

**Table 3.5.1–1. Summary of Environmental Impacts**

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
<b>LAND USE</b>							
Percent of available site disturbed	No change <sup>a</sup>	~ 0.03 %	~ 0.6–0.7%	~ 0.02%	~ 0.9–1.1%	~ 0.07–0.09%	~ 1.4–1.7%
<b>SITE INFRASTRUCTURE (Operations)</b>							
<b>80 ppy</b>							
Electrical Supply	No change <sup>a</sup>	Adequate	—	—	—	—	—
Fuel for Process Supply	No change <sup>a</sup>	Steam Available	—	—	—	—	—
<b>125 ppy</b>							
Electrical Supply	—	—	Adequate	Additional energy capacity and peak load capability would be needed	Adequate	Adequate	Additional peak load capacity would be needed
Fuel for Process Supply	—	—	Steam Available	Pipeline/Rail line required	Steam Available	Steam Available	Extension of existing pipeline required
<b>250 ppy</b>							
Electrical Supply	—	—	Adequate	Additional energy capacity and peak load capability would be needed	Adequate	Adequate	Additional peak load capability would be needed
Fuel for Process Supply	—	—	Steam Available	Pipeline/Rail line required	Steam Available	Steam Available	Extension of existing pipeline required
<b>450 ppy</b>							
Electrical Supply	—	—	Additional peak load capability would be needed	Additional energy capacity and peak load capability would be needed	Additional energy capacity would be needed	Adequate	Additional energy capacity and peak load capability would be needed
Fuel for Process Supply	—	—	Steam Available	Pipeline/Rail line required	Steam Available	Steam Available	Extension of existing pipeline required

**Table 3.5.1–1. Summary of Environmental Impacts (continued)**

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
<b>WATER RESOURCES</b>							
<i>Construction – All Capacity Sizes</i>							
Adequate site water allotment	No change <sup>a</sup>	yes	yes	yes	yes	yes	yes
<i>Operations</i>							
<b>80 ppy</b>							
Adequate site water allotment	No change <sup>a</sup>	yes	—	—	—	—	—
<b>125 ppy</b>							
Adequate site water allotment	—	—	yes	yes	yes	yes	no
<b>250 ppy</b>							
Adequate site water allotment	—	—	no	yes	yes	yes	no
<b>450 ppy</b>							
Adequate site water allotment	—	—	no	yes	yes	yes	no
<b>BIOLOGICAL RESOURCES</b>							
<i>Terrestrial – All Capacity Sizes</i>							
	No impact	No impact	Approximately 56-69 ha of low value vegetation and potential habitat modified or lost; decrease in quality of habitat adjacent to proposed development	Approximately 56-69 ha of primarily shrubland habitat cleared, modified, or lost; decrease in quality of habitat adjacent to proposed development	Approximately 56-69 ha of shortgrass prairie and habitat cleared or modified; loss of shortgrass prairie plant community and wildlife habitat; decrease in quality of habitat adjacent to proposed development	Approximately 56-69 ha of potential forested habitat modified or lost; decrease in quality of habitat adjacent to proposed development	Approximately 56-69 ha cleared, modified or lost of grass and shrub plant communities and wildlife habitat; decrease in quality of habitat adjacent to proposed development

