5.2 Air Quality

Air quality impacts covered in this section focus on four criteria pollutants[a]—nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter with aerodynamic diameters of 10 μm or smaller (PM_{10}). Hanford Solid Waste (HSW) Program activities would emit criteria pollutants as a result of the operation of diesel-fired and propane-fueled equipment. Construction, earthmoving, and transportation activities also would result in fugitive dust emissions. Major program activities that would be substantial sources of criteria pollutants include:

- construction of waste-disposal trenches (for example, LLW, MLLW, ILAW)
- waste-disposal operations
- excavation of backfill and capping materials at the borrow pit
- transportation of backfill and capping materials from the borrow pit to the disposal trenches
- backfill and capping activities at the disposal trenches
- leachate drying operations.

The air quality impacts to the public from these and related program activities are presented in this section, and additional supporting information is provided in Volume II, Appendix E. The air quality impacts from criteria pollutants emitted during the transportation of waste materials are not included in this section, but are instead addressed in Section 5.8. The potential consequences to workers and the public of the releases from radiological and hazardous chemicals are addressed in Section 5.11.

In calculating air quality impacts for criteria pollutants, data on pollutant emissions were derived from the Hanford Solid Waste Technical Information Document (FH 2004). Detailed assessments of pollutant emissions were developed for each major program element. To compute maximum air quality impacts, emissions were combined from all activities that could potentially occur at the same time. Because only 22 percent of the LLW and essentially none of the MLLW would be from offsite sources, the air quality impacts for the Hanford Only waste volume under each alternative group were conservatively modeled as being equivalent to those for the Lower Bound waste volume under the same alternative group.

The approach used to estimate pollutant emission rates and emission schedules for all HSW Program activities are addressed in detail in Volume II, Appendix E.[b]

The maximum air quality impacts that would result from the emission of criteria pollutants from HSW Program activities were calculated using the Industrial Source Complex Short-Term (ISCST3)

(a) The Clean Air Act (42 USC 7401) authorizes the U.S. Environmental Protection Agency to set permissible levels of exposure for selected air pollutants using health-based criteria. These selected pollutants are called "criteria pollutants," and their permissible exposure levels are defined in 40 CFR 50, "National Primary and Secondary Ambient Air Quality Standards."

(b) Consequences of operating accelerated process lines would be similar to those from processing TRU waste at WRAP, although timing of the consequences may vary from assumptions based on operation of WRAP with APLs.

Dispersion Model (EPA 1995). The ISCST3 model has been approved by the U.S. Environmental Protection Agency (EPA) for the calculation of the maximum, time-averaged air concentrations at user-specified receptor locations. The model provides results for averaging periods of 1 hour, 3 hours, 8 hours, 24 hours, and 1 year to correspond to the time periods specified in national and state ambient air quality standards. Four years of hourly Hanford Site meteorological data were used in modeling atmospheric dispersion. The ISCST3 model and the data used in model runs are discussed in more detail in Volume II, Appendix E.

In modeling air quality impacts for the public, the following conservative assumptions were made to maximize impact estimates:

- Although HSW Program activities would occur at numerous locations in and around the 200 Areas and Area C, program activities were conservatively modeled by collocating their emissions into three small area sources. These area sources were situated in the 200 West Area (near the southwestern edge of project activities), 200 East Area (near the northwestern edge of project activities), and Area C (at a site close to State Route [SR] 240). The location of each area source was set to correspond to the project work site in the associated major operating area that could generate the greatest air quality impacts to the public.

- When a project activity could potentially occur at more than one source location, the activity was conservatively assumed to occur at the location that would generate the greatest air quality impact. For example, the lined modular facility proposed in Alternative Group D could be sited at locations in or near the 200 East or 200 West Areas, depending on the subalternative selected. After assessing impacts from both potential source locations, the 200 West Area source location was used in the air quality analysis because it generated the greatest air quality impacts.

