to meet applicable laws and regulations (e.g. Clean Water Act, Clean Air Act, etc.). Simplot would participate as requested by the Agencies in any annual BMP review and evaluation that may be undertaken. These would be consistent with Table 5.4 of the RFP.

Air
Under Mining Alternative F, IDEQ would require Simplot to use low-nitrogen oxide generators or ‘ignition timing retard” practices to reduce the NOx emissions.

Mitigation to be applied to Transportation Alternative 7 for dust abatement includes providing bus service for Panel G mine employees once per shift.

For all mining and transportation alternatives, dust would be controlled on roads and mining areas with applications of water and/or magnesium chloride.

Air monitoring of the mining operations is not expected to be necessary. If the agencies believe nearby residents are being negatively impacted by dust from the mining operations, air monitoring would be conducted at these receptor locations to determine exposure levels.

Noise
For either Transportation Alternative 2 or 3 (East Haul/Access Road and Modified East/Haul Access Road), noise mitigation measures that Simplot would implement include: maintaining

equipment exhaust systems and engine sound controls to manufacturers' specifications, and preserving forest vegetation noise buffers to the extent possible.

For Transportation Alternative 7 (Crow Creek/Wells Canyon Access Road), noise mitigation would include utilizing a bus service once per shift for Panel G mine employees.

For all mining alternatives, Simplot would not conduct blasting operations during typical sleeping hours.

Water Resources

Where haul/access roads are currently designed close to or over springs, the finally selected road would be rerouted around them, or if that is not feasible, Simplot would install culverts, drains, or other mechanisms in the base of the road fills to ensure the natural spring flows would continue to flow.

Springs currently in use that are disrupted by mining or covered by road building would be replaced with alternate, permanent and generally equivalent water sources by Simplot, in accordance with the RFP requirements. This replacement would be done for springs that are affected either during (short-term) or after (long-term) mining operations. Disrupted springs that are within the footprint of the mine disturbance area would not be replaced in their original location; instead alternative water replacement sources would be located off the mine disturbance foot print. The specific type of water source replacement would be determined on a case-by-case basis in concert with the appropriate USFS resource specialists (hydrology, range, wildlife). Depending upon the location and the existing use of a water source, its replacement plans may need to consider wildlife other than just the large mammals (i.e., insects, amphibians, birds). The projects would be designed by Simplot, reviewed and approved by the USFS, constructed (and operated) by Simplot, and monitored for effectiveness by Simplot. Monitoring results would be submitted to the CTNF on a regular basis. In some cases, supplemental NEPA analysis and water rights changes may also be required. These spring mitigation measures would not necessarily restore the original functions and values of any wetlands at the native springs that are being replaced; these would be determined on a case-by-case basis.

Replacement options that would be considered include:

1. Supplying new water tanks with water hauled and/or piped by Simplot;

2. Improving water flow, or retention (ponding) at springs near the disturbed area to compensate for springs disrupted within the disturbed area, and/or fencing them (while considering the ramifications of fencing on specific species such as bats;

3. Building new livestock/wildlife watering ponds;

4. Building guzzlers, some of which could accommodate various species by using alternate guzzler designs such ramps, etc. (i.e., gallinaceous guzzlers);

5. Designing some mine runoff and sediment retention ponds to be available to livestock and wildlife, while monitoring water quality to ensure it is suitable for their consumption;

6. Drilling small water wells into Rex Chert or Dinwoody local aquifers with windmills to supply water tanks;

7. Creating wetland areas, flowing water areas, diverse shoreline areas, and enhancing vegetation to provide shade, cover, and habitat diversity; and

8. Enhancing nearby existing stock ponds that typically dry up early in the summer with bentonite sealing of the bottom, thereby extending their season of usefulness.

Further, if long-term monitoring of springs whose water quality can potentially be affected shows that unacceptable chemistry impacts are occurring, Simplot would be required to either clean up this water chemistry or safely dispose of the contaminated water and replace the lost water with clean water.

Additional groundwater monitoring sites would be added to the current groundwater monitoring program at the Smoky Canyon Mine (see **Appendix 2E**).

At Panel F, baseline well MC-MW-1 (**Figure 3.3-8**), and at minimum, three additional wells would be constructed to monitor ground water; two adjacent to Panel F and one in the south lease modification area. The wells would be located along the east side of Panel F and completed in the regional Wells formation aquifer. They would be sited down gradient of the panel and fills along the northeasterly and easterly flow paths between Panel F and South Fork Sage Creek. There may be one less monitoring well if the South Lease Modification is not approved.

At Panel G Simplot would continue to monitor well DC-MW-5 (**Figure 3.3-8**). At least one additional well would be required to monitor ground water. The well would be located on the east side of the panel and completed in the regional Wells formation aquifer. The well would be sited along the northeasterly flow paths between Panel G backfill and lower Deer Creek. Efforts would be made to locate all monitoring wells along probable ground water flow paths (faults or fracture zones). The placement of additional wells east of the initial monitoring wells could be triggered by observations of impacts in the regional aquifer.

All wells would be designed to monitor water levels and water quality in the regional aquifer down gradient of the backfill and external overburden fills, generally in the Wells formation. Installation would be according to Idaho Department of Water Resources standards. Hole depth is dependant on location and would be reviewed by the Agencies prior to installation.

Using the same methods as in the Panels F and G EIS baseline studies, the following constituents of concern would be analyzed: Selenium, Chromium, Cadmium, Manganese, Zinc, and Sulfate (see **Section 4.3.1** for identification of these COCs). In addition, the following field parameters would be required: water level, water temperature, pH, dissolved oxygen, and conductivity. Samples would be collected by Simplot or a qualified contractor and analyzed at an agency-approved laboratory. Samples would be collected quarterly for the first year and two times per year after that. Results would be conveyed to BLM, CTNF, and IDEQ following each sampling event. A summary would be provided to the Agencies annually, as a portion of the annual operations reports.

As the regional aquifer groundwater is expressed as surface springs in specific locations down gradient of the mine, groundwater would also be monitored through the surface water monitoring program at these locations.

Any groundwater wells used as a drinking water source, if any, would be also be sampled in accordance with IDEQ regulations for drinking water systems.

