

Appendix G Air Quality

This appendix presents detailed information that support the air quality impact assessments in Chapter 4. Data are provided for the four candidate U.S. Department of Energy sites: the Hanford Site (Hanford), Idaho National Engineering and Environmental Laboratory (INEEL), the Pantex Plant (Pantex), and the Savannah River Site (SRS).

G.1 HANFORD

G.1.1 Assessment Data

Emission rates for criteria, hazardous, and toxic air pollutants at Hanford are presented in Table F.1.2.2–1 of the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement (Storage and Disposition PEIS)* (DOE 1996a:F-6). These emission rates were used as input into the modeled No Action Alternative pollutant concentrations presented in that environmental impact statement (EIS) and reflect projected Hanford facility emissions for 2005. The storage alternative selected for Hanford results in no change in these concentrations (DOE 1996a:4-34). In addition to the concentrations projected for 2005, the concentrations for the Phased Implementation Alternative—Phase II Operation of the vitrification facilities presented in the *Tank Waste Remediation System Final EIS* (DOE 1996b:5-68) were included in the estimate of the No Action concentration for surplus plutonium disposition as shown in Table G–1. Other onsite activities related to programs analyzed in EISs for spent nuclear fuel and waste management are also included. Other activities at Hanford that may occur during the time period 2005–2015 are discussed in the cumulative impacts section. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–1. Estimated Concentrations ($\mu\text{g}/\text{m}^3$) From No Action at Hanford

| Pollutant | Averaging Period | PEIS Estimated Base Year (2005) | Tank Waste Remediation | Other Onsite From PEIS | No Action |
|------------------------------|------------------|---------------------------------|------------------------|------------------------|-----------|
| Carbon monoxide | 8 hours | 0.08 | 34 | 0 | 34.1 |
| | 1 hour | 0.30 | 48 | 0 | 48.3 |
| Nitrogen dioxide | Annual | 0.03 | 0.12 | 0.1 | 0.25 |
| | 24 hours | <0.01 | 0.0079 | 0 | 0.0179 |
| Sulfur dioxide | Annual | 0.02 | 0.75 | 0 | 0.77 |
| | 24 hours | <0.01 | 0.02 | 1.6 | 1.63 |
| Total suspended particulates | Annual | <0.01 | 1.6 | 7.3 | 8.91 |
| | 24 hours | 0.01 | 3.6 | 26 | 29.6 |
| | 1 hour | 0.02 | 4.0 | 29 | 32.9 |
| Benzene | Annual | <0.01 | 0.0079 | 0 | 0.0179 |
| | 24 hours | <0.02 | 0.75 | 0 | 0.77 |
| Benzenes | Annual | (a) | 0.000006 | 0 | 0.000006 |
| [Text deleted.] | | | | | |

^a No sources of this pollutant have been identified at the site.

Key: PEIS, *Storage and Disposition PEIS*.

Source: DOE 1996a:4-34, 4-912; 1996b:5-68.

G.1.2 Facilities

G.1.2.1 Pit Conversion Facility

G.1.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from modification of the Fuels and Materials Examination Facility (FMEF) and construction of support facilities for pit disassembly and conversion at Hanford were analyzed using the Industrial Source Complex Model, Short-Term, Version 3 (ISCST3) as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-2.

Table G-2. Emissions (kg/yr) From Construction of Pit Conversion Facility in FMEF at Hanford

| Pollutant | Diesel Equipment and Construction Fugitive | |
|------------------------------|--|----------|
| | Emissions | Vehicles |
| Carbon monoxide | 1,000 | 11,300 |
| Nitrogen dioxide | 2,400 | 3,040 |
| PM ₁₀ | 3,500 | 10,300 |
| Sulfur dioxide | 160 | 0 |
| Volatile organic compounds | 200 | 1,400 |
| Total suspended particulates | 9,300 | 10,300 |

Key: FMEF, Fuels and Materials Examination Facility.
Source: UC 1998a.

Maximum air pollutant concentrations from construction activities are summarized in Table G-3.

Table G–3. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of Pit Conversion Facility in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|------------------|------------------------------------|-----------|--------------|-------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.277 | 34.4 |
| | 1 hour | 40,000 | 48.3 | 1.88 | 50.2 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0199 | 0.27 |
| PM ₁₀ | Annual | 50 | 0.0179 | 0.029 | 0.047 |
| | 24 hours | 150 | 0.77 | 0.323 | 1.09 |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.00133 | 1.63 |
| | 24 hours | 260 | 8.91 | 0.0148 | 8.93 |
| | 3 hours | 1,300 | 29.6 | 0.1 | 29.7 |
| | 1 hour | 660 ^b | 32.9 | 0.301 | 33.2 |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.0771 | 0.095 |
| | 24 hours | 150 | 0.77 | 0.857 | 1.63 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the pit conversion and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–4. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 36 m (118 ft) height, 3.88 m (12.7 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 3.3 m/s (10.8 ft/s). There was no boiler modeled because heating requirements would be met using electric power (UC 1998a).

Table G–4. Emissions (kg/yr) From Operation of Pit Conversion Facility in FMEF at Hanford

| Pollutant | Emergency | | |
|------------------------------|-----------|---------|----------|
| | Generator | Process | Vehicles |
| Carbon monoxide | 520 | 0 | 41,800 |
| Nitrogen dioxide | 2,000 | 0 | 11,200 |
| PM ₁₀ | 50 | 0 | 38,100 |
| Sulfur dioxide | 34 | 0 | 0 |
| Volatile organic compounds | 58 | 0 | 5,150 |
| Total suspended particulates | 50 | 0 | 38,100 |

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998a.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G-5. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-5. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Pit Conversion Facility in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent | No Action | Contribution | Total |
|------------------------------|------------------|------------------------------------|-----------|--------------|--------|
| | | Standard or Guideline ^a | | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.144 | 34.2 |
| | 1 hour | 40,000 | 48.3 | 0.978 | 49.3 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0166 | 0.267 |
| PM ₁₀ | Annual | 50 | 0.0179 | 0.000415 | 0.0183 |
| | 24 hours | 150 | 0.77 | 0.00461 | 0.775 |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.000282 | 1.63 |
| | 24 hours | 260 | 8.91 | 0.00313 | 8.91 |
| | 3 hours | 1,300 | 29.6 | 0.0213 | 29.6 |
| | 1 hour | 660 ^b | 32.9 | 0.064 | 33.0 |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.000415 | 0.0183 |
| | 24 hours | 150 | 0.77 | 0.00461 | 0.775 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.2 Immobilization Facility

G.1.2.2.1 Construction of Immobilization Facility

Potential air quality impacts from modification of FMEF and construction of support facilities for plutonium conversion and immobilization (ceramic or glass) at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-6.

Table G–6. Emissions (kg/yr) From Construction of Immobilization Facility in FMEF at Hanford

| Pollutant | Diesel | Construction | Concrete | Vehicles |
|------------------------------|------------------|---------------------------------|-----------------|----------|
| | Equipment | Fugitive Emissions ^a | Batch Plant | |
| Carbon monoxide | 1,170 | 0 | 0 | 39,900 |
| Nitrogen dioxide | 3,010 | 0 | 0 | 10,700 |
| PM ₁₀ | 230 ^b | 193 ^b | 65 ^b | 36,400 |
| Sulfur dioxide | 310 | 0 | 0 | 0 |
| Volatile organic compounds | 240 | 0 | 0 | 4,920 |
| Total suspended particulates | 230 | 193 | 65 | 36,400 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1999a, 1999b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–7.

Table G–7. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of Immobilization Facility in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | | Total |
|------------------------------|------------------|---|------------------|---------|-------|
| | | No Action | Ceramic or Glass | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.324 | 34.4 |
| | 1 hour | 40,000 | 48.3 | 2.2 | 50.5 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.025 | 0.275 |
| | Annual | 50 | 0.0179 | 0.00405 | 0.022 |
| PM ₁₀ | 24 hours | 150 | 0.77 | 0.158 | 0.928 |
| | Annual | 50 | 1.63 | 0.00257 | 1.63 |
| Sulfur dioxide | 24 hours | 260 | 8.91 | 0.0286 | 8.94 |
| | 3 hours | 1,300 | 29.6 | 0.194 | 29.8 |
| | 1 hour | 660 ^b | 32.9 | 0.583 | 33.5 |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.00405 | 0.022 |
| | 24 hours | 150 | 0.77 | 0.158 | 0.928 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.2.2 Operation of Immobilization Facility

Potential air quality impacts from operation of immobilization (ceramic or glass) and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–8. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35.6 m (116.8 ft) height, 3.88 m (12.7 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 3.3 m/s (10.8 ft/s). There was no boiler modeled because heating requirements would be met using electric power (UC 1999a, 1999b).

Table G–8. Emissions (kg/yr) From Operation of Immobilization Facility in FMEF at Hanford

| Pollutant | Emergency Generator | Ceramic or Glass Process | Vehicles |
|------------------------------|---------------------|--------------------------|----------|
| Carbon monoxide | 980 | 0 | 46,400 |
| Nitrogen dioxide | 4,530 | 0 | 12,500 |
| PM ₁₀ | 320 | 0 | 42,400 |
| Sulfur dioxide | 300 | 0 | 0 |
| Volatile organic compounds | 370 | 0 | 5,720 |
| Total suspended particulates | 320 | 0 | 42,400 |

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–9. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–9. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Immobilization Facility in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent | | | Total |
|------------------------------|------------------|------------------------------------|-----------|------------------|-------|
| | | Standard or Guideline ^a | No Action | Ceramic or Glass | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.271 | 34.4 |
| | 1 hour | 40,000 | 48.3 | 1.84 | 50.1 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0376 | 0.288 |
| | PM ₁₀ | 50 | 0.0179 | 0.00265 | 0.021 |
| Sulfur dioxide | 24 hours | 150 | 0.77 | 0.0295 | 0.799 |
| | Annual | 50 | 1.63 | 0.00249 | 1.63 |
| | 24 hours | 260 | 8.91 | 0.0277 | 8.94 |
| | 3 hours | 1,300 | 29.6 | 0.188 | 29.8 |
| Total suspended particulates | 1 hour | 660 ^b | 32.9 | 0.564 | 33.5 |
| | Annual | 60 | 0.0179 | 0.00265 | 0.021 |
| | 24 hours | 150 | 0.77 | 0.0295 | 0.799 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.3 MOX Facility

G.1.2.3.1 Construction of MOX Facility

Potential air quality impacts from construction of new mixed oxide (MOX) and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–10.

Table G–10. Emissions (kg/yr) From Construction of New MOX Facility at Hanford

| Pollutant | Diesel | Construction | Concrete Batch | |
|------------------------------|------------------|---------------------------------|--------------------|----------|
| | Equipment | Fugitive Emissions ^a | Plant | Vehicles |
| Carbon monoxide | 3,840 | 0 | 0 | 37,600 |
| Nitrogen dioxide | 10,080 | 0 | 0 | 10,100 |
| PM ₁₀ | 768 ^b | 6,880 | 1,460 ^b | 34,400 |
| Sulfur dioxide | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 792 | 0 | 0 | 4,640 |
| Total suspended particulates | 768 | 13,600 | 1,460 | 34,400 |
| Toxics ^c | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis, resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Source: UC 1998b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–11.

Table G–11. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of New MOX Facility at Hanford

| Pollutant | Most Stringent Standard | | No Action | Contribution | Total |
|------------------------------|-------------------------|---------------------------|-----------|--------------|----------|
| | Averaging Period | or Guideline ^a | | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 1.06 | 35.1 |
| | 1 hour | 40,000 | 48.3 | 7.22 | 55.5 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0836 | 0.334 |
| | PM ₁₀ | 50 | 0.0179 | 0.0744 | 0.092 |
| Sulfur dioxide | 24 hours | 150 | 0.77 | 3.27 | 4.03 |
| | Annual | 50 | 1.63 | 0.00846 | 1.64 |
| | 24 hours | 260 | 8.91 | 0.094 | 9. |
| | 3 hours | 1,300 | 29.6 | 0.64 | 30.3 |
| Total suspended particulates | 1 hour | 660 ^b | 32.9 | 1.92 | 34.8 |
| | Annual | 60 | 0.0179 | 0.132 | 0.15 |
| Toxics ^c | 24 hours | 150 | 0.77 | 5.88 | 6.66 |
| | Annual | 0.12 | 0.000006 | 0.000008 | 0.000014 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) may be emitted during construction and were analyzed as benzene.

Source: EPA 1997; WDEC 1994.

G.1.2.3.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–12. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35.6 m (116.8 ft) height, 0.3048 m (1.0 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). There was no boiler modeled because heating requirements would be met using electric power (UC 1998b).