**Table 3.5.1–1. Summary of Environmental Impacts (continued)**

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
<b>SOCIOECONOMICS<sup>b</sup></b>							
<i>Construction – Jobs Created</i>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	Direct: 190 Indirect: 120	—	—	—	—	—
125 ppy	—	—	Direct: 770 Indirect: 480	Direct: 770 Indirect: 740	Direct: 770 Indirect: 660	Direct: 770 Indirect: 550	Direct: 770 Indirect: 280
250 ppy	—	—	Direct: 850 Indirect: 530	Direct: 850 Indirect: 820	Direct: 850 Indirect: 730	Direct: 850 Indirect: 610	Direct: 850 Indirect: 300
450 ppy	—	—	Direct: 1,100 Indirect: 690	Direct: 1,100 Indirect: 1,060	Direct: 1,100 Indirect: 940	Direct: 1,100 Indirect: 790	Direct: 1,100 Indirect: 390
<i>Operations – Jobs Created</i>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	Direct: 660 Indirect: 220	—	—	—	—	—
125 ppy	—	—	Direct: 990 Indirect: 280	Direct: 990 Indirect: 620	Direct: 990 Indirect: 710	Direct: 990 Indirect: 950	Direct: 990 Indirect: 240
250 ppy	—	—	Direct: 1,360 Indirect: 390	Direct: 1,360 Indirect: 850	Direct: 1,360 Indirect: 980	Direct: 1,360 Indirect: 620	Direct: 1,360 Indirect: 330
450 ppy	—	—	Direct: 1,800 Indirect: 510	Direct: 1,800 Indirect: 1,130	Direct: 1,800 Indirect: 1,290	Direct: 1,800 Indirect: 820	Direct: 1,800 Indirect: 430
<b>POPULATION AND HOUSING<sup>c</sup></b>							
<i>Construction – Total Expected New Residents</i>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	150	—	—	—	—	—
125 ppy	—	—	1,600	No impact	1,400	140	1,700
250 ppy	—	—	1,900	No impact	1,600	350	1,900
450 ppy	—	—	2,500	No impact	2,300	1,000	2,600
<i>Operations – Expected New Residents</i>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	335	—	—	—	—	—
125 ppy	—	—	1,100	No impact	1,400	No impact	1,900

Table 3.5.1–1. Summary of Environmental Impacts (continued)

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
250 ppy	—	—	2,100	No impact	2,400	No impact	2,800
450 ppy	—	—	3,200	No impact	3,500	No impact	3,900
<b>COMMUNITY SERVICES</b>							
<i>All Capacity Sizes</i>	No impact	No impact	No impact	No impact	No impact	No impact	Potential impact
<b>HUMAN HEALTH AND SAFETY</b>							
<i>Annual Radiological Impacts to Individual MPF Workers</i>							
<b>Individual Workers – Average individual dose, mrem/yr</b>							
80 ppy	No change <sup>a</sup>	380	—	—	—	—	—
125 ppy	—	—	290	290	290	290	290
250 ppy	—	—	390	390	390	390	390
450 ppy	—	—	510	510	510	510	510
<b>Average worker cancer fatality risk</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	$1.5 \times 10^{-4}$	—	—	—	—	—
125 ppy	—	—	$1.2 \times 10^{-4}$	$1.2 \times 10^{-4}$	$1.2 \times 10^{-4}$	$1.2 \times 10^{-4}$	$1.2 \times 10^{-4}$
250 ppy	—	—	$1.6 \times 10^{-4}$	$1.6 \times 10^{-4}$	$1.6 \times 10^{-4}$	$1.6 \times 10^{-4}$	$1.6 \times 10^{-4}$
450 ppy	—	—	$2.0 \times 10^{-4}$	$2.0 \times 10^{-4}$	$2.0 \times 10^{-4}$	$2.0 \times 10^{-4}$	$2.0 \times 10^{-4}$
<i>Annual Radiological Impacts to MPF Worker Population</i>							
<b>Collective dose, person-rem</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	154	—	—	—	—	—
125 ppy	—	—	160	160	160	160	160
250 ppy	—	—	310	310	310	310	310
450 ppy	—	—	560	560	560	560	560
<b>Cancer fatality risk</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	0.062	—	—	—	—	—
125 ppy	—	—	0.064	0.064	0.064	0.064	0.064
250 ppy	—	—	0.12	0.12	0.12	0.12	0.12
450 ppy	—	—	0.22	0.22	0.22	0.22	0.22