- Even though the maximum air quality impacts to the public from the 200 East and 200 West source locations would occur at markedly different locations (as discussed later in this section), it was conservatively assumed that the maximum pollutant concentrations associated with these two source locations could be summed to compute total maximum air quality impacts for emissions from both 200 Area source locations.

- Chemical decay and deposition processes were not explicitly modeled for any criteria pollutant. Neglecting these removal mechanisms would increase estimates of maximum pollutant concentrations (especially in the case of particulate matter) at publicly accessible locations.

- Pollutant emission rates from diesel-fueled engines were only assumed to comply with current emissions standards. No credit was taken for the substantial reduction in the sulfur content of diesel fuel (from a 500-ppm to a 15-ppm limit) scheduled to be phased in beginning June 2006 or a tightening of the emission standards for nitrogen dioxide and particulate matter scheduled to be phased in beginning 2007 (EPA 2000b).

As a result of these and other conservative assumptions, the estimates of short-term and long-term maximum air quality impacts presented in this section should be substantially greater than what would actually be experienced during program implementation.

To meet regulatory requirements, emissions from program activities must not result in air concentrations of criteria pollutants that exceed regulatory limits. The ISCST3 model predicted the locations of the maximum air quality impacts to the public from emissions at the 200 East Area, 200 West Area, and Area C source locations. These are provided in Table 5.3 for the 200 East and 200 West Areas and in Table 5.4 for Area C. The location of maximum impact varies based on the averaging period of exposure. The maximum shorter-term air quality impacts (for example, 1 hour and 3 hours) generally occur at or near the closest point of public access. The locations of the longer-term maximum air quality impacts (for example, 24 hours and annual) are heavily dependent on local, prevailing wind directions and other meteorological conditions. Dispersion factors also are provided in Tables 5.3 and 5.4 to provide relative estimates of the maximum impacts from a unit release (for example, one unit of mass emitted per second) of a generic pollutant.

In the following sections, the results of the air quality analysis are presented for Alternative Groups A through E and the No Action Alternative. Separate results are provided for the maximum air quality impacts to the public from emissions in the 200 Areas and emissions in Area C.

Table 5.3. 200 East and 200 West Area Emissions: Location and Dispersion Factors Used to Determine Maximum Air Quality Impacts to the Public

Area	Averaging Time Period	Maximum Impact Location and Corresponding Public Access	Distance and Direction from Pollutant Release Location to Maximum Public Impact Location[(a)]	Dispersion Factor for Maximum Impact Location (s/m^3)[(b)]
200E	1 hr	SR 240	8.5 km–SW	8.4E-05
	3 hr	SR 240	9.0 km–SSW	3.3E-05
	8 hr	SR 240	9.0 km–SSW	2.2E-05
	24 hr	Hanford Site boundary	15.3 km–WNW	9.3E-06
	Annual	Hanford Site boundary	13.9 km–WNW	8.9E-08
200W	1 hr	SR 240	4.0 km–S	1.6E-04
	3 hr	SR 240	4.0 km–S	7.4E-05
	8 hr	SR 240	4.0 km–S	5.1E-05
	24 hr	Hanford Site boundary	8.5 km–WNW	1.6E-05
	Annual	Hanford Site boundary	11.5 km–W	1.5E-07

(a) Distance and direction determined by dispersion modeling. Pollutant transport direction is reported using 16 compass sectors—starting with N (North) and continuing clockwise with NNE, NE, ENE, E (East), ESE, SE, SSE, S (South), SSW, SW, WSW, W (West), WNW, NW, and NNW.

(b) Values computed by the ISCST3 model. To convert to a concentration estimate ($\mu g/m^3$), a dispersion factor (s/m^3) is multiplied by the estimated pollutant release rate ($\mu g/s$).