Table G–12. Emissions (kg/yr) From Operation of New MOX Facility at Hanford

| Pollutant | Emergency | | |
|------------------------------|-----------|---------|----------|
| | Generator | Process | Vehicles |
| Carbon monoxide | 374 | 0 | 34,200 |
| Nitrogen dioxide | 1,738 | 0 | 9,170 |
| PM ₁₀ | 122 | 0 | 31,200 |
| Sulfur dioxide | 114 | 0 | 0 |
| Volatile organic compounds | 142 | 0 | 4,210 |
| Total suspended particulates | 122 | 0 | 31,200 |
| [Text deleted.] | | | |
| [Text deleted.] | | | |

Source: UC 1998b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–13. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–13. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New MOX Facility at Hanford

| Pollutant | Averaging Period | Most Stringent | | No Action | Contribution | Total |
|------------------------------|------------------|------------------------------------|--|-----------|--------------|--------|
| | | Standard or Guideline ^a | | | | |
| Carbon monoxide | 8 hours | 10,000 | | 34.1 | 0.103 | 34.2 |
| | 1 hour | 40,000 | | 48.3 | 0.704 | 49.0 |
| Nitrogen dioxide | Annual | 100 | | 0.25 | 0.0144 | 0.264 |
| | | | | | | |
| PM ₁₀ | Annual | 50 | | 0.0179 | 0.00101 | 0.0189 |
| | 24 hours | 150 | | 0.77 | 0.0113 | 0.781 |
| Sulfur dioxide | Annual | 50 | | 1.63 | 0.000946 | 1.63 |
| | 24 hours | 260 | | 8.91 | 0.0105 | 8.92 |
| | 3 hours | 1,300 | | 29.6 | 0.0715 | 29.7 |
| | 1 hour | 660 ^b | | 32.9 | 0.214 | 33.1 |
| Total suspended particulates | Annual | 60 | | 0.0179 | 0.00101 | 0.0189 |
| | 24 hours | 150 | | 0.77 | 0.0113 | 0.781 |
| [Text deleted.] | | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

[Text deleted.]

Source: EPA 1997; WDEC 1994.

G.1.2.4 Pit Conversion and Immobilization Facilities

G.1.2.4.1 Construction of Pit Conversion and Immobilization Facilities

Potential air quality impacts from modification of FMEF and construction of support facilities for pit disassembly and conversion and plutonium conversion and immobilization (ceramic or glass) at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction

equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-14.

Table G-14. Emissions (kg/yr) From Construction of Pit Conversion and Immobilization Facilities in FMEF at Hanford

| Pollutant | Pit Conversion | | Immobilization | | | |
|------------------------------|--|----------|------------------|--|----------------------|----------|
| | Diesel Equipment and Construction Fugitive Emissions | Vehicles | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 1,000 | 11,300 | 3,060 | 0 | 0 | 40,000 |
| Nitrogen dioxide | 2,400 | 3,040 | 7,890 | 0 | 0 | 10,700 |
| PM ₁₀ | 3,500 | 10,300 | 600 ^b | 6,770 | 560 ^b | 36,500 |
| Sulfur dioxide | 160 | 0 | 800 | 0 | 0 | 0 |
| Volatile organic compounds | 200 | 1,400 | 620 | 0 | 0 | 4,930 |
| Total suspended particulates | 9,300 | 10,300 | 600 | 13,100 | 560 | 36,500 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998a, 1999a, 1999b.

Maximum air pollutant concentrations from construction activities are summarized in Table G-15.

Table G-15. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of Pit Conversion and Immobilization Facilities in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | Pit Conversion | Immobilization (Ceramic or Glass) | Total |
|------------------------------|------------------|---|--------|----------------|-----------------------------------|-------|
| | | No Action | | | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.277 | 0.846 | 35.2 |
| | 1 hour | 40,000 | 48.3 | 1.88 | 5.76 | 55.9 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0199 | 0.0654 | 0.335 |
| | 24 hours | 150 | 0.77 | 0.323 | 2.96 | 4.05 |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.00133 | 0.00664 | 1.64 |
| | 24 hours | 260 | 8.91 | 0.0148 | 0.0737 | 9. |
| [Text deleted.] | 3 hours | 1,300 | 29.6 | 0.1 | 0.502 | 30.2 |
| | 1 hour | 660 ^b | 32.9 | 0.301 | 1.5 | 34.7 |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.0771 | 0.117 | 0.212 |
| | 24 hours | 150 | 0.77 | 0.857 | 5.58 | 7.21 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.4.2 Operation of Pit Conversion and Immobilization Facilities

Potential air quality impacts from operation of pit conversion, immobilization (ceramic or glass), and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–16. Stack parameters used for modeling were as stated previously.

Table G–16. Emissions (kg/yr) From Operation of Pit Conversion and Immobilization Facilities in FMEF at Hanford

| Pollutant | Pit Conversion | | | Immobilization | | |
|------------------------------|---------------------|---------|----------|---------------------|--------------------------|-----------------------|
| | Emergency Generator | Process | Vehicles | Emergency Generator | Ceramic or Glass Process | Vehicles ^a |
| Carbon monoxide | 520 | 0 | 41,800 | 1,460 | 0 | 57,100 |
| Nitrogen dioxide | 2,000 | 0 | 11,200 | 6,790 | 0 | 15,300 |
| PM ₁₀ | 50 | 0 | 38,100 | 480 | 0 | 52,100 |
| Sulfur dioxide | 34 | 0 | 0 | 450 | 0 | 0 |
| Volatile organic compounds | 58 | 0 | 5,150 | 550 | 0 | 7,040 |
| Total suspended particulates | 50 | 0 | 38,100 | 480 | 0 | 52,100 |

^a For 50-t (55-ton) case.

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998a, 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus No Action concentrations, are summarized in Table G–17. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–17. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Pit Conversion and Immobilization Facilities in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent | | No Action | Pit Conversion | Immobilization (Ceramic or Glass) | Total ^b |
|------------------------------|---------------------------|-------------------------------------|--------|-----------|----------------|-----------------------------------|--------------------|
| | | Standard or Guidelines ^a | | | | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.144 | 0.404 | 34.6 | |
| | 1 hour | 40,000 | 48.3 | 0.978 | 2.75 | 52. | |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0166 | 0.0563 | 0.323 | |
| PM ₁₀ | Annual | 50 | 0.0179 | 0.000415 | 0.00398 | 0.0223 | |
| | 24 hours | 150 | 0.77 | 0.00461 | 0.0443 | 0.819 | |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.000282 | 0.00373 | 1.63 | |
| | 24 hours | 260 | 8.91 | 0.00313 | 0.0415 | 8.95 | |
| | 3 hours | 1,300 | 29.6 | 0.0213 | 0.282 | 29.9 | |
| | [Text deleted.] 1 hour | 660 ^c | 32.9 | 0.064 | 0.847 | 33.8 | |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.000415 | 0.00398 | 0.0223 | |
| | 24 hours | 150 | 0.77 | 0.00461 | 0.0443 | 0.819 | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b The concentrations for ceramic and glass are the same for both 17-t and 50-t cases.

^c At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.5 Pit Conversion and MOX Facilities

G.1.2.5.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from modification of FMEF and construction of support facilities for pit disassembly and conversion and MOX fuel fabrication at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–18.

Table G–18. Emissions (kg/yr) From Construction of Pit Conversion and MOX Facilities in FMEF at Hanford

| Pollutant | Pit Conversion | | MOX | | | |
|------------------------------|--|----------|------------------|--|----------------------|----------|
| | Diesel Equipment and Construction Fugitive Emissions | Vehicles | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 1,000 | 11,300 | 778 | 0 | 0 | 37,300 |
| Nitrogen dioxide | 2,400 | 3,040 | 2,009 | 0 | 0 | 10,000 |
| PM ₁₀ | 3,500 | 10,300 | 154 ^b | 2,830 | 435 ^b | 34,100 |
| Sulfur dioxide | 160 | 0 | 204 | 0 | 0 | 0 |
| Volatile organic compounds | 200 | 1,400 | 160 | 0 | 0 | 4,600 |
| Total suspended particulates | 9,300 | 10,300 | 154 | 5,590 | 435 | 34,100 |
| Toxics ^c | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998a, 1998b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–19.

Table G–19. Concentrations (µg/m³) From Construction of Pit Conversion and MOX Facilities in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | | | |
|------------------------------|------------------|---|----------------|---------|----------|----------|
| | | No Action | Pit Conversion | MOX | Total | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.277 | 0.215 | 34.6 |
| | 1 hour | 40,000 | 48.3 | 1.88 | 1.46 | 51.6 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0199 | 0.0167 | 0.287 |
| | 24 hours | 50 | 0.0179 | 0.029 | 0.0274 | 0.0743 |
| Sulfur dioxide | Annual | 150 | 0.77 | 0.323 | 1.32 | 2.41 |
| | 24 hours | 50 | 1.63 | 0.00133 | 0.00169 | 1.63 |
| Total suspended particulates | 24 hours | 260 | 8.91 | 0.0148 | 0.0188 | 8.94 |
| | 3 hours | 1,300 | 29.6 | 0.1 | 0.128 | 29.8 |
| | [Text deleted.] | | | | | |
| Toxics ^c | 1 hour | 660 ^b | 32.9 | 0.301 | 0.384 | 33.6 |
| | Annual | 60 | 0.0179 | 0.0771 | 0.051 | 0.146 |
| Total suspended particulates | 24 hours | 150 | 0.77 | 0.857 | 2.4 | 4.03 |
| | Annual | 0.12 | 0.000006 | 0 | 0.000008 | 0.000014 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.5.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of pit conversion, MOX, and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–20. Stack parameters used for modeling were as stated previously.

Table G–20. Emissions (kg/yr) From Operation of Pit Conversion and MOX Facilities in FMEF at Hanford

| Pollutant | Pit Conversion | | | MOX | | |
|------------------------------|---------------------|---------|----------|---------------------|---------|----------|
| | Emergency Generator | Process | Vehicles | Emergency Generator | Process | Vehicles |
| Carbon monoxide | 520 | 0 | 41,800 | 374 | 0 | 34,200 |
| Nitrogen dioxide | 2,000 | 0 | 11,200 | 1,738 | 0 | 9,170 |
| PM ₁₀ | 50 | 0 | 38,100 | 122 | 0 | 31,200 |
| Sulfur dioxide | 34 | 0 | 0 | 114 | 0 | 0 |
| Volatile organic compounds | 58 | 0 | 5,150 | 142 | 0 | 4,210 |
| Total suspended particulates | 50 | 0 | 38,100 | 122 | 0 | 31,200 |
| [Text deleted.] | | | | | | |

[Text deleted.]

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998a, 1998b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–21. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–21. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Pit Conversion and MOX Facilities in FMEF at Hanford

| Pollutant | Most Stringent | | No Action | Pit Conversion | MOX | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|----------|--------|
| | Averaging Period | Standard or Guideline ^a | | | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.144 | 0.103 | 34.3 |
| | 1 hour | 40,000 | 48.3 | 0.978 | 0.704 | 50.0 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0166 | 0.0144 | 0.281 |
| PM ₁₀ | Annual | 50 | 0.0179 | 0.000415 | 0.00101 | 0.0193 |
| | 24 hours | 150 | 0.77 | 0.00461 | 0.0113 | 0.786 |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.000282 | 0.000946 | 1.63 |
| | 24 hours | 260 | 8.91 | 0.00313 | 0.0105 | 8.92 |
| | 3 hours | 1,300 | 29.6 | 0.0213 | 0.0715 | 29.7 |
| | [Text deleted.] | | | | | |
| | 1 hour | 660 ^b | 32.9 | 0.064 | 0.214 | 33.2 |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.000415 | 0.00101 | 0.0193 |
| | 24 hours | 150 | 0.77 | 0.00461 | 0.0113 | 0.786 |
| [Text deleted.] | | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

[Text deleted.]

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.6 Immobilization and MOX Facilities

G.1.2.6.1 Construction of Immobilization and MOX Facilities

Potential air quality impacts from modification of FMEF and construction of support facilities for collocating immobilization (ceramic or glass) and MOX facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–22.

Table G–22. Emissions (kg/yr) From Construction of Immobilization and MOX Facilities Collocated in FMEF at Hanford

| Pollutant | Immobilization (Ceramic or Glass) | | | | MOX | | | |
|------------------------------|-----------------------------------|---------------------------------|------------------|----------|------------------|---------------------------------|------------------|----------|
| | Construction | | Concrete | Vehicles | Construction | | Concrete | Vehicles |
| | Diesel Equipment | Fugitive Emissions ^a | Batch Plant | | Diesel Equipment | Fugitive Emissions ^a | Batch Plant | |
| Carbon monoxide | 3,900 | 0 | 0 | 49,000 | 778 | 0 | 0 | 37,300 |
| Nitrogen dioxide | 10,100 | 0 | 0 | 13,100 | 2,009 | 0 | 0 | 10,000 |
| PM ₁₀ | 770 ^b | 8,860 ^b | 733 ^b | 44,700 | 154 | 2,830 | 435 ^b | 34,100 |
| Sulfur dioxide | 1,020 | 0 | 0 | 0 | 204 | 0 | 0 | 0 |
| Volatile organic compounds | 800 | 0 | 0 | 6,040 | 160 | 0 | 0 | 4,600 |
| Total suspended particulates | 770 | 16,900 | 733 | 44,700 | 154 | 5,590 | 435 | 34,100 |
| Toxics ^c | 0 | 0 | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998b, 1999a, 1999b.

Maximum air pollutant concentrations from construction activities are summarized in Table G–23.