**Table 3.5.1–1. Summary of Environmental Impacts (continued)**

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
<i>Annual Radiological Impacts on Public</i>							
<b>Population within 80 km (50 mi)</b>							
<b>Collective dose, person-rem</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	$2.5 \times 10^{-8}$	—	—	—	—	—
125 ppy	—	—	$3.4 \times 10^{-7}$	$2.7 \times 10^{-8}$	$1.2 \times 10^{-7}$	$4.2 \times 10^{-7}$	$4.2 \times 10^{-8}$
250 ppy	—	—	$5.5 \times 10^{-7}$	$4.3 \times 10^{-8}$	$2.0 \times 10^{-7}$	$7.0 \times 10^{-7}$	$6.8 \times 10^{-8}$
450 ppy	—	—	$1.0 \times 10^{-6}$	$7.7 \times 10^{-8}$	$3.6 \times 10^{-7}$	$1.3 \times 10^{-6}$	$1.2 \times 10^{-7}$
<b>LCFs</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	$1.2 \times 10^{-11}$	—	—	—	—	—
125 ppy	—	—	$1.7 \times 10^{-10}$	$1.3 \times 10^{-11}$	$6.2 \times 10^{-11}$	$2.1 \times 10^{-10}$	$2.1 \times 10^{-11}$
250 ppy	—	—	$2.8 \times 10^{-10}$	$2.1 \times 10^{-11}$	$1.0 \times 10^{-10}$	$3.5 \times 10^{-10}$	$3.4 \times 10^{-11}$
450 ppy	—	—	$5.0 \times 10^{-10}$	$3.8 \times 10^{-11}$	$1.8 \times 10^{-10}$	$6.5 \times 10^{-10}$	$6.2 \times 10^{-11}$
<b>Offsite MEI – Dose (mrem)</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	$3.0 \times 10^{-9}$	—	—	—	—	—
125 ppy	—	—	$4.1 \times 10^{-8}$	$1.6 \times 10^{-9}$	$1.7 \times 10^{-8}$	$2.6 \times 10^{-9}$	$2.3 \times 10^{-8}$
250 ppy	—	—	$6.6 \times 10^{-8}$	$2.5 \times 10^{-9}$	$2.8 \times 10^{-8}$	$4.3 \times 10^{-9}$	$3.6 \times 10^{-8}$
450 ppy	—	—	$1.2 \times 10^{-7}$	$3.8 \times 10^{-9}$	$5.0 \times 10^{-8}$	$8.0 \times 10^{-9}$	$6.5 \times 10^{-8}$
<b>Cancer fatality risk</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	$1.5 \times 10^{-15}$	—	—	—	—	—
125 ppy	—	—	$2.1 \times 10^{-14}$	$8.0 \times 10^{-16}$	$8.5 \times 10^{-15}$	$1.3 \times 10^{-15}$	$1.2 \times 10^{-14}$
250 ppy	—	—	$3.3 \times 10^{-14}$	$1.3 \times 10^{-15}$	$1.4 \times 10^{-14}$	$2.2 \times 10^{-15}$	$1.8 \times 10^{-14}$
450 ppy	—	—	$6.0 \times 10^{-14}$	$2.3 \times 10^{-15}$	$2.5 \times 10^{-14}$	$4.0 \times 10^{-15}$	$3.3 \times 10^{-14}$
<i>Nonradiological Impacts</i>							
<b>Construction total fatalities for project duration</b>	—	—	—	—	—	—	—
80 ppy	—	0.09	—	—	—	—	—
125 ppy	—	—	0.54	0.54	0.54	0.54	0.54
250 ppy	—	—	0.60	0.60	0.60	0.60	0.60
450 ppy	—	—	0.78	0.78	0.78	0.78	0.78

Table 3.5.1–1. Summary of Environmental Impacts (continued)