Table 5.4. Area C (Borrow Pit) Emissions: Location and Dispersion Factors Used to Determine Maximum Air Quality Impacts to the Public

Averaging Time Period	Maximum Impact Location and Corresponding Public Access	Distance and Direction from Pollutant Release Location to Maximum Public Impact Location[(a)]	Dispersion Factors for Maximum Impact Location (s/m^3)[(b)]
1 hr	SR 240	<150 m NE	3.3E-03
3 hr	SR 240	<150 m NE	2.5E-03
8 hr	SR 240	<150 m NE	1.9E-03
24 hr	Hanford Site boundary	14.4 km WNW	1.0E-05
Annual	Hanford Site boundary	13.8 km WNW	9.2E-08

(a) Distance determined by dispersion modeling. Pollutant transport direction is reported using 16 compass sectors—starting with N (North) and continuing clockwise with NNE, NE, ENE, E (East), ESE, SE, SSE, S (South), SSW, SW, WSW, W (West), WNW, NW, and NNW.

(b) Values computed by the ISCST3 model. To convert to a concentration estimate ($\mu g/m^3$), the dispersion factor (s/m^3) is multiplied by the estimated pollutant release rate ($\mu g/s$).

A Clean Air Act General Conformity Review analysis is presented in Volume II, Appendix E. Based on this analysis, it was concluded that a Conformity Determination would not be needed.

5.2.1 Alternative Group A

Project activities that would generate air quality impacts under Alternative Group A include the use of diesel-fueled equipment to construct new trenches of deeper and wider design than current trenches, construction of the ILAW and melter trenches, backfilling of trenches, capping the LLBGs and the ILAW trench at closure, performing routine CWC and T Plant operations, modifying the T Plant to achieve a waste processing capability, and the excavation and transportation of materials from the borrow pit. In addition, propane-fueled pulse driers would be used to treat leachate from the MLLW trenches beginning in 2026. Fugitive dust emissions would be associated with many major construction and operation activities.

For Alternative Group A (Hanford Only and Lower Bound waste volumes), the largest air quality impacts would occur during two different periods of project operation. In 2006, ILAW trench construction and MLLW capping and backfill operations would be underway. The heavy use of construction equipment for short periods of time would produce the maximum 24-hour and shorter-term average concentrations for SO_2 and CO. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce the maximum 24-hour and annual concentrations of PM_{10} and maximum annual concentrations of NO_2 and SO_2.

For Alternative Group A (Upper Bound waste volume), the largest air quality impacts would occur during three different periods of project operation. In 2006, the heavy use of construction equipment would produce the maximum concentrations over all averaging periods for CO, SO_2, and NO_2. In 2018, LLW and ILAW trench construction, coupled with MLLW melter capping and backfilling operations,

would generate the maximum 24-hour PM_{10} concentrations. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce the maximum annual concentrations of PM_{10}.

Estimates of the maximum air quality impacts to the public from activities in the 200 Areas under Alternative Group A are summarized in Table 5.5. Estimates of the maximum air quality impacts from Area C activities are presented in Table 5.6. The maximum air quality impacts from Area C activities are the same for all alternative groups. The impacts from the single activity undertaken in Area C are less than the maximum impacts from the multiple activities undertaken in Alternative Group A.

Even in the years with the largest potential air quality impacts, ambient air quality standards (see Table 4.6, Section 4.3.3) would not be exceeded under Alternative Group A. The largest potential impacts to the public from activities at Area C would result from SO_2 and CO emissions. Maximum air

Table 5.5. Alternative Group A: Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

Pollutant	Averaging Time	Ambient Air Quality Standard ($\mu g/m^3$)	Hanford Only & Lower Bound Waste Volumes		Upper Bound Waste Volume	
			Maximum Air Quality Impacts ($\mu g/m^3$)	Percent of Standard	Maximum Air Quality Impacts ($\mu g/m^3$)	Percent of Standard
PM_{10}	24 hr	150	69	46	74	49
	Annual	50	0.61	1.2	0.62	1.2
SO_2	1 hr	1,000	81	8.1	98	9.8
	3 hr	1,300	38	2.9	45	3.5
	24 hr	260	2.7	1.0	3.5	1.3
	Annual	50	0.017	0.034	0.019	0.038
CO	1 hr	40,000	1,500	3.8	900	4.6
	8 hr	10,000	470	4.7	590	5.9
NO_2	Annual	100	0.72	0.72	0.80	0.80