Table G–23. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of Immobilization and MOX Facilities Collocated in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent | No Action | Immobilization | | Total |
|------------------------------|------------------|------------------------------------|-----------|--------------------|----------|----------|
| | | Standard or Guideline ^a | | (Ceramic or Glass) | MOX | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 1.08 | 0.215 | 35.4 |
| | 1 hour | 40,000 | 48.3 | 7.34 | 1.46 | 57.1 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0838 | 0.0167 | 0.351 |
| PM ₁₀ | Annual | 50 | 0.0179 | 0.0849 | 0.0274 | 0.13 |
| | 24 hours | 150 | 0.77 | 3.85 | 1.32 | 5.94 |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.00846 | 0.00169 | 1.64 |
| | 24 hours | 260 | 8.91 | 0.094 | 0.0188 | 9.02 |
| | 3 hours | 1,300 | 29.6 | 0.64 | 0.128 | 30.4 |
| | [Text deleted.] | | | | | |
| Total suspended particulates | 1 hour | 660 ^b | 32.9 | 1.92 | 0.383 | 35.2 |
| | Annual | 60 | 0.0179 | 0.153 | 0.051 | 0.222 |
| | 24 hours | 150 | 0.77 | 7.05 | 2.4 | 10.2 |
| Toxics ^c | Annual | 0.12 | 0.000006 | 0 | 0.000008 | 0.000014 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.6.2 Operation of Immobilization and MOX Facilities

Potential air quality impacts from operation of the collocated immobilization (ceramic or glass) and MOX and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–24. Stack parameters used for modeling were as stated previously.

Table G–24. Emissions (kg/yr) From Operation of Immobilization and MOX Facilities Collocated in FMEF at Hanford

| Pollutant | Immobilization | | | MOX | | |
|------------------------------|---------------------|--------------------------|----------|---------------------|---------|----------|
| | Emergency Generator | Ceramic or Glass Process | Vehicles | Emergency Generator | Process | Vehicles |
| Carbon monoxide | 1,460 | 0 | 52,700 | 374 | 0 | 34,200 |
| Nitrogen dioxide | 6,790 | 0 | 14,100 | 1,738 | 0 | 9,170 |
| PM ₁₀ | 480 | 0 | 48,100 | 122 | 0 | 31,200 |
| Sulfur dioxide | 450 | 0 | 0 | 114 | 0 | 0 |
| Volatile organic compounds | 550 | 0 | 6,490 | 142 | 0 | 4,210 |
| Total suspended particulates | 480 | 0 | 48,100 | 122 | 0 | 31,200 |
| [Text deleted.] | | | | | | |

[Text deleted.]

Key: FMEF, Fuels and Materials Examination Facility.

Source: UC 1998b, 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources are summarized in Table G–25. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–25. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Immobilization and MOX Facilities Collocated in FMEF at Hanford

| Pollutant | Averaging Period | Most Stringent | No Action | Immobilization | MOX | Total |
|------------------------------|------------------|------------------------------------|-----------|--------------------|----------|-----------------------|
| | | Standard or Guideline ^a | | (Ceramic or Glass) | | With Ceramic or Glass |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.404 | 0.103 | 34.6 |
| | 1 hour | 40,000 | 48.3 | 2.75 | 0.704 | 51.8 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0563 | 0.0144 | 0.321 |
| PM ₁₀ | Annual | 50 | 0.0179 | 0.00398 | 0.00101 | 0.023 |
| | 24 hours | 150 | 0.77 | 0.0443 | 0.0113 | 0.825 |
| Sulfur dioxide | Annual | 50 | 1.63 | 0.00373 | 0.000946 | 1.64 |
| | 24 hours | 260 | 8.91 | 0.0415 | 0.0105 | 8.96 |
| | 3 hours | 1,300 | 29.6 | 0.282 | 0.0715 | 30 |
| | [Text deleted.] | | | | | |
| | 1 hour | 660 ^b | 32.9 | 0.847 | 0.214 | 34 |
| Total suspended particulates | Annual | 60 | 0.0179 | 0.00398 | 0.00101 | 0.0229 |
| | 24 hours | 150 | 0.77 | 0.0443 | 0.0113 | 0.825 |
| [Text deleted.] | | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

[Text deleted.]

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.7 Pit Conversion, Immobilization, and MOX Facilities

G.1.2.7.1 Construction of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from modification of FMEF for pit disassembly and conversion and plutonium conversion and immobilization (ceramic or glass), and new construction of MOX and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–26.

Maximum air pollutant concentrations from construction activities are summarized in Table G–27.

Table G–26. Emissions (kg/yr) From Construction of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

| Pollutant | Pit Conversion | | | Immobilization | | | MOX | | | |
|---------------------|--|--------|------------------|------------------|--|----------------------|------------------|------------------|---------------------------------|-------------|
| | Diesel Equipment & Construction Fugitive | | | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Veh | Diesel Equipment | Construction Concrete | |
| | Emissions | Veh | | | | | | | Fugitive Emissions ^a | Batch Plant |
| CO | 1,000 | 11,300 | 3,060 | 0 | 0 | 40,000 | 3,840 | 0 | 0 | 37,600 |
| NO ₂ | 2,400 | 3,040 | 7,890 | 0 | 0 | 10,700 | 10,080 | 0 | 0 | 10,100 |
| PM ₁₀ | 3,500 | 10,300 | 600 ^b | 6,770 | 560 ^b | 36,500 | 768 ^b | 6,880 | 1,460 ^b | 34,400 |
| SO ₂ | 160 | 0 | 800 | 0 | 0 | 0 | 1,020 | 0 | 0 | 0 |
| VOC | 200 | 1,400 | 620 | 0 | 0 | 4,930 | 792 | 0 | 0 | 4,640 |
| TSP | 9,300 | 10,300 | 600 | 13,100 | 560 | 36,500 | 768 | 13,600 | 1,460 | 34,400 |
| Toxics ^c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as TSP emissions for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Key: CO, carbon monoxide; FMEF, Fuels and Materials Examination Facility; NO₂, nitrogen dioxide; SO₂, sulfur dioxide; TSP, total suspended particulates; Veh, vehicles; VOC, volatile organic compounds.

Source: UC 1998a, 1998b, 1999a, 1999b.

Table G–27. Concentrations (µg/m³) From Construction of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

| Pollutant | Most Stringent | | | Immobilization | | | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|--------------------|----------|----------|
| | Averaging Period | Standard or Guideline ^a | No Action | Pit Conversion | (Ceramic or Glass) | MOX | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.277 | 0.846 | 1.06 | 36.3 |
| | 1 hour | 40,000 | 48.3 | 1.88 | 5.76 | 7.22 | 63.2 |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0199 | 0.0654 | 0.0836 | 0.419 |
| | 24 hours | 50 | 0.0179 | 0.029 | 0.0651 | 0.0744 | 0.186 |
| Sulfur dioxide | Annual | 150 | 0.77 | 0.323 | 2.96 | 3.27 | 7.32 |
| | 24 hours | 50 | 1.63 | 0.00133 | 0.00664 | 0.00846 | 1.65 |
| Total suspended particulates | 24 hours | 260 | 8.91 | 0.0148 | 0.0737 | 0.094 | 9.09 |
| | 3 hours | 1,300 | 29.6 | 0.1 | 0.502 | 0.64 | 30.9 |
| | [Text deleted.] | | | | | | |
| Toxics ^c | 1 hour | 660 ^b | 32.9 | 0.301 | 1.5 | 1.92 | 36.6 |
| | Annual | 60 | 0.0179 | 0.0771 | 0.117 | 0.132 | 0.344 |
| Toxics ^c | 24 hours | 150 | 0.77 | 0.857 | 5.58 | 5.88 | 13.1 |
| | Annual | 0.12 | 0.000006 | 0 | 0 | 0.000008 | 0.000014 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Key: FMEF, Fuels and Materials Examination Facility.

Source: EPA 1997; WDEC 1994.

G.1.2.7.2 Operation of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from operation of the three surplus plutonium disposition and support facilities at Hanford were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–28. Stack parameters used for modeling were as stated previously.

Table G–28. Emissions (kg/yr) From Operation of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

| Pollutant | Pit Conversion | | | Immobilization | | | MOX | | |
|------------------------------|----------------|---------|--------|----------------|----------------------|--------|-------|---------|--------|
| | EG | Process | Veh | EG | Process ^a | Veh | EG | Process | Veh |
| Carbon monoxide | 520 | 0 | 41,800 | 1,460 | 0 | 52,700 | 374 | 0 | 34,200 |
| Nitrogen dioxide | 2,000 | 0 | 11,200 | 6,790 | 0 | 14,100 | 1,738 | 0 | 9,170 |
| PM ₁₀ | 50 | 0 | 38,100 | 480 | 0 | 48,100 | 122 | 0 | 31,200 |
| Sulfur dioxide | 34 | 0 | 0 | 450 | 0 | 0 | 114 | 0 | 0 |
| Volatile organic compounds | 58 | 0 | 5,150 | 550 | 0 | 6,490 | 142 | 0 | 4,210 |
| Total suspended particulates | 50 | 0 | 38,100 | 480 | 0 | 48,100 | 122 | 0 | 31,200 |

[Text deleted.]

^a Ceramic or glass.**Key:** EG, emergency generator; FMEF, Fuels and Materials Examination Facility; Veh, vehicle.**Source:** UC 1998a, 1998b, 1999a, 1999b.

Maximum air pollutant concentrations resulting from the emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–29. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–29. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Pit Conversion and Immobilization Facilities in FMEF and MOX in New Construction at Hanford

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | Pit Conversion | Immobilization (Ceramic or Glass) | | MOX | Total |
|------------------------------|------------------|---|--------|----------------|-----------------------------------|----------|-------|-------|
| | | No Action | | | | | | |
| Carbon monoxide | 8 hours | 10,000 | 34.1 | 0.144 | 0.404 | 0.103 | 34.7 | |
| | 1 hour | 40,000 | 48.3 | 0.978 | 2.75 | 0.704 | 52.7 | |
| Nitrogen dioxide | Annual | 100 | 0.25 | 0.0166 | 0.0563 | 0.0144 | 0.337 | |
| | 24 hours | 50 | 0.0179 | 0.000415 | 0.00398 | 0.00101 | 0.023 | |
| PM ₁₀ | Annual | 150 | 0.77 | 0.00461 | 0.0442 | 0.0113 | 0.83 | |
| | 24 hours | 50 | 1.63 | 0.000282 | 0.00373 | 0.000946 | 1.64 | |
| Sulfur dioxide | 24 hours | 260 | 8.91 | 0.00313 | 0.0415 | 0.0105 | 8.97 | |
| | 3 hours | 1,300 | 29.6 | 0.0213 | 0.282 | 0.0715 | 30 | |
| | [Text deleted.] | | | | | | | |
| Total suspended particulates | 1 hour | 660 ^b | 32.9 | 0.064 | 0.847 | 0.214 | 34 | |
| | Annual | 60 | 0.0179 | 0.000415 | 0.00398 | 0.00101 | 0.023 | |
| Total suspended particulates | 24 hours | 150 | 0.77 | 0.00461 | 0.0443 | 0.0113 | 0.83 | |

[Text deleted.]

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.^b At Hanford, the level is not to be exceeded more than twice in any 7 consecutive days.

[Text deleted.]

Key: FMEF, Fuels and Materials Examination Facility.**Source:** EPA 1997; WDEC 1994.

G.2 INEEL

G.2.1 Assessment Data

Emission rates for criteria, hazardous, and toxic pollutants at INEEL are presented in Table F.1.2.4–1 of the *Storage and Disposition PEIS* (DOE 1996a:F-10). These emission rates were used as input into the modeled No Action pollutant concentrations presented in that document and reflect INEEL facility emissions for 1990, which were assumed to be representative of No Action for 2005. The storage alternative selected for INEEL results in no change in these concentrations (DOE 1996a:4-138). Other onsite activities related to programs analyzed in EISs for spent nuclear fuel and waste management are also included in the estimates of the No Action concentration for surplus plutonium disposition shown in Table G–30. For the cumulative impacts analysis, additional emissions from the proposed Advanced Mixed Waste Treatment Project are also considered. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–30. Estimated Concentrations ($\mu\text{g}/\text{m}^3$) From No Action at INEEL

| Pollutant | Averaging Period | PEIS Estimated Base Year (2005) | Other Onsite From PEIS | No Action | AMWTP ^a |
|------------------|------------------|---------------------------------|------------------------|-----------|--------------------|
| Carbon monoxide | 8 hours | 284 | 18 | 302 | 0.85 |
| | 1 hour | 614 | 605 | 1,219 | 115 |
| Nitrogen dioxide | Annual | 4 | 7 | 11 | 0.34 |
| PM ₁₀ | Annual | 3 | 0 | 3 | 0.006 |
| | 24 hours | 33 | 6 | 39 | 4.6 |
| Sulfur dioxide | Annual | 6 | 0 | 6 | 0.012 |
| | 24 hours | 135 | 2 | 137 | 4.5 |
| | 3 hours | 579 | 12 | 591 | 25 |
| Benzene | Annual | 0.029 | 0 | 0.029 | 0.0001 |
| [Text deleted.] | | | | | |

^a Contribution from the Advanced Mixed Waste Treatment Project proposed action with microencapsulation or vitrification (included in cumulative impacts analysis).

Key: AMWTP, *INEEL Advanced Mixed Waste Treatment Project Final EIS*; PEIS, *Storage and Disposition PEIS*.

Source: DOE 1996a:4-138, 4-928, 4-929; DOE 1999.

G.2.2 Facilities

G.2.2.1 Pit Conversion Facility

G.2.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from modification of the Fuel Processing Facility (FPF) and construction of new support facilities at INEEL for pit disassembly and conversion were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–31.

Maximum air pollutant concentrations from construction activities are summarized in Table G–32 but are not expected to result in the exceedance of the ambient air quality standards.