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
<b>Operations total fatalities per year</b>	No change <sup>a</sup>	—	—	—	—	—	—
80 ppy	—	0.025	—	—	—	—	—
125 ppy	—	—	0.04	0.04	0.04	0.04	0.04
250 ppy	—	—	0.05	0.05	0.05	0.05	0.05
450 ppy	—	—	0.07	0.07	0.07	0.07	0.07
<b>ACCIDENTS (Maximum Annual Cancer Risk for Highest Risk Accident)</b>							
Population	No change <sup>d</sup>	0.125	0.125	0.003	0.023	0.035	0.0081
MEI	No change <sup>d</sup>	$3.8 \times 10^{-4}$	$3.8 \times 10^{-4}$	$7.4 \times 10^{-6}$	$8.8 \times 10^{-5}$	$9.6 \times 10^{-6}$	$3.1 \times 10^{-4}$
<b>TRANSPORTATION</b>							
<i>Operations – Annual Incident Free-collective dose (person-rem/LCFs)</i>							
<b>Transportation Workers</b>	0.23/ $9.1 \times 10^{-5}$	—	—	—	—	—	—
80 ppy	—	0.54/ $2.2 \times 10^{-4}$	—	—	—	—	—
125 ppy	—	—	$0.76/3.0 \times 10^{-4}$	$2.2/9.0 \times 10^{-4}$	$4.2/1.7 \times 10^{-3}$	$3.1/1.2 \times 10^{-3}$	$3.7/1.5 \times 10^{-3}$
250 ppy	—	—	$1.1/4.5 \times 10^{-4}$	$3.1/1.2 \times 10^{-3}$	$6.6/2.6 \times 10^{-3}$	$4.1/1.6 \times 10^{-3}$	$6.0/2.4 \times 10^{-3}$
450 ppy	—	—	$1.8/7.3 \times 10^{-4}$	$4.9/2.0 \times 10^{-3}$	$10/4.0 \times 10^{-3}$	$6.4/2.5 \times 10^{-3}$	$9.2/3.7 \times 10^{-3}$
<b>General Public</b>	0.36/ $1.8 \times 10^{-4}$	—	—	—	—	—	—
80 ppy	—	0.88/ $4.4 \times 10^{-4}$	—	—	—	—	—
125 ppy	—	—	$1.2/6.2 \times 10^{-4}$	$3.6/1.8 \times 10^{-3}$	$3.4/1.7 \times 10^{-3}$	$5.8/2.9 \times 10^{-3}$	$2.6/1.3 \times 10^{-3}$
250 ppy	—	—	$1.8/8.8 \times 10^{-4}$	$4.9/2.5 \times 10^{-3}$	$5.1/2.7 \times 10^{-3}$	$7.6/3.8 \times 10^{-3}$	$4.3/2.2 \times 10^{-3}$
450 ppy	—	—	$2.9/1.4 \times 10^{-3}$	$7.8/3.9 \times 10^{-3}$	$8.0/4.0 \times 10^{-3}$	$12.0/5.9 \times 10^{-3}$	$6.8/3.4 \times 10^{-3}$
<b>Operations – Radiological Accident Impact</b>	$4.6 \times 10^{-5}/$ $2.3 \times 10^{-8}$	—	—	—	—	—	—
80 ppy	—	$1.3 \times 10^{-4}/$ $6.4 \times 10^{-8}$	—	—	—	—	—
125 ppy	—	—	$1.7 \times 10^{-4}/$ $8.6 \times 10^{-8}$	$9.2 \times 10^{-4}/$ $4.6 \times 10^{-7}$	$1.1 \times 10^{-3}/$ $5.5 \times 10^{-7}$	0.011/ $5.4 \times 10^{-6}$	$4.3 \times 10^{-4}/$ $2.2 \times 10^{-7}$