Table 5.6. All Alternative Groups: Maximum Air Quality Impacts to the Public from Area C (Borrow Pit) Activities

Pollutant	Averaging Time	Ambient Air Quality Standard ($\mu g/m^3$)	Maximum Air Quality Impacts	
			Maximum Pollutant Concentration ($\mu g/m^3$)	Percent of Standard
PM_{10}	24 hr	150	21	14
	Annual	50	0.19	0.38
SO_2	1 hr	1,000	260	26
	3 hr	1,300	200	15
	24 hr	260	0.44	0.17
	Annual	50	0.0035	0.0070
CO	1 hr	40,000	6,300	16
	8 hr	10,000	3,600	36
NO_2	Annual	100	0.16	0.16

quality impacts to the public are conservatively estimated to be about 26 percent of the 1-hour SO_2 standard and 36 percent of the 8-hour CO standard. The largest potential impacts to the public from activities within the 200 Areas would involve the 24-hour PM_{10} standard. Using the series of conservative assumptions employed in the air-dispersion modeling, this maximum air quality impact would be about half of the 24-hour PM_{10} standard.

5.2.2 Alternative Group B

Project activities that would generate air quality impacts under Alternative Group B include the use of diesel-fueled equipment to construct additional trenches of current design and the ILAW and melter trenches, backfilling and capping activities in the LLBGs, construction of a new waste processing facility, and the excavation of materials at the borrow pit. In addition, propane would be used to fuel vehicles at the CWC and to operate pulse driers used to treat leachate from the MLLW trenches. Fugitive dust would be associated with all major construction and operation activities.

For Alternative Group B (Hanford Only and Lower Bound waste volumes), the largest air quality impacts would occur during two different periods of project operation. In 2011, ILAW trench construction, LLW trench construction, and MLLW capping and backfill operations would be underway. The heavy use of construction equipment for short periods of time would produce the maximum pollutant concentrations for CO, SO_2, and NO_2. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce maximum 24-hour and annual concentrations of PM_{10} that would be slightly greater than in 2011.

For Alternative Group B (Upper Bound waste volume), the largest air quality impacts would occur during three different periods of project operation. In 2006, the heavy use of construction equipment would produce the maximum pollutant concentrations over the relevant 1-hour, 3-hours, 8-hours, and 24-hour averaging periods for CO and SO_2. In 2011, LLW and ILAW trench construction, coupled with MLLW melter capping and backfilling operations, would generate the maximum annual SO_2 and NO_2 concentrations. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce the maximum 24-hour and annual concentrations of PM_{10}.

Estimates of the maximum air quality impacts to the public from activities in the 200 Areas under Alternative Group B are summarized in Table 5.7. Estimates of the maximum air quality impacts from Area C activities are the same for all alternative groups (see Table 5.6).

All air quality impacts to the public under Alternative Group B would be within ambient air quality standards (see Table 4.6, Section 4.3.3). The largest potential impact to the public from activities at Area C would result from SO_2 and CO emissions. The largest potential air quality impacts to the public from 200 Area emissions would involve the 24-hour PM_{10} air concentration. Even using the series of conservative assumptions employed in the dispersion modeling, the maximum air quality impact to the public for the Upper Bound waste volume would be about 60 percent of the applicable air quality standard. Maximum impacts for the Hanford Only and Lower Bound waste volumes would be less than 47 percent of the applicable standards.