Table G–31. Emissions (kg/yr) From Construction of Pit Conversion Facility in FPF at INEEL

| Pollutant | Diesel Equipment and Construction Fugitive | |
|----------------------------|--|----------|
| | Emissions | Vehicles |
| Carbon monoxide | 1,300 | 44,100 |
| Nitrogen dioxide | 5,600 | 11,100 |
| PM ₁₀ | 3,900 | 33,300 |
| Sulfur dioxide | 370 | 0 |
| Volatile organic compounds | 460 | 5,390 |

Key: FPF, Fuel Processing Facility.

Source: UC 1998c.

Table G–32. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of Pit Conversion Facility in FPF at INEEL

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------|------------------|------------------------------------|-----------|--------------|-------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 302 | 0.524 | 303 |
| | 1 hour | 40,000 | 1,219 | 1.42 | 1,220 |
| Nitrogen dioxide | Annual | 100 | 11 | 0.0658 | 11.1 |
| | 24 hours | 150 | 39 | 0.585 | 39.6 |
| Sulfur dioxide | Annual | 80 | 6 | 0.00434 | 6 |
| | 24 hours | 365 | 137 | 0.0555 | 137 |
| | 3 hours | 1,300 | 591 | 0.223 | 591 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

Key: FPF, Fuel Processing Facility.

Source: EPA 1997; ID DHW 1995.

G.2.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the pit conversion and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–33. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35 m (115 ft) height, 1.82 m (6.0 ft) diameter, stack exit temperature of 11 °C (52 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 45.7 m (150 ft) height, 1.85 m (6.1 ft) diameter, stack exit temperature of 174 °C (345 °F), and an exit velocity of 3.25 m/s (10.7 ft/s) (UC 1998c).

Table G–33. Emissions (kg/yr) From Operation of Pit Conversion Facility in FPF at INEEL

| Pollutant | Emergency | | | |
|----------------------------|-----------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 580 | 520 | 0 | 74,100 |
| Nitrogen dioxide | 18,000 | 2,000 | 0 | 18,600 |
| PM ₁₀ | 1,250 | 50 | 0 | 56,000 |
| Sulfur dioxide | 30,000 | 34 | 0 | 0 |
| Volatile organic compounds | 62 | 58 | 0 | 9,050 |

Key: FPF, Fuel Processing Facility.

Source: UC 1998c.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–34.

Table G–34. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Pit Conversion Facility in FPF at INEEL

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | | |
|------------------|------------------|---|--------------|---------|-------|
| | | No Action | Contribution | Total | |
| Carbon monoxide | 8 hours | 10,000 | 302 | 0.253 | 302 |
| | 1 hour | 40,000 | 1,219 | 0.80 | 1,220 |
| Nitrogen dioxide | Annual | 100 | 11 | 0.0838 | 11.1 |
| | 24 hours | 50 | 3 | 0.00477 | 3.00 |
| PM ₁₀ | Annual | 150 | 39 | 0.0494 | 39.1 |
| | 24 hours | 80 | 6 | 0.101 | 6.10 |
| Sulfur dioxide | Annual | 365 | 137 | 1.01 | 138 |
| | 3 hours | 1,300 | 591 | 5.42 | 596 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

Key: FPF, Fuel Processing Facility.

Source: EPA 1997; ID DHW 1995.

At the nearest prevention of significant deterioration (PSD) Class I area, Craters of the Moon National Monument, the contribution to air pollutant concentrations is less than $0.01 \mu\text{g}/\text{m}^3$ for nitrogen dioxide, particulate matter with an aerodynamic diameter less than or equal to $10 \mu\text{m}$ (PM₁₀), and sulfur dioxide, except for the 24-hr sulfur dioxide value, which is $0.05 \mu\text{g}/\text{m}^3$, and the 3-hr sulfur dioxide value, which is $0.23 \mu\text{g}/\text{m}^3$. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

G.2.2.2 MOX Facility

G.2.2.2.1 Construction of MOX Facility

Potential air quality impacts from construction of new MOX and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–35.

Table G–35. Emissions (kg/yr) From Construction of New MOX Facility at INEEL

| Pollutant | Construction | | | Vehicles |
|----------------------------|------------------|---------------------------------|----------------------|----------|
| | Diesel Equipment | Fugitive Emissions ^a | Concrete Batch Plant | |
| Carbon monoxide | 3,840 | 0 | 0 | 114,000 |
| Nitrogen dioxide | 10,080 | 0 | 0 | 28,600 |
| PM ₁₀ | 768 | 6,860 | 1,460 | 85,900 |
| Sulfur dioxide | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 792 | 0 | 0 | 13,900 |
| Toxics ^b | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Source: UC 1998d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–36.

Table G–36. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of New MOX Facility at INEEL

| Pollutant | Averaging Period | Most Stringent | No Action | Contribution | Total |
|---------------------|------------------|------------------------------------|-----------|--------------|-------|
| | | Standard or Guideline ^a | | | |
| Carbon monoxide | 8 hours | 10,000 | 302 | 1.54 | 304 |
| | 1 hour | 40,000 | 1,219 | 4.18 | 1,220 |
| Nitrogen dioxide | Annual | 100 | 11 | 0.118 | 11.1 |
| | 24 hours | 50 | 3 | 0.105 | 3.11 |
| PM ₁₀ | Annual | 150 | 39 | 5.32 | 44.3 |
| | 24 hours | 80 | 6 | 0.012 | 6.01 |
| Sulfur dioxide | Annual | 365 | 137 | 0.153 | 137 |
| | 24 hours | 1,300 | 591 | 0.614 | 592 |
| Toxics ^b | Annual | 0.12 | 0.029 | 0.00001 | 0.029 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Source: EPA 1997; ID DHW 1995.

G.2.2.2.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–37. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 8 m (26 ft) height, 0.3048 m (1.0 ft) diameter, stack exit temperature of 11 °C (52 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 45.7 m (150 ft) height, 1.85 m (6.1 ft) diameter, stack exit temperature of 174 °C (345 °F), and exit velocity of 3.25 m/s (10.7 ft/s) (UC 1998d).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–38.

Table G-37. Emissions (kg/yr) From Operation of New MOX Facility at INEEL

| Pollutant | Emergency | | | |
|----------------------------|-----------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 4,800 | 374 | 0 | 77,600 |
| Nitrogen dioxide | 12,000 | 1,738 | 0 | 19,500 |
| PM ₁₀ | 636 | 122 | 0 | 58,600 |
| Sulfur dioxide | 72,600 | 114 | 0 | 0 |
| Volatile organic compounds | 0 | 142 | 0 | 9,470 |
| [Text deleted.] | | | | |
| [Text deleted.] | | | | |

Source: UC 1998d.

Table G-38. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New MOX Facility at INEEL

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------|------------------|------------------------------------|-----------|--------------|-------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 302 | 0.509 | 303 |
| | 1 hour | 40,000 | 1,219 | 2.34 | 1,220 |
| Nitrogen dioxide | Annual | 100 | 11 | 0.0606 | 11.1 |
| | 24 hours | 50 | 3 | 0.00356 | 3. |
| PM ₁₀ | Annual | 150 | 39 | 0.0396 | 39. |
| | 24 hours | 80 | 6 | 0.244 | 6.24 |
| Sulfur dioxide | Annual | 365 | 137 | 2.45 | 139 |
| | 24 hours | 1,300 | 591 | 13.2 | 604 |
| [Text deleted.] | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Source: EPA 1997; ID DHW 1995.

At the nearest PSD Class I area, Craters of the Moon National Monument, the contribution to air pollutant concentrations is less than $0.01 \mu\text{g}/\text{m}^3$ for nitrogen dioxide and PM₁₀. For sulfur dioxide the annual value is $0.01 \mu\text{g}/\text{m}^3$, the 24-hr value is $0.11 \mu\text{g}/\text{m}^3$, and the 3-hr value is $0.46 \mu\text{g}/\text{m}^3$. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

G.2.2.3 Pit Conversion and MOX Facilities

G.2.2.3.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from modification of FPF for pit disassembly and conversion and construction of new MOX and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G-39.

Table G–39. Emissions (kg/yr) From Construction of Pit Conversion Facility in FPF and New MOX Facility at INEEL

| Pollutant | Pit Conversion | | MOX | | | |
|----------------------------|--|----------|------------------|--|----------------------|----------|
| | Diesel Equipment and Construction Fugitive Emissions | Vehicles | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 1,300 | 44,100 | 3,840 | 0 | 0 | 114,000 |
| Nitrogen dioxide | 5,600 | 11,100 | 10,080 | 0 | 0 | 28,600 |
| PM ₁₀ | 3,900 | 33,300 | 768 | 6,860 | 1,460 | 85,900 |
| Sulfur dioxide | 370 | 0 | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 460 | 5,390 | 792 | 0 | 0 | 13,900 |
| Toxics ^b | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Key: FPF, Fuel Processing Facility.

Source: UC 1998c, 1998d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–40.

Table G–40. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of Pit Conversion Facility in FPF and New MOX Facility at INEEL

| Pollutant | Averaging Period | Most Stringent | | Pit Conversion | MOX | Total |
|---------------------|------------------|------------------------------------|-----------|----------------|---------|-------|
| | | Standard or Guideline ^a | No Action | | | |
| Carbon monoxide | 8 hours | 10,000 | 302 | 0.524 | 1.55 | 304 |
| | 1 hour | 40,000 | 1,219 | 1.42 | 4.18 | 1,220 |
| Nitrogen dioxide | Annual | 100 | 11 | 0.0658 | 0.118 | 11.2 |
| | 24 hours | 50 | 3 | 0.0458 | 0.105 | 3.15 |
| PM ₁₀ | Annual | 150 | 39 | 0.585 | 5.32 | 44.9 |
| | 24 hours | 80 | 6 | 0.00434 | 0.012 | 6.02 |
| Sulfur dioxide | Annual | 365 | 137 | 0.0555 | 0.153 | 137 |
| | 3 hours | 1,300 | 591 | 0.223 | 0.614 | 592 |
| Toxics ^b | Annual | 0.12 | 0.029 | 0 | 0.00001 | 0.029 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Key: FPF, Fuel Processing Facility.

Source: EPA 1997; ID DHW 1995.

G.2.2.3.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of the new pit conversion, MOX, and support facilities at INEEL were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from boilers, emissions from emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–41. Stack parameters used for modeling were as stated previously.

Table G–41. Emissions (kg/yr) From Operation of Pit Conversion Facility in FPF and New MOX Facility at INEEL

| Pollutant | Pit Conversion | | | | MOX | | | |
|----------------------------|----------------|-----------|---------|----------|---------|-----------|---------|----------|
| | Boilers | Emergency | | | Boilers | Emergency | | |
| | | Generator | Process | Vehicles | | Generator | Process | Vehicles |
| Carbon monoxide | 580 | 520 | 0 | 74,100 | 4,800 | 374 | 0 | 77,600 |
| Nitrogen dioxide | 18,000 | 2,000 | 0 | 18,600 | 12,000 | 1,738 | 0 | 19,500 |
| PM ₁₀ | 1,250 | 50 | 0 | 56,000 | 636 | 122 | 0 | 58,600 |
| Sulfur dioxide | 30,000 | 34 | 0 | 0 | 72,600 | 114 | 0 | 0 |
| Volatile organic compounds | 62 | 58 | 0 | 9,050 | 0 | 142 | 0 | 9,470 |
| [Text deleted.] | | | | | | | | |

[Text deleted.]

Key: FPF, Fuel Processing Facility.
Source: UC 1998c, 1998d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–42.

Table G–42. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of Pit Conversion Facility in FPF and New MOX Facility at INEEL

| Pollutant | Most Stringent | | | Pit Conversion ^a | MOX | Total |
|------------------|------------------|------------------------------------|-----------|-----------------------------|---------|-------|
| | Averaging Period | Standard or Guideline ^a | No Action | | | |
| Carbon monoxide | 8 hours | 10,000 | 302 | 0.253 | 0.509 | 303 |
| | 1 hour | 40,000 | 1,219 | 0.80 | 2.34 | 1,220 |
| Nitrogen dioxide | Annual | 100 | 11 | 0.0838 | 0.0606 | 11.1 |
| | 24 hours | 50 | 3 | 0.00477 | 0.00356 | 3.01 |
| Sulfur dioxide | Annual | 150 | 39 | 0.0494 | 0.0396 | 39.1 |
| | 24 hours | 80 | 6 | 0.101 | 0.244 | 6.35 |
| | 3 hours | 365 | 137 | 1.01 | 2.45 | 140 |
| | | 1,300 | 591 | 5.42 | 13.2 | 610 |
| [Text deleted.] | | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Key: FPF, Fuel Processing Facility.
Source: EPA 1997; ID DHW 1995.