Additional surface water monitoring sites would be added to the current water monitoring program at the Smoky Canyon Mine (see **Appendix 2E**). The stations listed in **Table 2.10-1** would be included in the monitoring program.

TABLE 2.10-1 SURFACE WATER MONITORING STATIONS

CROW CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
SW-CC-1a	
SW-CC-350	
SW-CC-150	
SW-CC-75	
SAGE CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
LSV-2	
LSV-3	
LSV-4	
SOUTH FORK SAGE CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
SW-SFSC-800 (LSS)	
SW-UTSFSC-900	
SW-SFSC-500	
USS	
MANNING CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
SW-MC-800	
DEER CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
SW-DC-800	SP-UTDC-700
SW-DC-500	
SW-DC-400	
SOUTH FORK DEER CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
SW-SFDC-300	
NORTH FORK DEER CREEK	
SURFACE WATER STATION	**SPRING/SEEP**
SW-NFDC-900	SP-UTNFDC-540
SW-NFDC-200	
WELLS CANYON	
SURFACE WATER STATION	**SPRING/SEEP**
SW-WC-800	SP-UTWC-400
STEWART CANYON	
SURFACE WATER STATION	**SPRING/SEEP**
	SP-ST-100
	SP-ST-200

Using the same methods as in the Panels F and G EIS baseline studies, analysis would include the following parameters: flow, water temperature, pH, conductivity, dissolved oxygen, TDS, TSS, hardness, Sulfate, Cadmium, Chromium (III) and (VI), Selenium, Manganese, Nickel, and Zinc (see **Section 4.3.1** for identification of trace element COCs). Sample collection would take place two times per year (spring, fall). Sufficient notice prior to sample collection would be provided by Simplot such that agency oversight and split sample plans could be arranged. Sampling would be conducted by Simplot or a qualified third-party contractor. Results would be reported within 45 days of receipt of final analyses.

Baseline conditions of surface water stations currently vary in regard to concentration of analytes. Several Sage Creek stations measure impacts from the current Smoky Canyon Mine operations. Two monitoring stations (springs) in the Deer Creek drainage have naturally elevated concentrations of selenium and cadmium. Thus, surface water monitoring data would be evaluated in regard to change from baseline conditions with trend analysis. If data indicates that there are significant impacts from the mine operations, sampling frequency would be increased to determine the nature of the impact. As determined necessary, efforts would be taken to determine the source of the impact and preventative measures would be required.

Regular inspections would be conducted along the outer toes and slopes of all overburden fills to look for indications of seeps or springs discharging from the overburden.

Simplot would conduct infiltration testing within the footprint of the seleniferous overburden disposal sites prior to placing overburden. This testing would be conducted according to a plan that would be reviewed and approved by the Agencies before implementation. The testing would be intended to demonstrate that the vertical percolation rate in the seleniferous interior of the external overburden fills is sufficient to prevent development of seleniferous external overburden seeps.

Record keeping and use of a third-party quality control inspector satisfactory to the Agencies would be employed to ensure that the external overburden disposal facilities are built as proposed (**Appendix 2E**).

Roads would be designed, constructed, and operated to prevent a fuel or oil spill from entering nearby stream. Simplot would implement suitable BMPs to contain such an event.

Monitoring would take place for COPC content analysis of overburden proposed for use as construction material according to an agency-approved geochemical sampling program.

Monitoring of the construction and hydraulic performance of the Alternative D store and release cover would be conducted in accordance with an agency-approved construction quality control and operational monitoring plan. This plan would include monitoring of construction to provide data showing the store and release cover was built in accordance with agency-approved plans and specifications. It would also include monitoring of the operation of the store and release cover to provide data showing the cover is functioning as designed. Operational monitoring would include collection of representative data on the condition of the cover and moisture movement through the cover for comparison with conditions predicted in the design studies (**Appendix 2E**).

Monitoring the formation of erosional rills on the external overburden fills and backfilled pit surfaces and areas below them would be implemented. Corrective actions would be taken to insure that rills do not persist or enlarge into gullies on or below the overburden faces. This is important because formation of gullies would indicate an enlargement of the drainage network or increase in surface drainage density, which could result in enlargement and/or degradation of channel stability in downstream reaches of streams that could be sensitive to these effects.

Soils

Simplot would reduce the loss of soil fertility within the Project Area by incorporating slash into the salvaged growth medium to increase the organic matter content, mixing soil types containing few coarse fragments together with soils containing high coarse fragment content in order to dilute the total coarse fragment percentage, and timing salvage operations to optimize revegetation.

Prior to seeding, applied topsoil would be loosened, if it were compacted during application, to allow unrestricted root growth in the reclamation vegetation.

Monitoring the effectiveness of erosion and sedimentation control measures and other soil resource BMPs would be conducted according to an agency-approved soil resource monitoring plan.

In addition to monitoring effectiveness of proposed Environmental Protection Measures and BMPs, the soil resource monitoring plan would include:

- Monitoring of vegetation germination and growth for assessment of erosion potential based on percentage of ground cover and seedling establishment effectiveness (see monitoring requirement under Vegetation below).

- Soil sampling and analysis for initial nutrient amendment assessment for reclamation activities and to evaluate areas of low production after reclamation activities have concluded.

Vegetation

Vegetation monitoring to determine reclamation success on reclaimed sites would be conducted annually and reported to the Agencies by Simplot until reclamation is accepted and the reclamation bond is released (RFP standard under Prescription 8.2.2). The timing, level, and type of monitoring would be conducted in accordance with agency conditions for release and an agency-approved monitoring plan.

Simplot would use the most adapted and genetically appropriate plant material available for all seeding and planting activities. If feasible, collection of plant material (i.e., seed, transplants, roots) should be practiced to ensure an optimal match between plant material used and site conditions - increasing the likelihood of success.

Records would be kept of items such as seed or tree source, seeding methods, tree planting methods, species used, substrate, date of seeding or planting, etc. The boundaries of seeding or planting areas would be mapped in enough detail so they can be easily located again in the future. Accurate record keeping is necessary in order to determine if revegetation methods have been successful and cost effective, or if changes should be made.