**Table 3.5.1–1. Summary of Environmental Impacts (continued)**

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
250 ppy	—	—	$2.2 \times 10^{-4}$ / $1.1 \times 10^{-7}$	$1.2 \times 10^{-3}$ / $5.8 \times 10^{-7}$	$1.6 \times 10^{-3}$ / $8.1 \times 10^{-7}$	0.013/ $6.7 \times 10^{-6}$	$6.9 \times 10^{-4}$ / $3.5 \times 10^{-7}$
450 ppy	—	—	$3.3 \times 10^{-4}$ / $1.6 \times 10^{-7}$	$1.8 \times 10^{-3}$ / $8.8 \times 10^{-7}$	$2.5 \times 10^{-3}$ / $8.1 \times 10^{-7}$	0.021/ $1.0 \times 10^{-5}$	$1.1 \times 10^{-3}$ / $5.3 \times 10^{-7}$
<b>WASTE MANAGEMENT – Annual Operations (m<sup>3</sup>)</b>							
<b>80 ppy</b>							
TRU Waste–solid	—	445 <sup>e</sup>	—	—	—	—	—
LLW–solid	—	1,445 <sup>e</sup>	—	—	—	—	—
Mixed LLW–solid and liquid	—	53 <sup>e</sup>	—	—	—	—	—
Hazardous waste–solid and liquid	—	205 <sup>e</sup>	—	—	—	—	—
Adequate onsite LLW disposal facilities	—	Adequate	—	—	—	—	—
<b>125 ppy</b>							
TRU Waste–solid	—	—	590 m <sup>3</sup>	590 m <sup>3</sup>	590 m <sup>3</sup>	590 m <sup>3</sup>	590 m <sup>3</sup>
LLW–solid	—	—	2,070 m <sup>3</sup>	2,070 m <sup>3</sup>	2,070 m <sup>3</sup>	2,070 m <sup>3</sup>	2,070 m <sup>3</sup>
Mixed LLW–solid and liquid	—	—	1.7 m <sup>3</sup>	1.7 m <sup>3</sup>	1.7 m <sup>3</sup>	1.7 m <sup>3</sup>	1.7 m <sup>3</sup>
Hazardous waste–solid and liquid	—	—	2.8 m <sup>3</sup>	2.8 m <sup>3</sup>	2.8 m <sup>3</sup>	2.8 m <sup>3</sup>	2.8 m <sup>3</sup>
Adequate onsite LLW disposal facilities	—	—	Adequate	Adequate	No onsite disposal; additional onsite capacity would be needed until LLW transferred	Adequate	No onsite disposal capability for MPF LLW waste
<b>250 ppy</b>							
TRU Waste–solid	—	—	740 m <sup>3</sup>	740 m <sup>3</sup>	740 m <sup>3</sup>	740 m <sup>3</sup>	740 m <sup>3</sup>
LLW–solid	—	—	3,300 m <sup>3</sup>	3,300 m <sup>3</sup>	3,300 m <sup>3</sup>	3,300 m <sup>3</sup>	3,300 m <sup>3</sup>
Mixed LLW–solid and liquid	—	—	2.4 m <sup>3</sup>	2.4 m <sup>3</sup>	2.4 m <sup>3</sup>	2.4 m <sup>3</sup>	2.4 m <sup>3</sup>
Hazardous waste–solid and liquid	—	—	3.4 m <sup>3</sup>	3.4 m <sup>3</sup>	3.4 m <sup>3</sup>	3.4 m <sup>3</sup>	3.4 m <sup>3</sup>

**Table 3.5.1–1. Summary of Environmental Impacts (continued)**

Resource/Material Categories	No Action Alternative	TA-55 Upgrade Alternative (80 ppy)	Los Alamos Site Alternative	NTS Alternative	Pantex Site Alternative	SRS Alternative	Carlsbad Site Alternative
Adequate onsite LLW disposal facilities	—	—	Adequate	Adequate	No onsite disposal; additional onsite capacity would be needed until LLW transferred	Additional capacity required for currently planned LLW facilities	No onsite disposal capability for MPF LLW waste
<b>450 ppy</b>							
TRU Waste–solid	—	—	1,130 m <sup>3</sup>	1,130 m <sup>3</sup>	1,130 m <sup>3</sup>	1,130 m <sup>3</sup>	1,130 m <sup>3</sup>
LLW–solid	—	—	5,030 m <sup>3</sup>	5,030 m <sup>3</sup>	5,030 m <sup>3</sup>	5,030 m <sup>3</sup>	5,030 m <sup>3</sup>
Mixed LLW–solid and liquid	—	—	4.2 m <sup>3</sup>	4.2 m <sup>3</sup>	4.2 m <sup>3</sup>	4.2 m <sup>3</sup>	4.2 m <sup>3</sup>
Hazardous waste–solid and liquid	—	—	5.6 m <sup>3</sup>	5.6 m <sup>3</sup>	5.6 m <sup>3</sup>	5.6 m <sup>3</sup>	5.6 m <sup>3</sup>
Adequate onsite LLW disposal facilities	—	—	Adequate	Adequate	No onsite disposal; additional onsite capacity would be needed until LLW transferred	Additional capacity required for currently planned LLW facilities	No onsite disposal capability for MPF LLW waste

<sup>a</sup> No change from current operations.

<sup>b</sup> Differences in the number of indirect jobs created at each site are based upon unique Bureau of Economic Analysis multipliers for each site region.

<sup>c</sup> Total population impacts were determined by multiplying the number of workers required from outside the ROI by the average household size for the United States. The number of in-migrating workers was determined based on the current ROI labor force composition and unemployment rates.

<sup>d</sup> No Action accidents addressed by existing documentation.

<sup>e</sup> Operational waste valves for the upgrade include the removal of 140 gloveboxes over a 10-year period, and additional hazardous waste from the pyrochemical process.

Offsite MEI = Maximally Exposed Offsite Individual.

LCF = Latent Cancer Fatality.