Table 5.7. Alternative Group B: Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

			Hanford Only & Lower Bound Waste Volumes		Upper Bound Waste Volume	
Pollutant	**Averaging Time**	**Ambient Air Quality Standard ($\mu g/m^3$)**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**
PM_{10}	24 hr	150	71	47	90	60
	Annual	50	0.62	1.2	0.65	1.3
SO_2	1 hr	1,000	130	13	180	18
	3 hr	1,300	61	4.7	85	6.5
	24 hr	260	4.7	1.8	6.4	2.5
	Annual	50	0.021	0.042	0.021	0.042
CO	1 hr	40,000	2,500	6.3	3,400	8.5
	8 hr	10,000	800	8.0	1,100	11
NO_2	Annual	100	1.0	1.0	1.1	1.1

5.2.3 Alternative Group C

Project activities that would generate air quality impacts under Alternative Group C include the use of diesel-fueled equipment to construct new expandable trenches for LLW and for MLLW, construction of the ILAW and melter trenches, backfilling of trenches, capping the LLBGs and the ILAW trench at closure, performing routine CWC and T Plant operations, modifying the T Plant for a new waste processing capability, and the excavation and transportation of materials from the borrow pit. In addition, propane engines would be used at the CWC and to operate pulse driers used to treat leachate from the MLLW trenches. Fugitive dust would be associated with all major construction and operation activities.

For Alternative Group C (Hanford Only and Lower Bound waste volumes), the largest air quality impacts would occur during three different periods of project operation. In 2007, the heavy use of construction equipment would produce the maximum pollutant concentrations over 1-hour and 3-hour averaging periods for SO_2. In 2018, ILAW trench construction and MLLW capping and backfill operations would be under way. This use of construction equipment for long periods of time would produce the maximum 24-hour and annual concentrations for SO_2, the maximum 1-hour and 8-hour pollutant concentrations for CO, and the maximum annual concentration of NO_2. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce the maximum 24-hour and annual concentrations of PM_{10}.

For Alternative Group C (Upper Bound waste volume), the largest air quality impacts would occur during four different periods of project operation. In 2007, the construction of ILAW, LLW, and MLLW trenches would produce the maximum concentrations over 1-hour and 3-hour averaging periods for SO_2 and an 8-hour averaging period for CO. In 2018, ILAW trench construction, coupled with MLLW melter capping and backfilling operations, would generate the maximum 24-hour and annual concentrations of

SO_2, annual concentrations of NO_2, and 1-hour concentrations of CO. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce the maximum 24-hour and annual concentrations of PM_{10}.

Estimates of the maximum air quality impacts to the public from activities in the 200 Areas under Alternative Group C are summarized in Table 5.8. Estimates of the maximum air quality impacts from Area C activities are the same for all alternative groups (see Table 5.6).

All air quality impacts to the public from Alternative Group C would be within ambient air quality standards (see Table 4.6, Section 4.3.3). The largest potential impacts to the public from activities at Area C would result from SO_2 and CO emissions. The largest potential air quality impacts to the public from activities in the 200 Areas would involve the 24-hour PM_{10} concentration. Even using the series of conservative assumptions employed in the dispersion modeling, this maximum air quality impact would be about 40 percent of the applicable air quality standard.

5.2.4 Alternative Groups D_1, D_2, and D_3

Project activities that would generate air quality impacts under Alternative Groups D_1, D_2, and D_3 (collectively referred to in this section as Alternative Group D) include the use of diesel-fueled equipment to construct a lined modular facility to hold the LLW, MLLW, ILAW and melters, backfilling and capping activities in the LLBGs, the modification of T Plant, and the excavation of materials at the borrow pit. In addition, propane would be used at the CWC and to operate pulse driers used to treat leachate from the MLLW trenches. Fugitive dust would be associated with all major construction and operation activities. Alternative Groups D_1, D_2, and D_3 postulate different locations for the lined modular

Table 5.8. Alternative Group C: Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

			Hanford Only & Lower Bound Waste Volumes		Upper Bound Waste Volume	
Pollutant	**Averaging Time**	**Ambient Air Quality Standard ($\mu g/m^3$)**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**
PM_{10}	24 hr	150	60	40	61	41
	Annual	50	0.53	1.1	0.54	1.1
SO_2	1 hr	1,000	79	7.9	80	8.0
	3 hr	1,300	36	2.8	37	2.8
	24 hr	260	2.9	1.1	2.9	1.1
	Annual	50	0.018	0.036	0.018	0.036
CO	1 hr	40,000	1,500	3.8	1,500	3.8
	8 hr	10,000	460	4.6	470	4.7
NO_2	Annual	100	0.77	0.77	0.77	0.77

facility. In conducting air quality modeling, a conservative 200 West Area source location was assumed in all cases for the lined modular facility. As a result, the air quality estimates for Alternative Groups D_1, D_2, and D_3 are equivalent.