The measurement of selenium and other COPCs in forage is required for any decisions on range management and the ultimate release of mined lands back to multiple use. Sampling would be conducted in accordance with the requirements of the Record of Decision, agency conditions for release, and an agency-approved plan.

Simplot would continue their program of monitoring and controlling noxious weed infestations. Only certified weed-free seed, mulch, straw bales, etc. would be used. Simplot would develop a plan for annual noxious weed treatment.

Wetlands

Jurisdictional channels and wetlands affected by temporary impacts that can be reclaimed would be restored to their approximate pre-construction conditions as mining or uses of affected areas are completed. Any waters and wetlands that would be permanently impacted would be mitigated on- or off-site or through compensatory mitigation, as required by the U.S. Army Corps of Engineers (USACE). The USACE may require compensatory mitigation even if the impacts are temporary due to temporal losses. Mitigation for temporal losses usually involves less than one to one replacement costs since the waters or wetlands would ultimately be restored. The type and amount of mitigation required would be determined by the USACE.

Wildlife

In order to reduce the possibility of incidental takes of migratory birds, Simplot would employ a variety of measures. The removal of timber would not take place in one project-wide event. Rather, timber would be harvested incrementally as areas to be mined need to be cleared. The first event would take place on the northern portion of Panel F, followed by possibly two more harvest events or phases. The timing of initial removal, although currently scheduled for late summer, may be dictated by the ROD release date and mine planning. Subsequent timber harvest would be planned in advance and scheduled to minimize impacts by consulting a table of possible bird species present and their applicable nesting seasons, compiled by FS, BLM, and FWS. Typically, minimizing impacts can be accomplished by delaying timber harvest activity as late in the nesting season as possible.

Prior to timber removal, Simplot would perform surveys for raptor nests, and other migratory birds to the maximum extent possible, (with emphasis on sensitive species: northern goshawk, flammulated owls, boreal owls, and great gray owls) before the onset of nesting seasons. If found, nests would be removed or the specific nesting tree would be felled to decrease the likelihood that raptors would return and nest in the harvest area.

The removal of brush in the ground clearing process would also be implemented in a manner to minimize impacts to migratory birds. Once timber has been removed and the area has been disturbed, it is likely that birds will prefer to nest outside the area to be cleared. Ground clearing would be completed incrementally, likely in three events. Initial ground clearing is currently scheduled for late-summer, but the ultimate schedule may be dictated by other factors. As with timber harvest activity, subsequent ground clearing would be planned in advance for as late in the nesting season as possible to avoid impacts. In addition, reclamation vegetation would include, where appropriate, woody species and brush to create islands of vegetative diversity which may attract some migratory bird species back to the area after reclamation.

Simplot would perform a survey to identify western toad populations in any potential toad habitat that would be disturbed, which had not yet been surveyed. This survey would be developed

cooperatively by CTNF wildlife or fisheries biologists and Simplot. If western toads were discovered during these surveys, potential mitigation measures would be developed. In addition, in the event the West (Proposed Action) or Modified West Haul/Access Road (Transportation Alternative 5) were selected, Simplot would survey the area south of the existing western toad breeding site in Sage Meadows to determine whether gradient and topography make migration of toads into this area, including montane habitat south of these roads, possible. Necessary mitigation would be developed by FS in cooperation with Simplot.

If Transportation Alternative 6 (the conveyor) were selected, Simplot may be required to install additional crossings to provide sufficient clearance for wildlife passage under the conveyor.

Fisheries

Simplot would implement a mitigation program as required to offset impacts to aquatic resources. This program would be established cooperatively by the CTNF, BLM, IDEQ, and Simplot, and would include stream crossing improvements, reclamation of roads that occur near streams, and the installation of fences along a reach of Crow Creek to protect fish habitat. Required work for mitigation would occur either before or during mining. The six mitigation measures are described below (and in more detail in **Appendix 4B**, YCT Biological Evaluation).

Mitigation measure #1 addresses movement of YCT between Project Area streams and larger waters in addition to sedimentation concerns (due to improperly sized culverts).

- Simplot would replace culverts identified in 2005 by the CTNF as under-capacity or blocking the upstream migration of fish, at the FR 102 and FR 111 crossings (**Appendix 4B**).

Mitigation measure #2 addresses the habitat quality of Smoky Canyon Creek with regard to sedimentation and riparian areas.

- Simplot would relocate an 8,000-foot section of Smoky Canyon Road over the reclaimed C-Panel and would narrow a separate 2,000-foot section of Smoky Canyon Road where the riparian area (floodplain) occurs. Simplot would restore this area.

Mitigation measure #3 addresses sedimentation concerns in South Fork Deer Creek.

- Simplot would reroute the segment of FS Road 146 (**Appendix 4B**) from approximately the Trappers Cabin to Panel G on the Panel G Haul/Access Road upon its reclamation. That segment of the rerouted road would be reclaimed to 20-foot wide surface. The portion of the FS Road that is no longer needed would be reclaimed by Simplot. Other mitigation measures can be accomplished with stewardship funding generated by the timber sale component of this Project.

Mitigation measure #4 addresses sedimentation concerns in Crow Creek downstream of Wells Canyon Creek.

- Simplot would replace the ford crossing of Wells Canyon Creek 0.1 miles upstream from the Forest boundary with a bridge or oversized culvert, if appropriate, that would accommodate truck and trailer traffic. The widened stream channel at the ford would be narrowed to the natural channel width during construction.

Mitigation measure #5 addresses sedimentation concerns in Crow Creek.

- Simplot would construct and maintain a four-strand barbed wire fence that would exclude livestock along a one-mile reach of Crow Creek. Simplot would repair a 22-acre

exclosure that occurs along this reach as well as construct and maintain a watering system consisting of five troughs fed by Crow Creek.

Mitigation measure #6 addresses sedimentation concerns in Deer Creek.

- Sedimentation will be reduced on FS Road 102 from Trappers Cabin to the Diamond Creek Divide to benefit streams in the project area. Segments of this road that are sources of sediment can be treated through resurfacing, drainage improvements, narrowing away from drainages, and/or obliteration/relocation away from streams. Funding for this project will be secured by and the work will be implemented by the Forest.