At the nearest PSD Class I area, Craters of the Moon National Monument, the contribution to air pollutant concentrations are $0.01 \mu\text{g}/\text{m}^3$ or less for nitrogen dioxide and PM₁₀. For sulfur dioxide the annual value is $0.01 \mu\text{g}/\text{m}^3$, the 24-hr value is $0.16 \mu\text{g}/\text{m}^3$, and the 3-hr value is $0.69 \mu\text{g}/\text{m}^3$. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

G.3 PANTEX

G.3.1 Assessment Data

Emission rates for criteria, hazardous, and toxic air pollutants at Pantex are presented in Table 4.7.2.1–3 of the *Final Environmental Impact Statement for the Continued Operation of Pantex* (DOE 1996c:4-147). These emission rates were used as input into the modeled pollutant concentrations presented in that document and reflect Pantex facility emissions for over a 10-year period to about 2006. These concentrations are assumed to be representative of No Action for 2005 and include the upgrade storage alternative selected for Pantex and discussed in the *Storage and Disposition PEIS* (DOE 1996a:4-190). Other onsite activities related to programs analyzed in EISs for stockpile stewardship management and waste management are added to these concentrations as shown in Table G–43. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–43. Estimated Concentrations ($\mu\text{g}/\text{m}^3$) From No Action at Pantex

| Pollutant | Averaging Period | PEIS | Other Onsite | |
|------------------------------|------------------|------------------------|--------------|-----------|
| | | No Action ^a | From PEIS | No Action |
| Carbon monoxide | 8 hours | 602 | 17.5 | 620 |
| | 1 hour | 2,900 | 92.8 | 2,990 |
| Nitrogen dioxide | Annual | 0.542 | 1.4 | 1.94 |
| PM ₁₀ | Annual | 8.73 | 0.06 | 8.79 |
| | 24 hours | 88.5 | 0.93 | 89.4 |
| Sulfur dioxide | Annual | 0 | 0 | 0 |
| | 24 hours | 0.00002 | 0 | 0.00002 |
| | 3 hours | 0.00008 | 0 | 0.00008 |
| | 30 minutes | 0.00016 | 0 | 0.00016 |
| Total suspended particulates | 3 hours | (a) | (a) | (a) |
| | 1 hour | (a) | (a) | (a) |
| Benzene | Annual | 0.0547 | 0 | 0.0547 |
| | 1 hour | 19.4 | 0 | 19.4 |

[Text deleted.]

^a Three- and 1-hr concentrations for total suspended particulates were not reported in the source document.

[Text deleted.]

Key: PEIS, *Storage and Disposition PEIS*.

Source: DOE 1996a:4-936, 4-937; 1996c:4-139.

G.3.2 Facilities

G.3.2.1 Pit Conversion Facility

G.3.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from construction of new pit conversion and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–44.

Maximum air pollutant concentrations from construction activities are summarized in Table G–45.

Table G–44. Emissions (kg/yr) From Construction of New Pit Conversion Facility at Pantex

| Pollutant | Diesel Equipment and Construction Fugitive | |
|------------------------------|--|----------|
| | Emissions | Vehicles |
| Carbon monoxide | 6,400 | 40,500 |
| Nitrogen dioxide | 29,200 | 11,200 |
| PM ₁₀ | 20,300 | 38,900 |
| Sulfur dioxide | 1,900 | 0 |
| Volatile organic compounds | 2,400 | 5,140 |
| Total suspended particulates | 47,500 | 38,900 |

Source: UC 1998e.

Table G–45. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of New Pit Conversion Facility at Pantex

| Pollutant | Averaging Period | Most Stringent | No Action | Contribution | Total |
|------------------------------|------------------|------------------------------------|-----------|--------------|--------|
| | | Standard or Guideline ^a | | | |
| Carbon monoxide | 8 hours | 10,000 | 620 | 3.77 | 623 |
| | 1 hour | 40,000 | 2,990 | 23.5 | 3,020 |
| Nitrogen dioxide | Annual | 100 | 1.94 | 0.501 | 2.44 |
| | PM ₁₀ | 50 | 8.79 | 0.349 | 9.14 |
| Sulfur dioxide | 24 hours | 150 | 89.4 | 4.18 | 93.6 |
| | Annual | 80 | 0 | 0.0326 | 0.0326 |
| Total suspended particulates | 24 hours | 365 | 0.00002 | 0.392 | 0.392 |
| | 3 hours | 1,300 | 0.00008 | 1.71 | 1.71 |
| | 30 minutes | 1,048 | 0.00016 | 6.98 | 6.98 |
| Total suspended particulates | 3 hours | 200 | (b) | 42.7 | 42.7 |
| | 1 hour | 400 | (b) | 174 | 174 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.

Source: EPA 1997; TNRC 1997a, 1997b.

G.3.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the new pit conversion and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–46. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35 m (115 ft) height, 1.82 m (6.0 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 19.8 m (65 ft) height, 1.7 m (5.6 ft) diameter, stack exit temperature of 124 °C (255 °F), and an exit velocity of 6.2 m/s (20 ft/s) (UC 1998e).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–47. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-46. Emissions (kg/yr) From Operation of New Pit Conversion Facility at Pantex

| Pollutant | Emergency | | | |
|------------------------------|-----------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 780 | 520 | 0 | 38,800 |
| Nitrogen dioxide | 700 | 2,000 | 0 | 10,800 |
| PM ₁₀ | 300 | 50 | 0 | 37,300 |
| Sulfur dioxide | 13 | 34 | 0 | 0 |
| Volatile organic compounds | 132 | 58 | 0 | 4,920 |
| Total suspended particulates | 300 | 50 | 0 | 37,300 |

Source: UC 1998e.

Table G-47. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Pit Conversion Facility at Pantex

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|------------------|------------------------------------|-----------|--------------|---------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 620 | 0.381 | 620 |
| | 1 hour | 40,000 | 2,990 | 2.14 | 2,990 |
| Nitrogen dioxide | Annual | 100 | 1.94 | 0.0374 | 1.98 |
| | 24 hours | 50 | 8.79 | 0.00215 | 8.79 |
| Sulfur dioxide | Annual | 150 | 89.4 | 0.0225 | 89.5 |
| | 24 hours | 80 | 0 | 0.00064 | 0.00064 |
| Total suspended particulates | 24 hours | 365 | 0.00002 | 0.00753 | 0.00755 |
| | 3 hours | 1,300 | 0.00008 | 0.0327 | 0.0328 |
| | 30 minutes | 1,048 | 0.00016 | 0.129 | 0.129 |
| Total suspended particulates | 3 hours | 200 | (b) | 0.0937 | 0.0937 |
| | 1 hour | 400 | (b) | 0.273 | 0.273 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.

Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.2 MOX Facility

G.3.2.2.1 Construction of MOX Facility

Potential air quality impacts from construction of new MOX and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-48.

Maximum air pollutant concentrations from construction activities are summarized in Table G-49.

Table G-48. Emissions (kg/yr) From Construction of New MOX Facility at Pantex

| Pollutant | Construction | | | |
|------------------------------|------------------|---------------------------------|----------------------|----------|
| | Diesel Equipment | Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 3,840 | 0 | 0 | 35,800 |
| Nitrogen dioxide | 10,080 | 0 | 0 | 9,930 |
| PM ₁₀ | 768 ^b | 6,890 | 1,460 ^b | 34,400 |
| Sulfur dioxide | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 792 | 0 | 0 | 4,540 |
| Total suspended particulates | 768 | 13,700 | 1,460 | 34,400 |
| Toxics ^c | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Source: UC 1998f.

Table G-49. Concentrations (μg/m³) From Construction of New MOX Facility at Pantex

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|------------------|------------------------------------|-----------|--------------|--------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 620 | 2.26 | 622 |
| | 1 hour | 40,000 | 2,990 | 14.1 | 3,010 |
| Nitrogen dioxide | Annual | 100 | 1.94 | 0.173 | 2.12 |
| | PM ₁₀ | 50 | 8.79 | 0.154 | 8.94 |
| Sulfur dioxide | 24 hours | 150 | 89.4 | 7.31 | 96.7 |
| | Annual | 80 | 0 | 0.0175 | 0.018 |
| | 24 hours | 365 | 0.00002 | 0.21 | 0.21 |
| | 3 hours | 1,300 | 0.00008 | 0.917 | 0.918 |
| Total suspended particulates | 30 minutes | 1,048 | 0.00016 | 3.75 | 3.75 |
| | 3 hours | 200 | (b) | 57.4 | 57.4 |
| | 1 hour | 400 | (b) | 234 | 234 |
| Toxics ^c | Annual | 3 ^d | 0.0547 | 0.00002 | 0.0547 |
| | 1 hour | 75 ^d | 19.4 | 0.0162 | 19.4 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

^d Effects-screening level of the Texas Natural Resource Conservation Commission. Such levels are not ambient air standards, but merely "tools" used by the Toxicology and Risk Assessment staff to evaluate impacts of air pollutant emissions. Thus, exceedance of the screening levels by ambient air contaminants does not necessarily indicate a problem. That circumstance, however, would prompt a more thorough evaluation.

[Text deleted.]

Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.2.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-50. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 8 m (26 ft) height, 0.3048 m

Table G–50. Emissions (kg/yr) From Operation of New MOX Facility at Pantex

| Pollutant | Emergency | | | |
|------------------------------|-----------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 1,080 | 374 | 0 | 34,800 |
| Nitrogen dioxide | 1,470 | 1,738 | 0 | 9,660 |
| PM ₁₀ | 247 | 122 | 0 | 33,400 |
| Sulfur dioxide | 11 | 114 | 0 | 0 |
| Volatile organic compounds | 102 | 142 | 0 | 4,410 |
| Total suspended particulates | 247 | 122 | 0 | 33,400 |
| [Text deleted.] | | | | |

Source: UC 1998f.

(1.0 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 19.8 m (65 ft) height, 1.7 m (5.6 ft) diameter, stack exit temperature of 124 °C (255 °F), and an exit velocity of 6.2 m/s (20 ft/s) (UC 1998f).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators and process sources, plus the No Action concentrations, are summarized in Table G–51. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–51. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New MOX Facility at Pantex

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|------------------|------------------------------------|-----------|--------------|--------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 620 | 0.324 | 620 |
| | 1 hour | 40,000 | 2,990 | 1.70 | 2,990 |
| Nitrogen dioxide | Annual | 100 | 1.94 | 0.0362 | 1.98 |
| | Annual | 50 | 8.79 | 0.00316 | 8.79 |
| PM ₁₀ | 24 hours | 150 | 89.4 | 0.0352 | 89.5 |
| | Annual | 80 | 0 | 0.00201 | 0.002 |
| Sulfur dioxide | 24 hours | 365 | 0.00002 | 0.0239 | 0.0239 |
| | 3 hours | 1,300 | 0.00008 | 0.104 | 0.104 |
| | 30 minutes | 1,048 | 0.00016 | 0.422 | 0.422 |
| | Annual | 80 | 0 | 0.00201 | 0.002 |
| Total suspended particulates | 3 hours | 200 | (b) | 0.15 | 0.15 |
| | 1 hour | 400 | (b) | 0.522 | 0.522 |
| [Text deleted.] | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.

[Text deleted.]

Source: EPA 1997; TNRCC 1997a, 1997b.

G.3.2.3 Pit Conversion and MOX Facilities

G.3.2.3.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from construction of new pit conversion, MOX, and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction

equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-52.

Table G-52. Emissions (kg/yr) From Construction of New Pit Conversion and MOX Facilities at Pantex

| Pollutant | Pit Conversion | | MOX | | | |
|------------------------------|--|----------|------------------|--|----------------------|----------|
| | Diesel Equipment and Construction Fugitive Emissions | Vehicles | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 6,400 | 40,500 | 3,840 | 0 | 0 | 35,800 |
| Nitrogen dioxide | 29,200 | 11,200 | 10,080 | 0 | 0 | 9,930 |
| PM ₁₀ | 20,300 | 38,900 | 768 ^b | 6,890 | 1,460 ^b | 34,400 |
| Sulfur dioxide | 1,900 | 0 | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 2,400 | 5,140 | 792 | 0 | 0 | 4,540 |
| Total suspended particulates | 47,500 | 38,900 | 768 | 13,700 | 1,460 | 34,400 |
| Toxics ^c | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for MOX for the purpose of this analysis resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Source: UC 1998e, 1998f.

Maximum air pollutant concentrations from construction activities are summarized in Table G-53.

Table G-53. Concentrations (μm^3) From Construction of New Pit Conversion and MOX Facilities at Pantex

| Pollutant | Averaging Period | Most Stringent | | Pit Conversion | MOX | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|---------|--------|
| | | Standard or Guideline ^a | No Action | | | |
| Carbon monoxide | 8 hours | 10,000 | 620 | 3.77 | 2.26 | 626 |
| | 1 hour | 40,000 | 2,990 | 23.5 | 14.1 | 3,030 |
| Nitrogen dioxide | Annual | 100 | 1.94 | 0.501 | 0.173 | 2.62 |
| | PM ₁₀ | 50 | 8.79 | 0.349 | 0.154 | 9.29 |
| Sulfur dioxide | 24 hours | 150 | 89.4 | 4.18 | 7.31 | 100 |
| | Annual | 80 | 0 | 0.0326 | 0.0175 | 0.0501 |
| | 24 hours | 365 | 0.00002 | 0.392 | 0.21 | 0.602 |
| | 3 hours | 1,300 | 0.00008 | 1.71 | 0.917 | 2.63 |
| Total suspended particulates | 30 minutes | 1,048 | 0.00016 | 6.98 | 3.75 | 10.7 |
| | 3 hours | 200 | (b) | 42.7 | 57.4 | 100 |
| | 1 hour | 400 | (b) | 174 | 234 | 409 |
| Toxics ^c | Annual | 3 | 0.0547 | 0.00 | 0.00002 | 0.0547 |
| | 1 hour | 75 | 19.4 | 0.00 | 0.0162 | 19.4 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

[Text deleted.]

