5.0 Environmental Consequences

The results of analyses performed to assess potential environmental consequences, or impacts, of implementing any of the alternatives are presented in the following sections. For each category of potential environmental impacts considered, brief descriptions of the impact analysis method and the analysis results are given. Details of analytical methods, where applicable, are provided in appendixes, as noted within each section. Because the type and level of analysis typically needed for each environmental aspect of interest vary widely, the level of detail in the results presented in the following sections varies commensurate with the nature of the analysis and the potential for consequences associated with that environmental aspect.

In Section 3, Description and Comparison of Alternatives, various alternatives were described for storage, treatment, and disposal of low-level waste (LLW), mixed low-level waste (MLLW), transuranic (TRU) waste, and immobilized low-activity waste (ILAW, the low-activity fraction of tank waste). For purposes of analysis in this section, consequences associated with the alternative actions for each waste type have been combined to provide a consolidated analysis of waste management operations. In the following sections, these consolidated analyses, while retaining the designations corresponding to the various alternatives for each waste type described in Section 3, are analyzed by groups of alternatives. This approach facilitates presentation of impacts for all Hanford Solid Waste Program operations and also is necessary to evaluate facilities that are used to manage more than one type of waste. In these latter consolidated alternative groups, each of the waste types is considered, and the impacts either are analyzed directly or bounded by analysis of similar activities where appropriate.

Unless stated otherwise, waste volumes for which evaluations of environmental consequences of the alternatives were made include a Hanford Only volume, a Lower Bound waste volume consisting of the Lower Bound volumes for LLW and MLLW (some of which would be received from offsite generators),[(a)] the maximum forecast volume for TRU waste, and the ILAW volume as defined in Section 3. Similarly, evaluations were made for an Upper Bound waste volume consisting of the Upper Bound volumes for LLW and MLLW as might be received from offsite (in keeping with provisions of the Waste Management Programmatic Environmental Impact Statement [WM PEIS] [DOE 1997]), the maximum forecast volume for TRU waste, with additional offsite waste, and the Hanford Site ILAW volume, again as defined in Section 3.

The alternatives analyzed in detail by groups are described in the following paragraphs. The cumulative impacts are discussed in Section 5.14.

(a) The amount of the Lower Bound waste volume received from offsite generators would consist of 18 percent Category 1 LLW, 4 percent Category 3 LLW, and 0.2 percent MLLW.

Alternative Group A

Actions included in Alternative Group A are:

- modification of the T Plant Complex to treat some MLLW and for processing and certification of some TRU waste for shipment to the Waste Isolation Pilot Plant (WIPP)
- treatment of other MLLW
- treatment of some non-conforming LLW at commercial facilities, followed by return to the Hanford Site for disposal
- continued operation of the Waste Receiving and Processing Facility (WRAP) to process and certify some TRU waste for shipment to WIPP
- shipment of all TRU waste to WIPP following processing and certification
- disposal of LLW in 200 West Area low-level burial grounds (LLBGs) in unlined trenches that would be deeper and wider than those currently employed
- disposal of MLLW in 200 East Area LLBGs in lined trenches that would be deeper and wider than those currently employed
- disposal of melters in a lined trench in a new disposal facility near the Plutonium-Uranium Extraction (PUREX) Plant in the 200 East Area
- disposal of ILAW in multiple lined trenches in a new disposal facility near the PUREX Plant
- capping LLW trenches in the LLBGs with a modified Resource Conservation and Recovery Act (RCRA) Subtitle C cover
- capping MLLW trenches with a modified RCRA Subtitle C cover
- capping the melter trench with a modified RCRA Subtitle C cover
- capping the ILAW disposal facility with a modified RCRA Subtitle C cover.

Alternative Group B

Actions included in Alternative Group B are listed here. Actions that are the same as those in Alternative Group A are presented in *italics*.

- construction of a new waste processing facility in the 200 Areas to provide onsite capability to treat most MLLW and non-conforming LLW, and for processing and certification of TRU waste for shipment to WIPP (rather than modifying T Plant for that purpose)

- treatment of non-conforming LLW onsite

- treatment of a limited quantity of MLLW at commercial facilities, followed by return to the Hanford Site for disposal

- *continued operation of the WRAP to process and certify some TRU waste for shipment to WIPP*

- *shipment of all TRU waste to WIPP following processing and certification*

- disposal of LLW in 200 West Area LLBGs in unlined trenches of a design similar to those currently employed

- disposal of MLLW in 200 West Area LLBGs in lined trenches of a design similar to those currently employed until permitted lined trenches are full, then disposed of in 200 East Area LLBGs, again in trenches similar to those currently employed

- disposal of melters in the 200 East Area in a lined melter trench

- disposal of ILAW in multiple lined trenches in the 200 West Area

- capping LLW and MLLW trenches in the LLBGs with a modified RCRA Subtitle C cover

- capping the melter trench with a modified RCRA Subtitle C cover

- capping ILAW burial site with a modified RCRA Subtitle C cover.

Alternative Group C

Actions included in Alternative Group C are listed below. Actions that are the same as those in Alternative Group A are presented in *italics*.