For Alternative Group D (Hanford Only, Lower Bound, and Upper Bound waste volumes), the largest air quality impacts would occur during two different periods of project operation. In 2006, the lined modular facility construction and capping of an existing MLLW trench would be under way. The heavy use of construction equipment for short periods of time would produce the maximum average pollutant concentrations for CO, SO_2, and NO_2. After disposal operations cease, the lined modular facility capping operations would be in full swing. This sustained activity would produce the maximum 24-hour and annual concentrations of PM_{10}.

Estimates of the maximum air quality impacts to the public from activities in the 200 Areas under Alternative Group D are summarized in Table 5.9. Estimates of the maximum air quality impacts from Area C activities are the same for all alternative groups (see Table 5.6).

All air quality impacts from Alternative Group D would be within ambient air quality standards. The largest potential impacts to the public from Area C activities would result from SO_2 and CO emissions. The largest potential air quality impacts to the public from activities in the 200 Areas would involve the 24-hour PM_{10} air concentration. Using the series of conservative assumptions employed in the dispersion modeling, this maximum air quality impact would be about 41 percent of the applicable air quality standard.

Table 5.9. Alternative Group D: Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

			Hanford Only & Lower Bound Waste Volumes		Upper Bound Waste Volume	
Pollutant	**Averaging Time**	**Ambient Air Quality Standard ($\mu g/m^3$)**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**
PM_{10}	24 hr	150	61	41	62	41
	Annual	50	0.53	1.1	0.54	1.1
SO_2	1 hr	1,000	84	8.4	84	8.4
	3 hr	1,300	38	2.9	38	2.9
	24 hr	260	3.1	1.2	3.1	1.2
	Annual	50	0.019	0.038	0.019	0.038
CO	1 hr	40,000	1,590	4.0	1,590	4.0
	8 hr	10,000	500	5.0	500	5.0
NO_2	Annual	100	0.79	0.79	0.85	0.85

5.2.5 Alternative Groups E_1, E_2, and E_3

Project activities that would generate air quality impacts under Alternative Groups E_1, E_2, and E_3 (collectively referred to in this section as Alternative Group E) include the use of diesel-fueled equipment to construct a lined modular facility for LLW and MLLW, construction of the ILAW and melter trenches, backfilling and capping activities in the LLBGs, modification of T Plant, and the excavation of materials at the borrow pit. In addition, propane engines would be used at the CWC and to operate pulse driers used to treat leachate from the MLLW trenches. Fugitive dust would be associated with all major construction and operation activities. Alternative Groups E_1, E_2, and E_3 postulate different locations for the lined modular facility. In conducting air quality modeling, a conservative 200 West Area source location was assumed in all cases for the lined modular facility. As a result, the air quality estimates for Alternative Groups E_1, E_2, and E_3 are equivalent.

For Alternative Group E (Hanford Only, Lower Bound, and Upper Bound waste volumes), the largest air quality impacts would occur during three different periods of project operation. In 2006, the heavy use of construction equipment for concurrent construction of LLW, MLLW, and ILAW trenches and the capping of an existing MLLW trench would produce the maximum 24-hour and annual concentrations of SO_2. In 2007, trench construction activities would be underway, which would produce the maximum 1- and 8-hour concentrations of CO, the maximum 1- and 3-hour concentrations of SO_2, and the maximum annual NO_2 concentrations. After disposal operations cease, LLBG and ILAW capping operations would be in full swing. This sustained activity would produce the maximum 24-hour and annual concentrations of PM_{10}.

Estimates of the maximum air quality impacts to the public from activities in the 200 Areas under Alternative Group E are summarized in Table 5.10. Estimates of the maximum air quality impacts to the public from Area C activities are the same for all alternative groups (see Table 5.6).