Source: EPA 1997; TNRC 1997a, 1997b.

G.3.2.3.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of the new pit conversion, MOX, and support facilities at Pantex were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-54. Stack parameters used for modeling were as stated previously.

Table G-54. Emissions (kg/yr) From Operation of New Pit Conversion and MOX Facilities at Pantex

| Pollutant | Pit Conversion | | | | MOX | | | |
|------------------------------|----------------|-----------|---------|----------|---------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 780 | 520 | 0 | 38,800 | 1,080 | 374 | 0 | 34,800 |
| Nitrogen dioxide | 700 | 2,000 | 0 | 10,800 | 1,470 | 1,738 | 0 | 9,660 |
| PM ₁₀ | 300 | 50 | 0 | 37,300 | 247 | 122 | 0 | 33,400 |
| Sulfur dioxide | 13 | 34 | 0 | 0 | 11 | 114 | 0 | 0 |
| Volatile organic compounds | 132 | 58 | 0 | 4,920 | 102 | 142 | 0 | 4,410 |
| Total suspended particulates | 300 | 50 | 0 | 37,300 | 247 | 122 | 0 | 33,400 |

[Text deleted.]

[Text deleted.]

Source: UC 1998e, 1998f.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G-55. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-55. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Pit Conversion and MOX Facilities at Pantex

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | No Action | Pit Conversion | | MOX | Total |
|------------------------------|------------------|---|--|-----------|----------------|---------|-----|---------|
| | | | | | | | | |
| Carbon monoxide | 8 hours | 10,000 | | 620 | 0.381 | 0.324 | | 620 |
| | 1 hour | 40,000 | | 2,990 | 2.14 | 1.7 | | 3,000 |
| Nitrogen dioxide | Annual | 100 | | 1.94 | 0.0374 | 0.0362 | | 2.02 |
| | 24 hours | 150 | | 89.4 | 0.0225 | 0.0352 | | 89.5 |
| Sulfur dioxide | Annual | 80 | | 0 | 0.00064 | 0.00201 | | 0.00265 |
| | 24 hours | 365 | | 0.00002 | 0.00753 | 0.0239 | | 0.0315 |
| Total suspended particulates | 3 hours | 200 | | (b) | 0.0937 | 0.15 | | 0.244 |
| | 1 hour | 400 | | (b) | 0.273 | 0.522 | | 0.796 |

[Text deleted.]

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Three- and 1-hr concentrations for total suspended particulates were not listed in the source document.

[Text deleted.]

Source: EPA 1997; TNRC 1997a, 1997b.

G.4 SRS

G.4.1 Assessment Data

Emission rates for 1994 for criteria, hazardous, and toxic air pollutants at SRS were used as input into the modeling of pollutant concentrations presented in the *Savannah River Site Spent Nuclear Fuel Management Draft Environmental Impact Statement* (DOE 1998a:3-26). Presented in Table G-56 are concentration estimates assumed to be representative of the No Action Alternative at SRS for 2005. These estimates take into account the storage upgrade to accommodate nonpit material from the Rocky Flats Environmental Technology Site (DOE 1996a:4-299), as well as other onsite activities responsive to EIS Records of Decision in various program areas, specifically, foreign research reactor spent nuclear fuel, highly enriched uranium disposition, interim management of nuclear materials, stockpile stewardship and management, tritium supply and recycling, and waste management (DOE 1996a:4-953, 4-954). Other activities at SRS, which may occur during the time period 2005–2015, including operation of the Tritium Extraction Facility and spent nuclear fuel processing, are discussed in the cumulative impacts section. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-56. Estimated Concentrations ($\mu\text{g}/\text{m}^3$) From No Action at SRS

| Pollutant | Averaging Period | 1994 Baseline Concentration ^a | Other Onsite Sources | | | |
|------------------------------|------------------|--|----------------------|-------|---------|------|
| | | | No Action | TEF | SNF | |
| Carbon monoxide | 8 hours | 632 | 39.1 | 671 | 0.45 | 1.3 |
| | 1 hour | 5,010 | 82.2 | 5,100 | 3.6 | 9.8 |
| Nitrogen dioxide | Annual | 8.8 | 2.57 | 11.4 | 0.0055 | 3.4 |
| PM ₁₀ | Annual | 4.8 | 0.14 | 4.94 | 0.00009 | 0.02 |
| | 24 hours | 80.6 | 5.13 | 85.7 | 0.01 | 0.13 |
| Sulfur dioxide | Annual | 16.3 | 0.39 | 16.7 | 0.00009 | 0.02 |
| | 24 hours | 215 | 6.96 | 222 | 0.001 | 0.13 |
| | 3 hours | 690 | 34.9 | 725 | 0.088 | 0.98 |
| Total suspended particulates | Annual | 43.3 | 2.08 | 45.4 | 0.00016 | 0.02 |
| Benzene | 24 hours | 20.7 | 0 | 20.7 | 0 | 0 |
| [Text deleted.] | | | | | | |

^a DOE 1998a:3-26.

Key: SNF, SRS Spent Nuclear Fuel Management Draft EIS; TEF, Construction and Operation of a Tritium Extraction Facility at SRS Draft EIS.

Source: DOE 1995a:E-10–E-13; 1995b:5-3; 1995c: vol. 1, app. C, 5-9; 1995d:4-408; 1996a:4-299; 1996d:4-26; 1998a:5-4; 1998b:4-6.

G.4.2 Facilities

G.4.2.1 Pit Conversion Facility

G.4.2.1.1 Construction of Pit Conversion Facility

Potential air quality impacts from construction of new pit conversion and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G-57.

Table G-57. Emissions (kg/yr) From Construction of New Pit Conversion Facility at SRS

| Pollutant | Diesel Equipment and Construction Fugitive | |
|------------------------------|--|----------|
| | Emissions | Vehicles |
| Carbon monoxide | 6,400 | 38,600 |
| Nitrogen dioxide | 29,200 | 11,200 |
| PM ₁₀ | 20,300 | 39,500 |
| Sulfur dioxide | 1,900 | 0 |
| Volatile organic compounds | 2,400 | 5,160 |
| Total suspended particulates | 47,500 | 39,500 |

Source: UC 1998g.

Maximum air pollutant concentrations from construction activities are summarized in Table G-58.

Table G-58. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of New Pit Conversion Facility at SRS

| Pollutant | Averaging Period | Most Stringent Standard or Guideline ^a | | | |
|------------------------------|------------------|---|--------------|---------|-------|
| | | No Action | Contribution | Total | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.911 | 672 |
| | 1 hour | 40,000 | 5,100 | 4.14 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0601 | 11.4 |
| | PM ₁₀ | 50 | 4.94 | 0.0418 | 4.98 |
| Sulfur dioxide | 24 hours | 150 | 85.7 | 1.03 | 86.8 |
| | Annual | 80 | 16.7 | 0.00391 | 16.7 |
| | 24 hours | 365 | 222 | 0.0964 | 222 |
| Total suspended particulates | 3 hours | 1,300 | 725 | 0.578 | 726 |
| | Annual | 75 | 45.4 | 0.0977 | 45.5 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

Source: EPA 1997; SCDHEC 1996.

G.4.2.1.2 Operation of Pit Conversion Facility

Potential air quality impacts from operation of the new pit conversion and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-59. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 35 m (115 ft) height, 1.82 m (6 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 38.1 m (125 ft) height, 3.01 m (9.9 ft) diameter, stack exit temperature of 160 °C (320 °F), and an exit velocity of 10.67 m/s (35 ft/s) (UC 1998g).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G-60. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

**Table G–59. Emissions (kg/yr) From Operation of
New Pit Conversion Facility at SRS**

| Pollutant | Emergency | | | |
|------------------------------|-----------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 587 | 520 | 0 | 39,600 |
| Nitrogen dioxide | 20,000 | 2,000 | 0 | 11,500 |
| PM ₁₀ | 1,400 | 50 | 0 | 40,500 |
| Sulfur dioxide | 33,300 | 34 | 0 | 0 |
| Volatile organic compounds | 69 | 58 | 0 | 5,300 |
| Total suspended particulates | 1,400 | 50 | 0 | 40,500 |

Source: UC 1998g.

**Table G–60. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of
New Pit Conversion Facility at SRS**

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|---------------------|---------------------------------------|-----------|--------------|-------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.0942 | 672 |
| | 1 hour | 40,000 | 5,100 | 0.373 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0287 | 11.4 |
| | PM ₁₀ | 50 | 4.94 | 0.00182 | 4.94 |
| Sulfur dioxide | 24 hours | 150 | 85.7 | 0.026 | 85.8 |
| | Annual | 80 | 16.7 | 0.041 | 16.7 |
| | 24 hours | 365 | 222 | 0.56 | 223 |
| Total suspended particulates | 3 hours | 1,300 | 725 | 1.46 | 726 |
| | Annual | 75 | 45.4 | 0.00182 | 45.4 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

Source: EPA 1997; SCDHEC 1996.

G.4.2.2 [Text deleted.]

G.4.2.3 Immobilization Facility

G.4.2.3.1 Construction of Immobilization Facility

Potential air quality impacts from construction of new immobilization (ceramic or glass) and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–61.

Maximum air pollutant concentrations from construction activities are summarized in Table G–62.

Table G–61. Emissions (kg/yr) From Construction of New Immobilization Facility at SRS

| Pollutant | Construction | | | |
|------------------------------|--------------------|---------------------------------|----------------------|----------|
| | Diesel Equipment | Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 20,300 | 0 | 0 | 48,700 |
| Nitrogen dioxide | 52,700 | 0 | 0 | 14,100 |
| PM ₁₀ | 3,930 ^b | 11,300 | 2,610 ^b | 49,900 |
| Sulfur dioxide | 24,400 | 0 | 0 | 0 |
| Volatile organic compounds | 3,900 | 0 | 0 | 6,520 |
| Total suspended particulates | 3,930 | 21,600 | 2,610 | 49,900 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM₁₀ concentrations.

Source: UC 1999c, 1999d.

Table G–62. Concentrations (μg/m³) From Construction of New Immobilization Facility at SRS

| Pollutant | Averaging Period | Most Stringent | | | Total |
|------------------------------|------------------|------------------------------------|-----------|------------------|-------|
| | | Standard or Guideline ^a | No Action | Ceramic or Glass | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 2.89 | 674 |
| | 1 hour | 40,000 | 5,100 | 13.1 | 5,110 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.108 | 11.5 |
| | PM ₁₀ | 50 | 4.94 | 0.0366 | 4.98 |
| Sulfur dioxide | 24 hours | 150 | 85.7 | 3.56 | 89.3 |
| | Annual | 80 | 16.7 | 0.0502 | 16.7 |
| | 24 hours | 365 | 222 | 1.24 | 223 |
| Total suspended particulates | 3 hours | 1,300 | 725 | 7.42 | 732 |
| | Annual | 75 | 45.4 | 0.0581 | 45.4 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

Source: EPA 1997; SCDHEC 1996.

G.4.2.3.2 Operation of Immobilization Facility

Potential air quality impacts from operation of new immobilization (ceramic or glass) and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–63. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 41 m (135 ft) height, 5.1 m (17 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 7 m/s (23 ft/s). The boiler stack was modeled with a 38.1 m (125 ft) height, 3.01 m (9.9 ft) diameter, stack exit temperature of 160 °C (320 °F), and an exit velocity of 10.67 m/s (35 ft/s) (UC 1999c, 1999d).

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–64. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–63. Emissions (kg/yr) From Operation of New Immobilization Facility at SRS

| Pollutant | Boilers | Emergency Generator | Ceramic or Glass | |
|------------------------------|---------|---------------------|------------------|-----------------------|
| | | | Process | Vehicles ^a |
| Carbon monoxide | 370 | 980 | 0 | 46,500 |
| Nitrogen dioxide | 12,100 | 4,530 | 0 | 13,500 |
| PM ₁₀ | 940 | 320 | 0 | 47,600 |
| Sulfur dioxide | 35,500 | 300 | 0 | 0 |
| Volatile organic compounds | 80 | 370 | 0 | 6,220 |
| Total suspended particulates | 940 | 320 | 0 | 47,600 |

^a For 50-t (55-ton) case.

Source: UC 1999c, 1999d.

Table G–64. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Immobilization Facility at SRS

| Pollutant | Averaging Period | Most Stringent | | Ceramic or Glass | Total |
|------------------------------|------------------|------------------------------------|-----------|------------------|-------|
| | | Standard or Guideline ^a | No Action | | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.152 | 671 |
| | 1 hour | 40,000 | 5,100 | 0.657 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0242 | 11.4 |
| | 24 hours | 50 | 4.94 | 0.00181 | 4.94 |
| PM ₁₀ | Annual | 150 | 85.7 | 0.032 | 85.8 |
| | 24 hours | 80 | 16.7 | 0.0442 | 16.7 |
| Sulfur dioxide | Annual | 365 | 222 | 0.61 | 223 |
| | 24 hours | 1,300 | 725 | 1.63 | 727 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.00181 | 45.4 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

Source: EPA 1997; SCDHEC 1996.

G.4.2.4 MOX Facility

G.4.2.4.1 Construction of MOX Facility

Potential air quality impacts from construction of new MOX and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from construction of a new facility are higher than for modification of an existing facility described previously. Emissions from these sources are summarized in Table G–65.

Maximum air pollutant concentrations from construction activities are summarized in Table G–66.

