

Environmental Consequences

from implementation of this alternative would not exceed the Bureau of Land Management Visual Resource Management Class III or Class IV objectives of the INEEL, or the Class I or Class II objectives of adjacent lands. In addition, two new facilities could be built within the 200-East Area of the Hanford Site. The dimensions of the new facilities, including stacks, would not exceed the dimensions of the existing 200-East Area facilities.

Direct Vitrification Alternative – *The Vitrification with Calcine Separations Option would have a number of new facilities similar to the Separations Alternative (see Table 5.2-1). The dimensions of the new facilities would be of the same relative size and scale as the existing facilities. New emission stacks, if any, are not expected to exceed the height of the existing INTEC main stack.*

Under this alternative, stack emissions would result from operations associated with the vitrification facility. These emissions would be limited to the requirements set by their respective permits. Section 5.2.6, Air Resources, discusses emission levels and air impacts in greater detail. New facilities and emissions resulting from implementation of this alternative would not exceed the Bureau of Land Management Visual Resource Management Class III or Class IV objectives of the INEEL or the Class I or Class II visual resource objectives of adjacent lands.

5.2.5 GEOLOGY AND SOILS

This section presents potential impacts to geological resources from implementing the proposed waste processing alternatives described in Chapter 3. Potential impacts were assessed by reviewing project plans for the *twelve* proposed options to determine impacts to geologic resources and soils. Potential impacts to the Snake River Plain Aquifer, a unique hydrogeological resource, are discussed in Section 5.2.7. Because the Minimum INEEL Processing **Alternative** involves shipment of mixed HLW to the Hanford Site for treatment, possible impacts to geological resources at Hanford were also

evaluated (see Appendix C.8). Unless otherwise noted, the discussion of impacts presented in this section specifically applies to INEEL.

Most of the waste processing activities would take place inside the perimeter fence at INTEC, an area that has been dedicated to industrial use for more than 40 years. Table 5.2-1 of Section 5.2.1 lists new facilities that would be built inside and outside of the INTEC perimeter fence and acreage of new areas that would be disturbed. No mineral deposits or unique geologic resources have been found in the INTEC area (see Section 4.6.2); therefore, no impacts are expected to these resources under any of the alternatives. Most of the impacts to soils are expected to be associated with construction activities (e.g., excavating, earthmoving, and grading). Waste management facilities would be designed with safeguards to minimize operational impacts (e.g., spills of toxic substances) to soils. Consequently, no operational impacts are discussed.

Potential seismic activity was discussed in Section 4.6.3. Potential impacts to HLW facilities from seismic events and volcanism are evaluated in Section 5.2.14, Facility Accidents, and thus are not discussed further in this section.

5.2.5.1 No Action

Under this alternative, DOE would build a Calcine Retrieval and Transport System to move calcine from bin set 1 to bin set 6 or 7. No other new facilities would be required; therefore, there would be minimal impact to soils and no impact to geologic resources.

5.2.5.2 Continued Current Operations Alternative

Under this alternative, current HLW processing activities would continue, and several INTEC facilities, including the New Waste Calcining Facility, would be upgraded or expanded. DOE would build a Newly Generated Liquid Waste Treatment Facility and a Calcine Retrieval and Transport System to move calcine from bin set 1

to bin set 6 or 7. No other new facilities would be required; therefore, there would be minimal impact to soils and no impact to geologic resources.

5.2.5.3 Separations Alternative

Full Separations Option – Under this option, a number of new waste management and support facilities would be built within the developed portion of INTEC. If low-level waste Class A type grout is disposed of in an onsite land disposal facility, a Low-Activity Waste Disposal Facility would be built *as described in Section 5.2.1.3*. Soil would be excavated for new structures extending beneath the ground surface including the Low-Activity Waste Disposal Facility. Because the INTEC area is relatively flat and rainfall in the region is light (annual precipitation averages less than 9 inches), the potential for erosion is small. DOE would employ standard soil conservation measures (e.g., reseeding disturbed areas) in construction areas to limit soil loss and further reduce impacts. This area does not contain any unique geologic resources.

Planning Basis Option – This option is similar to the Full Separations Option, but differs in the way that mixed transuranic waste/SBW is managed and in the way that the low-level waste fraction is disposed of (see Chapter 3). The same new waste processing facilities would be required under this option, but low-level waste Class A type grout would be disposed of offsite at a commercial radioactive waste disposal facility. As noted in the previous section, the potential for erosion is small in the INTEC area because it lies in a flat floodplain in a region that receives limited rainfall.

Transuranic Separations Option – New facilities for this option would include the Transuranic Separations Facility, Class C Grout Plant, New Analytical Laboratory, and the Waste Treatment Pilot Plant. As previously described, a Low-Activity Waste Disposal Facility would be required if the low-level waste fraction is disposed of onsite. This option would have the same potential impacts on geologic resources

and soils as described for the Full Separations Option.

5.2.5.4 Non-Separations Alternative

None of the *four* options comprising this alternative would require new construction outside of INTEC. Table 5.2-1 of Section 5.2.1 lists new facilities that would be built inside the developed portion of the INTEC under each of the *four* Non-Separations Alternative options. There would be some soil excavation for these new facilities, but as noted in **Section 5.2.5.3**, the potential for erosion is small in the area of the INTEC. No impacts to geologic resources are expected.

5.2.5.5 Minimum INEEL Processing Alternative

Under this alternative, several new facilities would be built *at* INTEC to package calcine for shipment to the Hanford Site. If DOE disposes of the vitrified low-level waste fraction (returned from the Hanford Site) in an onsite land disposal facility, a Low-Activity Waste Disposal Facility would be built *as described in Section 5.2.1.3*. At the Hanford Site, new Canister Storage Buildings (under the Interim Storage Scenario) and a Calcine Dissolution Facility would be built in the 200-East Area. Soil would be excavated for foundations of buildings at both INTEC and Hanford, but impacts to soils would be small and impacts to geologic resources would not be expected at either site.

5.2.5.6 Direct Vitrification Alternative

Under this alternative, a number of new waste management and support facilities would be built within the developed portion of INTEC (see Table 5.2-1). There would be some soil excavation for these new facilities, but the potential for erosion is small in the area of INTEC. No impacts to geologic resources during construction or operation are expected under the Direct Vitrification Alternative.