All air quality impacts from Alternative Group E would be within ambient air quality standards (see Table 4.6, Section 4.3.3). The largest potential impacts to the public from activities at Area C would result from SO_2 and CO emissions. The largest potential air quality impact to the public from activities in the 200 Areas would involve the 24-hour PM_{10} air concentration. Using the series of conservative assumptions employed in the dispersion modeling, this maximum air quality impact would be about 41 percent of the applicable air quality standard.

5.2.6 No Action Alternative

Project activities that would generate air quality impacts under the No Action Alternative include the use of diesel-fueled equipment during construction of additional trenches of current design, construction of the ILAW trench and 66 CWC buildings, backfilling the LLW and MLLW trenches, capping two existing MLLW trenches, and excavation of materials at the borrow pits. A propane-fueled pulse drier would be used to treat MLLW trench leachate, beginning in 2026. Fugitive dust would be associated with all major construction and operation activities.

Table 5.10. Alternative Group E: Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

			Hanford Only & Lower Bound Waste Volumes		Upper Bound Waste Volume	
Pollutant	**Averaging Time**	**Ambient Air Quality Standard ($\mu g/m^3$)**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**	**Maximum Air Quality Impacts ($\mu g/m^3$)**	**Percent of Standard**
PM_{10}	24 hr	150	60	40	62	41
	Annual	50	0.53	1.1	0.54	1.1
SO_2	1 hr	1,000	93	9.3	95	9.5
	3 hr	1,300	42	3.2	42	3.2
	24 hr	260	3.1	1.2	3.2	1.2
	Annual	50	0.019	0.038	0.020	0.040
CO	1 hr	40,000	1,700	4.3	1,700	4.3
	8 hr	10,000	530	5.3	530	5.3
NO_2	Annual	100	0.89	0.89	0.89	0.89

For the No Action Alternative (Hanford Only and Lower Bound waste volumes), the largest air quality impacts would occur during two different periods of project operation. In 2007, the heavy use of construction equipment to construct LLW trenches and CWC buildings, the capping of existing MLLW trenches, and propane use at CWC would produce the maximum 24-hour and annual concentrations of PM_{10}. In 2034, ILAW vault and final LLW trench construction would be underway, and propane for CWC and pulse drier operations would be at their peak. These activities would produce the maximum concentrations of SO_2 over all averaging periods, the maximum annual concentrations of NO_2, and the maximum 1- and 8-hour concentrations of CO.

Estimates of the maximum air quality impacts to the public from activities in the 200 Areas under the No Action Alternative are presented in Table 5.11. Estimates of the maximum air quality impacts to the public from Area C activities are the same for all alternative groups (see Table 5.6).

All air quality impacts from the No Action Alternative would be within ambient air quality standards (see Table 4.6, Section 4.3.3). The largest potential impacts to the public from Area C activities would result from SO_2 and CO emissions. The largest potential air quality impact from emissions in the 200 Areas would involve the 24-hour PM_{10} air concentration. Using the series of conservative assumptions employed in the dispersion modeling, this maximum air quality impact would be about 38 percent of the applicable air quality standard.

Table 5.11. No Action Alternative: Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

Pollutant	Averaging Time	Ambient Air Quality Standard ($\mu g/m^3$)	Maximum Air Quality Impacts	
			Maximum Pollutant Concentration ($\mu g/m^3$)	Percent of Standard
PM_{10}	24 hr	150	57	38
	Annual	50	0.37	0.74
SO_2	1 hr	1,000	86	8.6
	3 hr	1,300	35	2.7
	24 hr	260	3.4	1.3
	Annual	50	0.019	0.038
CO	1 hr	40,000	1,600	4.0
	8 hr	10,000	460	4.6
NO_2	Annual	100	0.85	0.85

5.2.7 Comparison of the Alternative Groups

Table 5.12 presents a summary comparison across all alternative groups of maximum ambient air quality impacts to the public from activities in the 200 Areas. The greatest air quality impacts are experienced under Alternative Group B–Upper Bound waste volume. Depending on the pollutant and averaging period, the lowest air quality impacts are experienced under Alternative Group A–Hanford Only and Lower Bound waste volumes, Alternative Group C–Hanford Only and Lower Bound waste volumes, Alternative Group C–Upper Bound waste volume, and the No Action Alternative.