Monitoring for this Project follows the direction of NFMA, NEPA, and the RFP, and was designed by the Agencies and Simplot to address the uncertainties associated with selenium impacts on fish. Impacts attributed to Simplot activities would be addressed through changes in the Mine and Reclamation Plan or formation of suitable additional mitigation by the Agencies. The effectiveness of planned environmental protection measures would be assessed through this monitoring plan, which includes: 1) fish population surveys, 2) aquatic habitat surveys, and 3) selenium concentration inventories. These are described below (and in more detail in **Appendix 4B**):

1) Fish Population Surveys

Simplot would fund fish population monitoring in key units within the Crow Creek watershed, which would occur approximately every three years for the next 50 years. After 21 years, IDFG and CTNF Fisheries Biologists would determine if there is a need to change the frequency of monitoring or continue with the three-year schedule. After 30 years, IDFG and CTNF Fisheries Biologists would again review the population monitoring effort and determine if adjustments to the sampling schedule or strategy are necessary. If adjustments are not unanimously agreed upon, sampling would continue as is until year 50. If fish population data do not indicate long term negative trends after 50 years of monitoring, the Agencies would determine the need to continue the surveys for an additional 50 years. If there is a long term negative trend detected in the project site streams by year 50, the survey would continue for an additional 50 years as necessary. Any determination to change monitoring frequency must be approved by the Forest Supervisor and BLM District Manager.

Fish population monitoring would occur during low flows and in the following streams: **Crow Creek** (sampling sites CC-150, CC-350, CC-1A), **Spring Creek** (three sites to be determined by Simplot, with conditions similar to those at the Crow Creek sites), **Beaver Dam Creek** (three sites to be determined by Simplot, located in the lower, middle, and upper sections of the stream), **Sage Creek** (LSV-4, LSV-2C, LS), **South Fork Sage Creek** (LSS and one more site as far upstream as possible), **Deer Creek** (DC-100, DC-200, DC-600), **North Fork Deer Creek** (NFDC-700, NFDC-200), and **South Fork Deer Creek** (SFDC-100). A backpack electroshocker and at least two netters would be used to sample each 100 meter unit utilizing a three-pass method.

The fish population data would be entered into a database provided by IDFG and USFS and a monitoring report would be prepared summarizing the data and analyses. Data and reports would be shared with BLM, IDFG, WYGF, IDEQ, and the CTNF fisheries personnel, reviewed by the Agencies, and negative trends would be reported to the Forest Supervisor.

2) Aquatic Habitat Surveys

Simplot would fund aquatic habitat surveys that would be conducted three times: 1) prior to mining, 2) the year after Panel G is opened, and 3) the year after the reclamation release. Any additional physical survey requirements would be event-driven (such as after hydrological events that may affect monitoring parameters).

Physical surveys would occur during low flow periods and would include R1/R4 longitudinal surveys and channel cross-sections. Longitudinal surveys would occur in Deer Creek, South Fork Sage Creek, and Wells Canyon Creek. During the longitudinal surveys, all perennial stream length would be surveyed using a modified Hankin-Reeves survey methodology (R1/R4), as described in Overton et al. (1997). In addition, a Stream Reach Inventory and Channel Stability Evaluation would be conducted and documented for each survey reach. The R1/R4 data would be entered in the R1/R4 database and shared with the Agencies. Cross-section surveys would occur in **Crow Creek** (CC-150, CC-350, CC-1A), **Beaver Dam Creek** (same locations as fish population sites), **Sage Creek** (LSV-4), **South Fork Sage Creek** (LSS), **Deer Creek** (DC-200, DC-600), and **North Fork Deer Creek** (NFDC-700, NFDC-200). The cross-sections would include channel cross section diagrams, Wolman pebble counts, sediment grab samples (Duffield 1996), and a Riffle Stability Index as described by Kappesser (1992). Macroinvertebrate samples would be collected in accordance with IDEQ Beneficial Use Reconnaissance Program protocol for establishment of a macroinvertebrate biotic index to monitor beneficial use support. The IDEQ Stream Habitat Index would also be performed at each cross-section site. These parameters (listed in **Appendix 4B**) would be measured and/or ranked, then used to derive a SHI value that can be compared to other sites.

Aquatic habitat data would be entered into a database and a monitoring report would be prepared summarizing all physical survey data and analyses. The report would be shared with the CTNF fisheries personnel, BLM, IDFG, and IDEQ, reviewed by the Agencies, and negative trends would be reported to the Forest Supervisor.

3) Selenium Concentration Inventories

Simplot would fund the monitoring of trends in selenium concentrations within sediment, macroinvertebrates, periphyton, and fish every six years. In addition, as many annual baseline surveys would be conducted as possible between the project decision and project implementation. After 30 years, Fisheries Biologists from FS, BLM, IDFG, and IDEQ will review the selenium monitoring effort and recommend necessary adjustments to the sampling schedule or strategy to the Forest Supervisor and BLM District Manager. These assessments would continue for 50 years unless the Agencies decide to terminate them due to no detected impacts. After 50 years, the Agencies would decide each decade up to 100 years whether to continue the assessments, with the review and approval of both the Forest Supervisor and BLM District Manager.

Sampling would occur during low flow periods and would include sediment chemistry, benthic macroinvertebrate and periphyton tissue chemistry, and fish tissue. Selenium sample locations would occur in Crow Creek (CC-150, CC-350, CC-1A), Beaver Dam Creek (same locations as fish population sites), Sage Creek (LSV-4), South Fork Sage Creek (LSS), Deer Creek (DC-200, DC-600), and North Fork Deer Creek (NFDC-700, NFDC-200). All sampling would occur every 6 years except at Beaver Dam Creek, where sampling is only required once. Sampling and

analysis would be consistent with the interagency fish tissue selenium sampling protocol (currently being developed). In addition, every six years, a minimum of one redd (fish nest) would be sampled for juvenile trout near each Crow, Sage, South Fork Sage, Deer, and North Fork Deer creek sampling location (above), as well as near the Spring and Beaver Dam creek locations (listed in fish population monitoring section). The redd sampling would occur through redd excavation, and the percent of the juvenile trout in the redd that were deformed would be documented. Note that if trout redds are sampled for the site-specific criteria process, part of the CERCLA clean-up process, in the future, and the samples are at least as frequent as the samples required in this monitoring plan, the redd samples required in this monitoring plan would be discontinued in favor of those required by the site-specific criteria process.