- *modification of the T Plant Complex to provide the capability for treating some MLLW and for processing and certification of some TRU waste for shipment to WIPP*

- *treatment of other MLLW and some non-conforming LLW at commercial facilities, followed by return to the Hanford Site for disposal*

- *continued operation of the WRAP to process and certify some TRU waste for shipment to WIPP*

- *shipment of all TRU waste to WIPP following processing and certification*

- disposal of LLW in 200 West Area LLBGs in a single unlined expandable trench

- disposal of MLLW in 200 East Area LLBGs in a single lined expandable trench

- disposal of melters in a lined trench near the PUREX Plant in the 200 East Area

- disposal of ILAW in a single lined expandable trench near the PUREX Plant

- *capping LLW trenches in the LLBGs with a modified RCRA Subtitle C cover*

- *capping MLLW trenches with a modified RCRA Subtitle C cover*

- capping the melter trench with a modified RCRA Subtitle C cover

- *capping the ILAW burial site with a modified RCRA Subtitle C cover.*

Alternative Group D

Alternative Group D contains three subalternative groupings that depend on the location of disposal. These are denoted by subscripts.

Actions included in Alternative Group D are listed here. Actions that are the same as those in Alternative Group A are presented in *italics*.

- *modification of the T Plant Complex to provide the capability for treating some MLLW and for processing and certification of some TRU waste for shipment to WIPP*

- *treatment of other MLLW and some non-conforming LLW at commercial facilities, followed by return to the Hanford Site for disposal*

- *continued operation of the WRAP to process and certify some TRU waste for shipment to WIPP*

- *shipment of all TRU waste to WIPP following processing and certification*

- Alternative Group D_1—disposal of LLW, MLLW, melters, and ILAW in a lined modular facility in the 200 East Area near the PUREX Plant

- Alternative Group D_2—disposal of the wastes listed above in a lined modular facility in the 200 East Area LLBGs

- Alternative Group D_3—disposal of the wastes listed above in a lined modular facility at the Environmental Restoration Disposal Facility (ERDF)

- capping the lined modular facility with a modified RCRA Subtitle C cover.

Alternative Group E

Alternative Group E contains three subalternative groupings that depend on the location of disposal and waste type. These are denoted by subscripts.

Actions included in Alternative Group E are as listed below. Actions that are the same as those in Alternative Group A are presented in *italics*.

- *modification of the T Plant Complex to provide the capability for treating some MLLW and for processing and certification of some TRU waste for shipment to WIPP*

- *treatment of other MLLW and some non-conforming LLW at commercial facilities, followed by return to the Hanford Site for disposal*

- *continued operation of the WRAP to process and certify some TRU waste for shipment to WIPP*

- *shipment of all TRU waste to WIPP following processing and certification*

- Alternative Group E_1—disposal of LLW and MLLW in a lined modular facility in the 200 East Area LLBGs and disposal of melters and ILAW in a lined modular facility at the ERDF

- Alternative Group E_2—disposal of LLW and MLLW in a lined modular facility near the PUREX Plant and disposal of melters and ILAW at the ERDF

- Alternative Group E_3—disposal of LLW and MLLW in a lined modular facility at the ERDF and disposal of melters and ILAW in a lined modular facility near the PUREX Plant

- capping the lined modular facilities with a modified RCRA Subtitle C cover.

No Action Alternative

This analysis consists of the combined impacts associated with the No Action Alternative for LLW, MLLW, TRU waste, and ILAW as described in Section 3. The Hanford Only waste volume and the Lower Bound waste volume as defined in Section 3 were used for evaluation purposes. This No Action Alternative consists of continuing current solid waste management practices including implementing the Tank Waste Remediation System (TWRS) Record of Decision (ROD) (62 FR 8693). Actions evaluated as part of the No Action Alternative include those listed below. Actions that are the same as those in Alternative Group A are presented in *italics*.

- treatment of a limited quantity of MLLW at commercial facilities, followed by return to the Hanford Site

- disposal of LLW in the LLBGs in trenches of a design similar to those currently employed

- backfilling LLW trenches to grade with no cap

- disposal of MLLW in the two existing MLLW trenches until full

- capping the two MLLW trenches with a modified RCRA Subtitle C cover

- *processing and certification of some TRU waste at the WRAP for shipment to WIPP*

- *shipment of all TRU waste to WIPP following processing and certification*

- expansion of the Central Waste Complex (CWC) for storage of some non-conforming LLW, untreated MLLW, treated MLLW that exceeds the capacity of the two existing MLLW trenches, and TRU waste that cannot be certified for shipment to WIPP

- storage of melters on concrete pads at the CWC

- disposal of ILAW as glass cullet in vaults near the PUREX Plant according to the TWRS ROD (62 FR 8693).

Except where otherwise specified, all construction and operations engineering data that form the basis for environmental impact analysis of the alternatives are provided in the Technical Information Document prepared by Fluor Hanford (FH 2003).

A comparison of impacts among the alternatives appears in Section 3.4.