The only air quality impacts to the public from activities in the 200 Areas that would exceed 10 percent of their applicable ambient air quality standards would be the maximum 24-hour concentration of PM_{10}, 1-hour concentration of SO_2, and 8-hour concentration of CO. Only the maximum 24-hour concentration of PM_{10} under Alternative Group B–Upper Bound waste volume would exceed 50 percent of the applicable air quality standard. For activities in Area C, the maximum 1- and 8-hour concentrations of CO, 1- and 3-hour concentrations of SO_2, and 24-hour concentration of PM_{10} would be greater than 10 percent of the applicable ambient air quality standards (see Table 5.6). None of these impacts would exceed 50 percent of the applicable air quality standard.

It should be re-emphasized that the air quality impacts presented above are all based on a series of conservative assumptions. In particular, the incorporation of particulate deposition processes in the air quality modeling or the consideration of more stringent vehicle pollutant emission standards that are currently scheduled for future implementation would substantially reduce estimates of many maximum air quality impacts.

It is important to note that the maximum short-term air quality impacts to the public from activities in the 200 East and 200 West Areas and Area C should not be summed to come up with a combined air quality impact. For averaging periods of 24 hours and less, the maximum air quality impacts to the public from emissions in the 200 Areas and Area C would occur under markedly different flow regimes and

would therefore occur at different times and have different impact locations. As a result, the maximum short-term air quality impacts to the public from emissions at one source location would not be appreciably impacted by emissions from the other source location. For annual air quality impacts to the public, it is extremely conservative to sum maximum annual impacts from different source locations to estimate the maximum cumulative impact. For the HSW Program, the combined maximum annual air quality impacts from emissions in each source location would be very small (that is, less than 2 percent of any annual air quality standard).

Table 5.12. Comparison Across all Alternative Groups of Maximum Air Quality Impacts to the Public from Activities in the 200 Areas

		Maximum Air Quality Impacts in Terms of Percent of the Associated Ambient Air Quality Standard										
		Alternative Group A		Alternative Group B		Alternative Group C		Alternative Group D		Alternative Group E		No Action
Pollutant	Averaging Time	Hanford & Lower Bound Waste Volumes	Upper Bound Waste Volume	Hanford & Lower Bound Waste Volumes	Upper Bound Waste Volume	Hanford & Lower Bound Waste Volumes	Upper Bound Waste Volume	Hanford & Lower Bound Waste Volumes	Upper Bound Waste Volume	Hanford & Lower Bound Waste Volumes	Upper Bound Waste Volume	Hanford & Lower Bound Waste Volumes
PM_{10}	24 hr	46	49	47	60	40	41	41	41	40	41	38
	Annual	1.2	1.2	1.2	1.3	1.1	1.1	1.1	1.1	1.1	1.1	0.74
SO_2	1 hr	8.1	9.8	13	18	7.9	8.0	8.4	8.4	9.3	9.5	8.6
	3 hr	2.9	3.5	4.7	6.5	2.8	2.8	2.9	2.9	3.2	3.2	2.7
	24 hr	1.0	1.3	1.8	2.5	1.1	1.1	1.2	1.2	1.2	1.2	1.3
	Annual	0.034	0.038	0.042	0.042	0.036	0.036	0.038	0.038	0.038	0.040	0.038
CO	1 hr	3.8	4.6	6.3	8.5	3.8	3.8	4.0	4.0	4.3	4.3	4.0
	8 hr	4.8	5.9	8.0	11	4.6	4.7	5.0	5.0	5.3	5.3	4.6
NO_2	Annual	0.72	0.80	1.0	1.1	0.77	0.77	0.79	0.85	0.89	0.89	0.85