Selenium concentration inventory data and reports would be provided to the Agencies for their review, and any concerns or negative trends would be reported to the Forest Supervisor and BLM District Manager. The Agencies reserve the right to require selenium sampling in fish eggs taken from spawning gravels if negative trends in other parameters are detected.

Grazing Management

Water Sources - In the case of springs that are currently used as water sources for grazing livestock, Simplot would establish mitigation protocols satisfactory to the CTNF on a case-by-case basis. These protocols may involve hauling or pumping water from outside sources until construction of new stock ponds or improvements of nearby springs can be made.

Trailing - Where haul roads cross existing Forest Trails used for driving livestock, trails up and over any road fills or cuts would be constructed by Simplot to allow safe passage for livestock at these locations across the haul road. In the case of the conveyor, sufficient ground clearance would be constructed where the conveyor crosses designated Forest Trails that would allow locations for livestock passage. If Transportation Alternative 6 (the conveyor) were selected, the Forest Service may require that additional crossings be provided with sufficient clearance for livestock passage under the conveyor.

Livestock would be prevented from grazing on reclaimed mine disturbances until these areas are accepted for grazing management by the CTNF.

Recreation and Land Use

Where Forest Trails are disrupted by mining operations, Simplot would post signs along the trails at the margins of the mining areas informing hikers about the mining activities and potential hazards within the mine area. If mine activities were such that travel through the mine area on the trail is not safe, the trail would be posted with signs indicating the trail is temporarily closed.

Trails would be re-established through mine areas as soon as practicable and would be well marked by Simplot to indicate the location of the designated trails through the mine disturbance. At locations where haul/access roads cross existing Forest Trails, trails for non-motorized access would be built across the haul/access roads by Simplot to allow convenient and safe, non-motorized crossing of the haul/access roads. Signs would be posted at these crossings warning visitors how to cross the haul/access roads safely and to avoid lingering or moving along the length of the haul/access roads. Signs would be posted on the haul/access roads at these crossings warning drivers on the haul/access roads to exercise caution.

Where established Forest Trails are crossed by the conveyor in Transportation Alternative 6, hiking, equestrian, and livestock access across the conveyor corridor would be maintained by Simplot with underpasses beneath the conveyor. If Transportation Alternative 6 (the conveyor) were selected, the Forest Service may require that additional crossings be provided with sufficient clearance for passage under the conveyor.

Forest Trail 404 connecting the Wells Canyon Road (FR 146) and the Deer Creek Trail 093 would be rebuilt by Simplot during initial mine development of Panel G a safe distance away from the disturbance limits of Panel G.

Cultural Resources

The known eligible sites near mining activities would continue to be avoided by current mining activities and would be monitored annually, by a professionally-trained archaeologist under the supervision of the CTNF Forest Archaeologist, for possible impacts.

Monitoring of CB-222 (Trapper's cabin), under the supervision of the CTNF Forest Archaeologist, is recommended in order to assess the potential for indirect effects of improving a public access road near the site (Panel G West Haul/Access Road).

The two unevaluated ("insufficient information to evaluate") cultural resource sites would require additional study/testing prior to implementation of the Proposed Project if the chosen alternatives would impact them. In order to evaluate the sites and mitigate impacts, the proposed mitigation measures would include:

- An overlay of historic and current grazing allotments with known arborglyphs sites and livestock trails,
- Interviews of current permittees of the seven allotments and possibly local ranchers about current and past corridors and trails (as well as campsites, water sources, etc.),
- Development of a thematic context statement. Research of names in arborglyphs and development of histories on local ranching families, ethnicities, settlement, etc.,
- Core sampling of select trees to support age/dating issues, and
- GPS coordinates for arborglyph group locations.

These mitigation measures would not only provide the needed data to evaluate the sites for the NRHP, but would also mitigate the adverse impacts if the sites were deemed eligible.

Transportation

Where the haul/access roads cut off existing Forest Routes (FR179 and FR740), turnaround areas would be built by Simplot at the temporary termination of the Forest Routes to allow safe and convenient turning of vehicles. At these locations, trails for non-motorized access would be built across the haul/access roads to allow convenient and safe, non-motorized crossing of the haul/access roads (see Recreation and Land Use).

To reduce environmental effects of mine employee traffic under Alternative 7 (Crow Creek/Wells Canyon Access Roads), Simplot would employ a bus service to make one round-trip per shift from one or more parking/pickup locations in Star Valley to Panel G.

To reduce the potential for oil spills getting into Crow Creek under Alternative 7, in the event of a fuel tanker accident on the road in this area, Simplot would require all fuel vendors to participate in a spill-response training program and make sure that all vendor trucks carry some spill response materials. Specific Simplot personnel at Panel G would be specially trained in responding to fuel spills along the Crow Creek Road. Spill response supplies and equipment (booms, absorbents, etc.) necessary to respond to a significant fuel spill along Crow Creek would be pre-positioned at Panel G or some location along Crow Creek for ready use.

2.10.2 Agency Preferred Alternative

A preferred alternative for this Project has been identified by the Agencies. Consideration given to public comments on the DEIS has resulted in changes to the Preferred Alternative that was contained in the DEIS. The requirement for inclusion of Alternative B, No External Seleniferous Overburden, was removed from the Agency Preferred Alternative. The reasons for this are discussed at the end of this section. The design for Alternative D has also been revised since the DEIS to include a store and release cover that would reduce impacts to water quality compared to the design evaluated in the DEIS.

The Agency Preferred Alternative consists of the following:

Transportation Alternatives

The USFS would approve the Preferred Transportation Alternatives and would permit the off-lease portions of the alignments, listed below, with Special Use Authorizations. BLM would also approve the Preferred Transportation Alternatives within the mineral leases as part of the Mine and Reclamation Plan.