Table G–65. Emissions (kg/yr) From Construction of New MOX Facility at SRS

| Pollutant | Construction | | | |
|------------------------------|------------------|---------------------------------|----------------------|----------|
| | Diesel Equipment | Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 3,840 | 0 | 0 | 33,600 |
| Nitrogen dioxide | 10,100 | 0 | 0 | 9,740 |
| PM ₁₀ | 768 ^b | 6,870 | 1,310 ^b | 34,400 |
| Sulfur dioxide | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 792 | 0 | 0 | 4,490 |
| Total suspended particulates | 768 | 13,600 | 1,310 | 34,400 |
| Toxics ^c | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for this analysis resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Source: UC 1998h.

Table G–66. Concentrations (μg/m³) From Construction of New MOX Facility at SRS

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|------------------|------------------------------------|-----------|--------------|-------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.547 | 672 |
| | 1 hour | 40,000 | 5,100 | 2.48 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0207 | 11.4 |
| | PM ₁₀ | 50 | 4.94 | 0.0185 | 4.96 |
| Sulfur dioxide | 24 hours | 150 | 85.7 | 1.8 | 87.5 |
| | Annual | 80 | 16.7 | 0.0021 | 16.7 |
| Total suspended particulates | 24 hours | 365 | 222 | 0.0517 | 222 |
| | 3 hours | 1,300 | 725 | 0.31 | 725 |
| Toxics ^b | 24 hours | 150 | 20.7 | 0.000224 | 20.7 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Source: EPA 1997; SCDHEC 1996.

G.4.2.4.2 Operation of MOX Facility

Potential air quality impacts from operation of the new MOX and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–67. Emergency generators were modeled as a volume source. The process stack for radiological emissions was modeled with a 8 m (26 ft) height, 0.3048 m (1.0 ft) diameter, stack exit temperature of 20 °C (68 °F), and an exit velocity of 0.03 m/s (0.1 ft/s). The boiler stack was modeled with a 38.1 m (125 ft) height, 3.01 m (9.9 ft) diameter, stack exit temperature of 160 °C (320 °F), and an exit velocity of 10.67 m/s (35 ft/s) (UC 1998h).

Table G-67. Emissions (kg/yr) From Operation of New MOX Facility at SRS

| Pollutant | Emergency | | | |
|------------------------------|-----------|-----------|---------|----------|
| | Boilers | Generator | Process | Vehicles |
| Carbon monoxide | 2,040 | 374 | 0 | 32,700 |
| Nitrogen dioxide | 5,640 | 1,740 | 0 | 9,470 |
| PM ₁₀ | 276 | 122 | 0 | 33,400 |
| Sulfur dioxide | 31,300 | 114 | 0 | 0 |
| Volatile organic compounds | 0 | 142 | 0 | 4,370 |
| Total suspended particulates | 276 | 122 | 0 | 33,400 |
| [Text deleted.] | | | | |
| [Text deleted.] | | | | |

Source: UC 1998h.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G-68. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-68. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New MOX Facility at SRS

| Pollutant | Averaging Period | Most Stringent | | | |
|------------------------------|------------------|------------------------------------|-----------|--------------|---------|
| | | Standard or Guideline ^a | No Action | Contribution | Total |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.123 | 671 |
| | 1 hour | 40,000 | 5,100 | 0.371 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0105 | 11.4 |
| | PM ₁₀ | Annual | 50 | 4.94 | 0.00059 |
| Sulfur dioxide | 24 hours | 150 | 85.7 | 0.0108 | 85.7 |
| | Annual | 80 | 16.7 | 0.0387 | 16.7 |
| | 24 hours | 365 | 222 | 0.531 | 222 |
| Total suspended particulates | 3 hours | 1,300 | 725 | 1.39 | 726 |
| | Annual | 75 | 45.4 | 0.00059 | 45.4 |
| [Text deleted.] | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Source: EPA 1997; SCDHEC 1996.

G.4.2.5 Pit Conversion and Immobilization Facilities

G.4.2.5.1 Construction of Pit Conversion and Immobilization Facilities

Potential air quality impacts from construction of new pit conversion, immobilization (ceramic or glass), and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. [Text deleted.] Construction impacts result from emissions from fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-69.

Table G-69. Emissions (kg/yr) From Construction of New Pit Conversion and Immobilization Facilities at SRS

| Pollutant | Pit Conversion | | Immobilization (Ceramic or Glass) | | | |
|------------------------------|--|--------|-----------------------------------|--|----------------------|--------|
| | Diesel Equipment and Construction Fugitive Emissions | Veh | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Veh |
| Carbon monoxide | 6,400 | 38,600 | 20,300 | 0 | 0 | 48,700 |
| Nitrogen dioxide | 29,200 | 11,200 | 52,700 | 0 | 0 | 14,100 |
| PM ₁₀ | 20,300 | 39,500 | 3,930 ^b | 11,300 | 2,610 ^b | 49,900 |
| Sulfur dioxide | 1,900 | 0 | 24,400 | 0 | 0 | 0 |
| Volatile organic compounds | 2,400 | 5,160 | 3,900 | 0 | 0 | 6,520 |
| Total suspended particulates | 47,500 | 39,500 | 3,930 | 21,600 | 2,610 | 49,900 |

^a Does not include fugitive emissions from concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM₁₀ concentrations.

Key: Veh, vehicles.

Source: UC 1998g, 1999c, 1999d.

Maximum air pollutant concentrations from construction activities are summarized in Table G-70.

Table G-70. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of New Pit Conversion and Immobilization Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | No Action | Pit Conversion | Immobilization (Ceramic or Glass) | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|-----------------------------------|-------|
| | | Standard or Guideline ^a | | | | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.911 | 2.89 | 675 |
| | 1 hour | 40,000 | 5,100 | 4.14 | 13.1 | 5,110 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0601 | 0.108 | 11.5 |
| PM ₁₀ | Annual | 50 | 4.94 | 0.0418 | 0.0366 | 5.02 |
| | 24 hours | 150 | 85.7 | 1.03 | 3.56 | 90.3 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.00391 | 0.0502 | 16.7 |
| | 24 hours | 365 | 222 | 0.0964 | 1.24 | 223 |
| Total suspended particulates | 3 hours | 1,300 | 725 | 0.578 | 7.42 | 733 |
| | Annual | 75 | 45.4 | 0.0977 | 0.0581 | 45.5 |

^a The more stringent of the Federal and state standards is presented if both exist for the averaging period.

Source: EPA 1997; SCDHEC 1996.

G.4.2.5.2 Operation of Pit Conversion and Immobilization Facilities

Potential air quality impacts from operation of new pit conversion, immobilization (ceramic or glass), and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving

materials and wastes. Emissions from these sources are summarized in Table G-71. Stack parameters used for modeling were as stated previously.

Table G-71. Emissions (kg/yr) From Operation of New Pit Conversion and Immobilization Facilities at SRS

| Pollutant | Pit Conversion | | | | Immobilization | | | |
|------------------------------|----------------|-------|---------|--------|----------------|-------|---------|------------------|
| | Boilers | EG | Process | Veh | Boilers | EG | Process | Veh ^a |
| Carbon monoxide | 587 | 520 | 0 | 39,600 | 370 | 980 | 0 | 46,500 |
| Nitrogen dioxide | 20,000 | 2,000 | 0 | 11,500 | 12,100 | 4,530 | 0 | 13,500 |
| PM ₁₀ | 1,400 | 50 | 0 | 40,500 | 940 | 320 | 0 | 47,600 |
| Sulfur dioxide | 33,300 | 34 | 0 | 0 | 35,500 | 300 | 0 | 0 |
| Volatile organic compounds | 69 | 58 | 0 | 5,300 | 80 | 370 | 0 | 6,220 |
| Total suspended particulates | 1,400 | 50 | 0 | 40,500 | 940 | 320 | 0 | 47,600 |

^a For 50-t (55-ton) case.

[Text deleted.]

Key: EG, emergency generator; Veh, vehicles.

Source: UC 1998g, 1999c, 1999d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G-72. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-72. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Pit Conversion and Immobilization Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | No Action | Pit Conversion | Immobilization (Ceramic or Glass) | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|-----------------------------------|-------|
| | | Standard or Guideline ^a | | | | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.0942 | 0.152 | 671 |
| | 1 hour | 40,000 | 5,100 | 0.373 | 0.657 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0287 | 0.0242 | 11.4 |
| PM ₁₀ | Annual | 50 | 4.94 | 0.00182 | 0.00181 | 4.94 |
| | 24 hours | 150 | 85.7 | 0.026 | 0.032 | 85.8 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.041 | 0.0442 | 16.8 |
| | 24 hours | 365 | 222 | 0.56 | 0.61 | 223 |
| | 3 hours | 1,300 | 725 | 1.46 | 1.63 | 728 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.00182 | 0.00181 | 45.4 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Source: EPA 1997; SCDHEC 1996.

G.4.2.6 Pit Conversion and MOX Facilities

G.4.2.6.1 Construction of Pit Conversion and MOX Facilities

Potential air quality impacts from construction of new pit conversion, MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Construction impacts result from emissions from diesel

fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-73.

Table G-73. Emissions (kg/yr) From Construction of New Pit Conversion and MOX Facilities at SRS

| Pollutant | Pit Conversion | | MOX | | | |
|------------------------------|--|----------|------------------|--|----------------------|----------|
| | Diesel Equipment and Construction Fugitive Emissions | Vehicles | Diesel Equipment | Construction Fugitive Emissions ^a | Concrete Batch Plant | Vehicles |
| Carbon monoxide | 6,400 | 38,600 | 3,840 | 0 | 0 | 33,600 |
| Nitrogen dioxide | 29,200 | 11,200 | 10,100 | 0 | 0 | 9,740 |
| PM ₁₀ | 20,300 | 39,500 | 768 ^b | 6,870 | 1,310 ^b | 34,400 |
| Sulfur dioxide | 1,900 | 0 | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 2,400 | 5,160 | 792 | 0 | 0 | 4,490 |
| Total suspended particulates | 47,500 | 39,500 | 768 | 13,600 | 1,310 | 34,400 |
| Toxics ^c | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Source: UC 1998g, 1998h.

Maximum air pollutant concentrations from construction activities are summarized in Table G-74.

Table G-74. Concentrations (µg/m³) From Construction of New Pit Conversion and MOX Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | | | MOX | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|----------|--------|
| | | Standard or Guideline ^a | No Action | Pit Conversion | | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.911 | 0.547 | 672 |
| | 1 hour | 40,000 | 5,100 | 4.14 | 2.48 | 5,110 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0601 | 0.0207 | 11.5 |
| | PM ₁₀ | Annual | 50 | 4.94 | 0.0418 | 0.0185 |
| 24 hours | | 150 | 85.7 | 1.03 | 1.8 | 88.5 |
| Sulfur dioxide | | Annual | 80 | 16.7 | 0.00391 | 0.0021 |
| | 24 hours | 365 | 222 | 0.0964 | 0.0517 | 222 |
| | 3 hours | 1,300 | 725 | 0.578 | 0.31 | 726 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.0977 | 0.0321 | 45.5 |
| Toxics ^b | 24 hours | 150 | 20.7 | 0 | 0.000224 | 20.7 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Various toxic air pollutants (e.g., lead, benzene, and hexane) could be emitted during construction and were analyzed as benzene.

Source: EPA 1997; SCDHEC 1996.

G.4.2.6.2 Operation of Pit Conversion and MOX Facilities

Potential air quality impacts from operation of the new pit conversion and MOX facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-75. Stack parameters used for modeling were as stated previously.

Table G-75. Emissions (kg/yr) From Operation of New Pit Conversion and MOX Facilities at SRS

| Pollutant | Pit Conversion | | | | MOX | | | |
|------------------------------|----------------|-------|---------|----------|---------|-------|---------|----------|
| | Boilers | EG | Process | Vehicles | Boilers | EG | Process | Vehicles |
| Carbon monoxide | 587 | 520 | 0 | 39,600 | 2,040 | 374 | 0 | 32,700 |
| Nitrogen dioxide | 20,000 | 2,000 | 0 | 11,500 | 5,640 | 1,740 | 0 | 9,470 |
| PM ₁₀ | 1,400 | 50 | 0 | 40,500 | 276 | 122 | 0 | 33,400 |
| Sulfur dioxide | 33,300 | 34 | 0 | 0 | 31,300 | 114 | 0 | 0 |
| Volatile organic compounds | 69 | 58 | 0 | 5,300 | 0 | 142 | 0 | 4,370 |
| Total suspended particulates | 1,400 | 50 | 0 | 40,500 | 276 | 122 | 0 | 33,400 |
| [Text deleted.] | | | | | | | | |

[Text deleted.]

Key: EG, emergency generator.

Source: UC 1998g, 1998h.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G-76. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G-76. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Pit Conversion and MOX Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | | | | |
|------------------------------|------------------|------------------------------------|-----------|----------------|---------|-------|
| | | Standard or Guideline ^a | No Action | Pit Conversion | MOX | Total |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.0942 | 0.123 | 671 |
| | 1 hour | 40,000 | 5,100 | 0.373 | 0.371 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0287 | 0.0105 | 11.4 |
| | 24 hours | 50 | 4.94 | 0.00182 | 0.00059 | 4.94 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.041 | 0.0387 | 16.8 |
| | 24 hours | 365 | 222 | 0.56 | 0.531 | 223 |
| Total suspended particulates | 3 hours | 1,300 | 725 | 1.46 | 1.39 | 728 |
| | Annual | 75 | 45.4 | 0.00182 | 0.00059 | 45.4 |
| [Text deleted.] | | | | | | |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Source: EPA 1997; SCDHEC 1996.