<u>Proposed Action Panel F Haul/Access Road</u>
The Panel F Haul/Access Road described in the Proposed Action would provide access from the existing mine and mill to the Panel F lease. The road would cross a portion of the Sage Creek Roadless Area (SCRA) in providing access to the existing Panel F lease. Construction of this road would provide the only available access to the existing mineral lease at an appropriate elevation to fully develop the mineral resources of the lease. The alternative road alignment (Transportation Alternative 1) would avoid off-lease disturbance in the SCRA, but would not allow for full recovery of ore. It would preclude recovery of approximately 6 percent of the mineral resource in the lease. The USFS has determined that construction of this road is exempt from the road-building prohibitions of the Roadless Area Conservation Rule because it provides access needed in conjunction with a phosphate lease issued prior to the effective date of the rule and construction will be conducted in a manner that minimizes effects on surface resources and prevents unnecessary or unreasonable surface disturbance [36 CFR 294.12(b)(7)] (USFS 2007).

<u>Proposed Action Panel G West Haul/Access Road</u>
The Agency Preferred Transportation Alternative to access Panel G is the Proposed Action, Panel G West Haul/Access Road. This is changed from the DEIS where the Agencies identified

Alternative 2, the East Haul/Access Road, as the Preferred Alternative. Alternative 2 would cross a portion of private land. Currently, Simplot has not been able to obtain an easement across the private land. Thus, construction of the East Haul/Access Road would not be possible at this time.

This West Haul Road would have a greater short-term impact on the Deer Creek watershed than Alternative 2. However, the West Haul/Access Road would have no direct effect on private property and no anticipated noise or visual impacts on the property owners in the Crow Creek Valley. Compared to the East Haul/Access road, it would have the second fewest acres of disturbance in IRAs of any transportation alternative. It would disturb the least amount of intermittent channels, have the fewest culverts in intermittent channels, a lower slope stability hazard compared to the east alignments, disturb the fewest acres of sage brush habitat, and disturb the second fewest acres of Aspen habitat.

The USFS has determined that construction of the West Haul/Access Road is exempt from the road-building prohibitions of the Roadless Area Conservation Rule because it provides access to the authorized lease issued prior to the effective date of the rule and construction will be conducted in a manner that minimizes effects on surface resources and prevents unnecessary or unreasonable surface disturbance [36 CFR 294.12(b)(7)] (USFS 2007).

The USFS has determined that the Panel G West Haul/Access Road would be reclaimed differently than described in the Proposed Action in order to maximize long term benefits to fisheries. Under the 2001 Roadless Area Conservation Rule, the segments of the West Haul Road located in the Sage Creek or Meade Peak inventoried roadless areas would be obliterated when no longer needed for purposes of the lease. In that case, there would be more reclamation and fewer impacts than described in this FEIS. If changes to management of inventoried roadless areas occurs as a result of current or future legal action or rule making, upon completion of the project, a 1-mile portion of the West Haul/Access Road would be left as replacement alignments for portions of the Wells Canyon Road (FR 146).

In the Proposed Action, the USFS requested that a 2.9 mile stretch of the Panel G West Haul/Access Road be reclaimed down to a 20-foot width and be left open for public use as a replacement of portions of the Wells Canyon Road (FR 146) and Diamond Creek Road (FR 1102) currently located in riparian areas. Relocation of the Forest Roads out of the riparian areas would benefit fisheries by decreasing the long term addition of sediment from the roads to the watershed. However, this would require large fills and long culverts to remain in the Deer Creek and South Fork Deer Creek drainages which would impact fisheries in the long term.

Rather than relocate the entire 2.9 miles as described in the Proposed Action, relocation of just the portion from the South Fork Deer Creek crossing to Panel G would occur. This portion of the existing FR 146 would be improved by virtue of its relocation out of the Wells Canyon riparian area. In addition, both large fills at the Deer Creek and South Fork Deer Creek crossings would be completely removed, rather than being partially reclaimed. This change from the Proposed Action would reduce long term sediment load by virtue of relocating the Forest Road out of riparian areas, and by fully reclaiming the crossings of Deer Creek and South Fork Deer Creek. This would result in less acres of haul road being partially reclaimed and environmental impacts of the Panel G West Haul/Access Road would be less than what is described in this FEIS.

While the Panel G West Haul/Access Road is in use, fish passage will be provided at the two perennial stream crossings with appropriately sized culverts (sized to account for bankfull width and 100 year flood events) that are either pre-fit with weirs to form pools or with low relief baffles to retain appropriately sized stream substrate that is installed in the pipe during culvert placement. Culverts pre-fit with weirs do not account for the upstream passage needs of less mobile biota such as amphibians and macroinvertebrates, while the simulated stream bottom provided by stream substrate retained by low-relief baffles provide upstream passage for all aquatic life forms.

The environmentally preferable transportation alternative would be Alternative 2, the East Haul/Access Road. As stated above, construction of this road is not possible at this time. Access to Panel G is not required for several years. During that time, if Simplot and the private land holder were to come to a mutual agreement that would provide Simplot an easement, the East Haul/Access Road would replace the Panel G West Haul/Access Road. Alternative 2 would have the greatest impact on private property and esthetics to land owners in Crow Creek, but it would have the fewest environmental impacts of all of the alternatives to several important resources.

Alternative 2 would result in less unreclaimed disturbance than all the other Panel G haul/access road alternatives. It has only one culvert crossing of a perennial stream (Deer Creek) and would be located the furthest east (downstream) of all the transportation alternatives, leaving the greatest portion of the Deer Creek watershed unaffected by the road. When compared to the other Panel G haul/access roads, it has the least potential to release contaminants by disturbing Meade Peak Shale along the road prism and generates the lowest annual sediment yield. It disturbs the fewest acres of Aquatic Influence Zones (AIZs) of all transportation alternatives and disturbs the least linear footage of streams considered Waters of the U.S. It shares status with the conveyor – Middle Access Road combination of having the second lowest disturbance area of wetlands of all the transportation alternatives. It has the least amount of disturbed area in the Sage Creek IRA of the haul/access roads under consideration and disturbs the fewest acres of USFS grazing allotments. In contrast to the benefits, the alignment lies closest to the Crow Creek area and would thus have the highest level of noise, greatest visual effect, access interference, and largest socioeconomic impact on local residents as described in more detail in **Table 2.9-2** and **Chapter 4**.

Mining Alternatives

BLM would approve the Preferred Mining Alternatives, listed below, in the Mine and Reclamation Plan.

<u>Proposed Action Mining both Panels F and G</u>
The Agency Preferred Alternative includes mine plan approval of both Panel F and Panel G and both the North and South Lease Modifications to the Panel F lease (IDI-27512) as described in **Section 2.4** along with the other components discussed below. The Proposed Action Panel F Haul/Access Road would encounter phosphate ore within the road excavation north of the existing Panel F lease. To enable recovery of the ore within the road excavation the BLM would issue the North Lease Modification.

Considering the environmental impact analysis contained in this document, the Agencies believe that the mine plan described in the Preferred Alternative for mining the South Lease

Modification area is adequately protective of the environment since the environmental impacts are predicted to be in compliance with established requirements such as the Clean Water Act, Surface Mining Act, Ground Water Protection Rule, Idaho Surface Water Protection Act, other applicable regulations, and the Revised Caribou Forest Plan, with the incorporation of Mining Alternative D and the other monitoring and mitigation measures proposed in this FEIS. Therefore the BLM and USFS have included issuing the South Lease Modification and approval of the mining of this lease modification within the Agency Preferred Alternative.

The Forest Service Roadless Area Conservation Rule (RCRA) (36 CFR Part 294) currently applies to Forest Service actions in Inventoried Roadless Areas (IRA). The RACR prohibits a Forest Service responsible official from approving road construction and reconstruction and the cutting, sale, or removal of timber in IRAs except when the responsible official determines certain circumstances apply. Among the circumstances when the rule does not apply are when one of the following circumstances exists:

(1) A road is needed to protect public health and safety in cases of an imminent threat of flood, fire, or other catastrophic event that, without intervention, would cause the loss of life or property;

(2) A road is needed to conduct a response action under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) or to conduct a natural resource restoration action under CERCLA, Section 311 of the Clean Water Act, or the Oil Pollution Act;

(3) A road is needed pursuant to reserved or outstanding rights, or as provided for by statute or treaty;

(4) Road realignment is needed to prevent irreparable resource damage that arises from the design, location, use or deterioration of a classified road and that cannot be mitigated by road maintenance. Road realignment may occur under this paragraph only if the road is deemed essential for public or private access, natural resource management, or public health and safety;

(5) Road reconstruction is needed to implement a road safety improvement project on a classified road determined to be hazardous on the basis of accident experience or accident potential on that road;

(6) The Secretary of Agriculture determines that a Federal Aid Highway project, authorized pursuant to Title 23 of the United States Code, is in the public interest or is consistent with the purposes for which the land was reserved or acquired and no other reasonable and prudent alternative exists; or

(7) A road is needed in conjunction with the continuation, extension, or renewal of a mineral lease on lands that are under lease by the Secretary of the Interior as of January 12, 2001 or for a new lease issued immediately upon expiration of an existing lease. Such road construction or reconstruction must be conducted in a manner that minimizes effects on surface resources, prevents unnecessary or unreasonable surface disturbance, and complies with all applicable lease requirements, land and resource management plan direction, regulations, and laws. Roads constructed or reconstructed pursuant to this paragraph must be obliterated when no longer needed for the purposes of the lease or upon termination or expiration of the lease, whichever is sooner.

BLM's approval of a lease modification is not prohibited by the RACR.

Because the mine plan described in the Agency Preferred Alternative provides that mining will not occur in the South Lease Modification area until at least 3 years from the date of approval of the mine plan, no determination is currently necessary regarding which regulations apply to mining activities within the South Lease Modification area. To maintain the status quo on the ground until this determination is made, the mine plan approval and issuance of the lease modification would be conditioned such that no mining activities, road construction and/or surface disturbing activities would be allowed in the South Lease Modification area until a subsequent determination is made.

Mining Alternative D – Incorporation of an infiltration reducing Store and Release Cover over Seleniferous Overburden Fills

In order to comply with Clean Water Act standards and the Idaho Groundwater Water Rule, the mine plan, as described in the Proposed Action, would be mitigated. Compliance with State water quality standards would be achieved through the use of a store and release cover over the seleniferous overburden. All areas of seleniferous overburden fills would be covered to reduce infiltration into the overburden. The cover would consist of 1 – 2 feet of topsoil underlain by 3 feet of Dinwoody clay-rich shale material meeting specific design characteristics, which would be underlain by 2 feet of chert. The material properties of this cover would: 1) permanently isolate the seleniferous overburden from direct exposure to the surface environment; 2) minimize uptake of selenium in vegetation growing on the cover; and 3) reduce net percolation of annual precipitation through the overburden into the groundwater to established amounts. The cover would be required to perform at a net percolation rate established during the design studies from infiltration models of the cover and overburden fills. Infiltration reduction by the cover would reduce overburden leachate rates to low enough values to assure compliance with applicable water quality standards. Regional groundwater quality at the downgradient lease boundaries would comply with all State groundwater quality standards and regional groundwater emerging to surface water in South Fork Sage Creek Spring, Books Spring, lower Deer Creek, and Crow Creek would comply with all surface water quality standards.

Mining Alternative E – Power Line along Haul/Access Roads

Placing the electric power line along the selected haul/access roads would reduce surface disturbance by eliminating the need for a separate right-of-way disturbance to provide electric power to the mine panels.

A summary of environmental impacts caused by the combination of the above described components is shown in **Table 2.10-2**.

TABLE 2.10-2 AGENCY PREFERRED ALTERNATIVE IMPACTS

	MINING	TRANSPORTATION	TOTAL
Disturbed Acres	1,165	284	1,449
Acres not Reclaimed	46	25	71
Total Tons Air Emissions	8,613	2,711	11,324
DBA Noise at Crow Creek	50 - 52	None	50 – 52
% Crow Ck. HUC 5 Disturbed	1.3	0.3	1.6
Springs Impacted	20	2	22
TPY Sediment	Negligible	9.0	9.0
Culverts in Perennial Streams	0	2	2
Culverts in Intermittent Channels	0	6	6
Comply w/ SW or GW Standards	YES	YES	YES
Acres Forest Disturbed	1,072	262	1,334
Feet Waters of the US Disturbed	12,470	770	13,240
Acres of Wetlands Disturbed	1.39	1.43	2.82
Feet Intermittent Channel Disturbed	19,520	680	20,200
Feet Perennial Stream Disturbed	0	475	475
Acres AIZs Disturbed	51.1	15.6	66.7
Acres Wolf & Lynx Habitat Disturb	1,165	284	1,449
Acres Raptors, Owls Disturbed	1,072	262	1,334
Acres Sage Habitat Disturbed	73	9	82
Acres Riparian Habitat Disturbed	1.3	1.5	2.8
Acres Western Toad Migr. Area Dist.	388	120	508
Acres Grazing Allotments Disturbed	1,165	284	1,449
Number Forest Trails/Roads Disturbed	3/0	6/2	8*/2
Acres On/Off Lease in SCRA	830 /194	7 / 83	837 / 277
Acres On/Off Lease in MPRA	31 / 0	2 / 32	33 / 32
Number Cultural Sites Impacted	1	2	2*
Heritage Impacts	Minor – Mod.	Negligible	Negl. – Mod.