G.4.2.7 Immobilization and MOX Facilities

G.4.2.7.1 Construction of Immobilization and MOX Facilities

Potential air quality impacts from construction of new immobilization (ceramic or glass), MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. [Text deleted.] Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from disturbance of soil by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-77.

Table G-77. Emissions (kg/yr) From Construction of New Immobilization and MOX Facilities at SRS

| Pollutant | Immobilization (Ceramic or Glass) | | | | MOX | | | |
|------------------------------|-----------------------------------|------------------|--------------------|--------|------------------|------------------|--------------------|--------|
| | DE | CFE ^a | CBP | Veh | DE | CFE ^a | CBP | Veh |
| Carbon monoxide | 20,300 | 0 | 0 | 48,700 | 3,840 | 0 | 0 | 33,600 |
| Nitrogen dioxide | 52,700 | 0 | 0 | 14,100 | 10,100 | 0 | 0 | 9,740 |
| PM ₁₀ | 3,930 ^b | 11,300 | 2,610 ^b | 49,900 | 768 ^b | 6,810 | 1,310 ^b | 34,400 |
| Sulfur dioxide | 24,400 | 0 | 0 | 0 | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 3,900 | 0 | 0 | 6,520 | 792 | 0 | 0 | 4,490 |
| Total suspended particulates | 3,930 | 21,600 | 2,610 | 49,900 | 768 | 13,600 | 1,310 | 34,400 |
| Toxics ^c | 0 | 0 | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Key: CBP, concrete batch plant; CFE, construction fugitive emissions; DE, diesel equipment; Veh, vehicles.

Source: UC 1998h, 1999c, 1999d.

Maximum air pollutant concentrations from construction activities are summarized in Table G-78.

Table G-78. Concentrations (μg/m³) From Construction of New Immobilization and MOX Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | No Action | Immobilization | MOX | Total |
|------------------------------|------------------|------------------------------------|-----------|--------------------|----------|-------|
| | | Standard or Guideline ^a | | (Ceramic or Glass) | | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 2.89 | 0.547 | 675 |
| | 1 hour | 40,000 | 5,100 | 13.1 | 2.48 | 5,110 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.108 | 0.0207 | 11.5 |
| PM ₁₀ | Annual | 50 | 4.94 | 0.0366 | 0.0185 | 5 |
| | 24 hours | 150 | 85.7 | 3.56 | 1.8 | 91.1 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.0502 | 0.0021 | 16.7 |
| | 24 hours | 365 | 222 | 1.24 | 0.0517 | 223 |
| | 3 hours | 1,300 | 725 | 7.42 | 0.31 | 733 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.0581 | 0.0321 | 45.5 |
| Toxics ^b | 24 hours | 150 | 20.7 | 0 | 0.000224 | 20.7 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Source: EPA 1997; SCDHEC 1996.

G.4.2.7.2 Operation of Immobilization and MOX Facilities

Potential air quality impacts from operation of new immobilization (ceramic or glass), MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from boilers, emergency diesel generators, process emissions, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G-79. Stack parameters used for modeling were as stated previously.

Table G-79. Emissions (kg/yr) From Operation of New Immobilization and MOX Facilities at SRS

| Pollutant | Immobilization | | | | MOX | | | |
|------------------------------|----------------|---------------------|----------------------|----------|---------|---------------------|---------|----------|
| | Boilers | Emergency Generator | Process ^a | Vehicles | Boilers | Emergency Generator | Process | Vehicles |
| Carbon monoxide | 370 | 980 | 0 | 44,400 | 2,040 | 374 | 0 | 32,700 |
| Nitrogen dioxide | 12,100 | 4,530 | 0 | 12,900 | 5,640 | 1,740 | 0 | 9,470 |
| PM ₁₀ | 940 | 320 | 0 | 45,400 | 276 | 122 | 0 | 33,400 |
| Sulfur dioxide | 35,500 | 300 | 0 | 0 | 31,300 | 114 | 0 | 0 |
| Volatile organic compounds | 80 | 370 | 0 | 5,940 | 0 | 142 | 0 | 4,370 |
| Total suspended particulates | 940 | 320 | 0 | 45,400 | 276 | 122 | 0 | 33,400 |

[Text deleted.]

^a Ceramic or glass.

[Text deleted.]

Source: UC 1998h, 1999c, 1999d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G-80. Radiological impacts, including those from emissions to the air, are discussed in Appendix J.

Table G–80. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Immobilization and MOX Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | | | | |
|------------------------------|------------------|------------------------------------|-----------|----------------|---------|-------|
| | | Standard or Guideline ^a | No Action | Immobilization | MOX | Total |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.152 | 0.123 | 671 |
| | 1 hour | 40,000 | 5,100 | 0.657 | 0.371 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0242 | 0.0105 | 11.4 |
| PM ₁₀ | Annual | 50 | 4.94 | 0.00181 | 0.00059 | 4.94 |
| | 24 hours | 150 | 85.7 | 0.032 | 0.0108 | 85.8 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.0442 | 0.0388 | 16.8 |
| | 24 hours | 365 | 222 | 0.61 | 0.531 | 223 |
| | 3 hours | 1,300 | 725 | 1.63 | 1.39 | 728 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.00181 | 0.00059 | 45.4 |

[Text deleted.]

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Source: EPA 1997; SCDHEC 1996.

G.4.2.8 Pit Conversion, Immobilization, and MOX Facilities

G.4.2.8.1 Construction of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from construction of new pit conversion, immobilization (ceramic or glass), MOX, and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. [Text deleted.] Construction impacts result from emissions from diesel fuel-burning construction equipment, particulate matter emissions from soil disturbance by construction equipment and other vehicles (construction fugitive emissions), operation of a concrete batch plant, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–81.

Table G–81. Emissions (kg/yr) From Construction of New Pit Conversion, Immobilization, and MOX Facilities at SRS

| Pollutant | Pit Conversion | | Immobilization (Ceramic or Glass) | | | | MOX | | | |
|------------------------------|----------------|--------|-----------------------------------|------------------|--------------------|--------|------------------|------------------|--------------------|--------|
| | DE & CFE | Veh | DE | CFE ^a | CBP | Veh | DE | CFE ^a | CBP | Veh |
| Carbon monoxide | 6,400 | 38,600 | 20,300 | 0 | 0 | 48,700 | 3,840 | 0 | 0 | 33,600 |
| Nitrogen dioxide | 29,200 | 11,200 | 52,700 | 0 | 0 | 14,100 | 10,080 | 0 | 0 | 9,740 |
| PM ₁₀ | 20,300 | 39,500 | 3,930 ^b | 11,300 | 2,610 ^b | 49,900 | 768 ^b | 6,870 | 1,310 ^b | 34,400 |
| Sulfur dioxide | 1,900 | 0 | 24,400 | 0 | 0 | 0 | 1,020 | 0 | 0 | 0 |
| Volatile organic compounds | 2,400 | 5,160 | 3,900 | 0 | 0 | 6,520 | 792 | 0 | 0 | 4,490 |
| Total suspended particulates | 47,500 | 39,500 | 3,930 | 21,600 | 2,610 | 49,900 | 768 | 13,600 | 1,310 | 34,400 |
| Toxics ^c | 0 | 0 | 0 | 0 | 0 | 0 | 0 | <1 | 0 | 0 |

^a Does not include fugitive emissions from the concrete batch plant.

^b PM₁₀ emissions were assumed to be the same as total suspended particulate emissions for this analysis, resulting in some overestimate of PM₁₀ concentrations.

^c Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction.

Key: CBP, concrete batch plant; CFE, construction fugitive emissions; DE, diesel equipment; Veh, vehicles.

Source: UC 1998g, 1998h, 1999c, 1999d.

Maximum air pollutant concentrations from construction activities are summarized in Table G–82.

Table G–82. Concentrations ($\mu\text{g}/\text{m}^3$) From Construction of New Pit Conversion, Immobilization, and MOX Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | | | | | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|-----------------------------------|----------|-------|
| | | Standard or Guideline ^a | No Action | Pit Conversion | Immobilization (Ceramic or Glass) | MOX | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.911 | 2.89 | 0.547 | 675 |
| | 1 hour | 40,000 | 5,100 | 4.14 | 13.1 | 2.48 | 5,120 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0601 | 0.108 | 0.0207 | 11.6 |
| PM ₁₀ | Annual | 50 | 4.94 | 0.0418 | 0.0366 | 0.0185 | 5.04 |
| | 24 hours | 150 | 85.7 | 1.03 | 3.56 | 1.8 | 92.1 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.00391 | 0.0502 | 0.0021 | 16.7 |
| | 24 hours | 365 | 222 | 0.0964 | 1.24 | 0.0517 | 223 |
| | 3 hours | 1,300 | 725 | 0.578 | 7.42 | 0.31 | 733 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.0977 | 0.0581 | 0.0321 | 45.6 |
| Toxics ^b | 24 hours | 150 | 20.7 | 0 | 0 | 0.000224 | 20.7 |

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

^b Various toxic air pollutants (e.g., lead, benzene, hexane) could be emitted during construction and were analyzed as benzene.

Source: EPA 1997; SCDHEC 1996.

G.4.2.8.2 Operation of Pit Conversion, Immobilization, and MOX Facilities

Potential air quality impacts from operation of the three surplus plutonium disposition and support facilities at SRS were analyzed using ISCST3 as described in Appendix F.1. Operational impacts result from emissions from emergency diesel generators, process emissions, steam boilers, employee vehicles, and trucks moving materials and wastes. Emissions from these sources are summarized in Table G–83. Stack parameters used for modeling were as stated previously.

Table G–83. Emissions (kg/yr) From Operation of New Pit Conversion, Immobilization, and MOX Facilities at SRS

| Pollutant | Pit Conversion | | | | Immobilization | | | | MOX | | | |
|------------------|----------------|-------|---------|--------|----------------|-------|----------------------|--------|---------|-------|---------|--------|
| | Boilers | EG | Process | Veh | Boilers | EG | Process ^a | Veh | Boilers | EG | Process | Veh |
| CO | 587 | 520 | 0 | 39,600 | 370 | 980 | 0 | 44,400 | 2,040 | 374 | 0 | 32,700 |
| NO ₂ | 20,000 | 2,000 | 0 | 11,500 | 12,100 | 4,530 | 0 | 12,900 | 5,640 | 1,740 | 0 | 9,470 |
| PM ₁₀ | 1,400 | 50 | 0 | 40,500 | 940 | 320 | 0 | 45,400 | 276 | 122 | 0 | 33,400 |
| SO ₂ | 33,300 | 34 | 0 | 0 | 35,500 | 300 | 0 | 0 | 31,300 | 114 | 0 | 0 |
| VOC | 69 | 58 | 0 | 5,300 | 80 | 370 | 0 | 5,940 | 0 | 142 | 0 | 4,370 |
| TSP | 1,400 | 50 | 0 | 40,500 | 940 | 320 | 0 | 45,400 | 276 | 122 | 0 | 33,400 |

[Text deleted.]

^a Ceramic or glass.

[Text deleted.]

Key: CO, carbon monoxide; EG, emergency generator; NO₂, nitrogen dioxide; SO₂, sulfur dioxide; TSP, total suspended particulates; Veh, vehicles; VOC, volatile organic compounds.

Source: UC 1998g, 1998h, 1999c, 1999d.

Maximum air pollutant concentrations resulting from the boilers, emergency diesel generators, and process sources, plus the No Action concentrations, are summarized in Table G–84. Radiological impacts, including those emissions to the air, are discussed in Appendix J.

Table G-84. Concentrations ($\mu\text{g}/\text{m}^3$) From Operation of New Pit Conversion, Immobilization, and MOX Facilities at SRS

| Pollutant | Averaging Period | Most Stringent | | Immobilization | | | Total |
|------------------------------|------------------|------------------------------------|-----------|----------------|--------------------|---------|-------|
| | | Standard or Guideline ^a | No Action | Pit Conversion | (Ceramic or Glass) | MOX | |
| Carbon monoxide | 8 hours | 10,000 | 671 | 0.0942 | 0.152 | 0.123 | 671 |
| | 1 hour | 40,000 | 5,100 | 0.373 | 0.657 | 0.371 | 5,100 |
| Nitrogen dioxide | Annual | 100 | 11.4 | 0.0287 | 0.0242 | 0.0105 | 11.4 |
| PM ₁₀ | Annual | 50 | 4.94 | 0.00182 | 0.00181 | 0.00059 | 4.94 |
| | 24 hours | 150 | 85.7 | 0.0261 | 0.032 | 0.0108 | 85.8 |
| Sulfur dioxide | Annual | 80 | 16.7 | 0.041 | 0.0442 | 0.0387 | 16.8 |
| | 24 hours | 365 | 222 | 0.56 | 0.61 | 0.531 | 224 |
| | 3 hours | 1,300 | 725 | 1.46 | 1.63 | 1.39 | 729 |
| Total suspended particulates | Annual | 75 | 45.4 | 0.00182 | 0.00181 | 0.00059 | 45.4 |

[Text deleted.]

^a The more stringent of the Federal and State standards is presented if both exist for the averaging period.

[Text deleted.]

Source: EPA 1997; SCDHEC 1996.

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