*Note both mining and roads disturb a common trail and a common cultural site.

Eliminating Alternative B from the Agency Preferred Alternative

The Agency Preferred Alternative in the DEIS included Alternative B, which would have eliminated all seleniferous overburden fills external to the pit boundaries. The Agencies included this in their Preferred Alternative of the DEIS to provide additional assurance that external overburden seeps of seleniferous water would not occur, and to reduce the area requiring the Store and Release Cover.

The environmental protection rationale behind the Agencies' previous proposal to include Alternative B in the Preferred Alternative, reduction of potential for overburden seeps, has been addressed by the revised cover design for Alternative D. The Alternative D evaluation in the DEIS was based on back-calculated performance targets established through groundwater modeling. The cover itself had not yet been designed nor had its effectiveness in reducing infiltration into the overburden been demonstrated at the time the DEIS was written. Thus, the Agencies felt it was warranted to conservatively include Alternative B into their Agency Preferred Alternative in the DEIS.

As described in **Section 2.6.1**, Alternative D of this FEIS, the overburden cover design has since been refined to consist of a store and release cover that has been designed through extensive unsaturated flow modeling. The effectiveness of this cover design at reducing infiltration of water through the cover to acceptable levels has been demonstrated to the Agencies' satisfaction. This cover would reduce infiltration of water into the seleniferous pit backfills and the external overburden fills to the degree where percolation of water from the base of these fills into the subsurface would eliminate the potential for external overburden seeps of seleniferous water. Experience at the Smoky Canyon Mine and two infiltration studies have shown that the underlying Wells Formation has substantial infiltration capacity and removing soil from the top of the formation outcrop ensures adequate percolation rates into the formation to handle infiltration into the overburden fills surfaces even without a store and release cover. This practice of removing low permeability materials (topsoil) from the foundation areas of the Panels F and G overburden fills is part of the BMPs that would be applied to the project. Thus the Alternative D cover proposed for Panels F and G eliminates the need to rehandle the seleniferous external overburden fills and move them into the pit backfills.

In comments on the DEIS, Simplot clarified that the economic impacts of adding the increased costs of both Alternative B and D together would not be feasible. Although the revised cover design sufficiently addresses potential for seleniferous seepage, the BLM has made additional inquiries of Simplot to describe the specific economic impacts of Alternatives B and D together. Data provided by Simplot, and verified by the BLM, indicates both alternatives together would result in the loss of about 18.4 MMT of ore, which would make the mining project not feasible. Thus the combination of these two mining alternatives appears to be environmentally unnecessary and economically unfeasible and therefore Alt. B is no longer part of the Agency Preferred Alternative.

Reclamation Cost Estimate

Under its regulatory authority, prior to allowing Simplot to start operations at Panels F and G, the BLM would require Simplot to post an actual-cost bond to ensure that adequate funds would be available to the federal government to close and reclaim the Panels F and G mine expansion at any point during the life of that operation. This bond amount would be in addition to that already posted for the existing and currently permitted operations at Smoky Canyon Mine. The amount of money required to reclaim Panels F and G would vary during the life of the operations because the disturbance would be created in incremental phases and would also be reclaimed concurrently with mining. The status of planned and actual mining and reclamation is formally reviewed by Simplot and the Agencies on an annual basis. These reviews provide the information to the Agencies to revise the required reclamation bonding as necessary. Thus, it is not necessary for the federal government to require a bond for the entire life-of-mine, reclamation scope of work; rather, it should always have enough bond to cover the maximum reclamation liability at any point in time during the mine life.

While not a requirement of the NEPA process, an actual-cost bond calculation is typically a requirement spelled out in the ROD. In this case, an actual-cost reclamation estimate has been prepared for Panels F and G, using the Agency Preferred Alternative (**Table 2.10-3**), in order to give the public an idea of what the bond would include and an approximate value. This estimate would be refined as a condition of the Record of Decision when all conditions of approval are known. This cost estimate is based on the current mine plans and mining schedule, which are subject to change based on changes in conditions such as economic environment and ore

quality. The largest costs relate to earthwork including recontouring and construction of the final cover. Labor rates for the reclamation crew were based on Davis-Bacon rates as of July 2006. Equipment efficiencies and rates were based on the 2006 Cost Reference Guide. Agency administrative costs were based on standard BLM guidance for reclamation bond estimating.

Table 2.10-3 shows the estimated total reclamation cost for the entire mine life of Panels F and G in constant 2006 dollars. The total figure calculated represents a scenario in which the entire project is mined, no reclamation is completed, and the Agencies are forced to complete 100% of the reclamation using contracted work crews. The estimated maximum reclamation liability at any point in time would be significantly less. Thus, the actual-cost bond held at any given time would likely be less than the total cost estimate shown below. Periodic review of the bond would occur to ensure that the financial assurance held would cover the maximum reclamation liability at any point in time during the mine life.

TABLE 2.10-3 RECLAMATION COST ESTIMATE (2006 $)

COST COMPONENT	PANEL F	PANEL G	TOTAL
Recontouring	560,000	1,628,000	2,189,000
Construct Cover	4,411,000	10,460,000	14,871,000
Seeding and Planting	503,000	874,000	1,377,000
Facilities Demolition	4,000	213,000	217,000
Agency Administration	1,674,000	4,026,000	5,700,000
Total	7,148,000	16,989,000	24,354,000