RAI PA-1

4.5.12 Special Maintenance Practices Used in Important Habitats

No important habitats (e.g., marshes, natural areas, bogs) have been identified within the *133.4 ha (330 acres)* CISF. Therefore, no special maintenance practices are proposed.

4.5.13 Wildlife Management Practices

Several best management practices to limit or minimize impacts to existing wildlife habitat in association with the CISF will be included. These best management practices include:

- Use of design and BMPs to minimize the construction footprint to the extent possible
- Site stabilization practices to reduce the potential for erosion and sedimentation
- When possible, leave open areas undisturbed, including areas of native grasses and shrubs for the benefit of wildlife
- The use of native plant species to re-vegetate disturbed areas to enhance wildlife habitat

4.5.14 Practices and Procedures to Minimize Adverse Impacts

Several practices and procedures have been designed to minimize adverse impacts to the ecological resources of the proposed CISF. These practices and procedures include the use of BMPs, minimizing the construction footprint to the extent possible, avoiding all direct discharge (including storm water) to any waters of the U. S., the protection of all undisturbed naturalized areas, and site stabilization practices to reduce the potential for erosion and sedimentation. The use of native plant species to re-vegetate disturbed areas will enhance and maximize the opportunity for native wildlife habitat to be reestablished at the site.

RAI AQ-4

4.6 AIR QUALITY IMPACTS

The greatest expected air quality impacts would be attributed to products of combustion from construction and earthmoving equipment and fugitive dust involved in site preparation and construction. Air quality impacts from construction site preparation for the proposed CISF were evaluated using AERMOD version 15181 to determine hourly impacts and emission rates quantified for these sources. Emission rates for products of combustion and fugitive dust were calculated using emission factors provided in AP-42, the EPA's Compilation of Air Pollutant Emission Factors (EPA, 1995), and the most recent emissions standards from the EPA with regard to on-road and non-road engines. Emission rates for construction activities were estimated for a 10-hour workday assuming peak construction activity levels were maintained for

approximately eight months of the year. The calculated impacts of emissions of products of combustion and fugitive dust are compared to the National Ambient Air Quality Standards (NAAQS) and are presented in Table 4.6-1 and Table 4.6-2 for construction activities and Table 4.6-3 for operations activities.

Fugitive dust emissions were estimated using an AP-42 emission factor for construction site preparation that was adjusted to account for dust suppression measures (per TCEQ's Rock Crushing Plant Emission Calculation Workbook) and the fraction of total suspended particulate that is expected to be in the range of particulates less than or equal to 10 micrometers (PM_{10}) in diameter and 2.5 micrometers ($PM_{2.5}$) in diameter. Emissions were modeled as a point source for engines and a series of volume sources for fugitive dust with emissions occurring 10 hours per day, 5 days per week, and 34.5 weeks per year. Emissions of criteria pollutants from construction activities are below the NAAQS.

Construction and operation emissions lifetime totals are shown in Table 4.6-4.

Air quality impacts are expected to be highest during phase 1 of construction, with subsequent phases of construction having less emissions. Operational emissions would be intermittent and would not be expected to contribute to an exceedance of any ambient air quality standard, as shown in Table 4.6-3. Visibility impacts during construction would be minimal and water spray dust suppressants would be used to help minimize visibility impacts. During operation, there are no anticipated visibility impacts. The proposed CISF would be designed and constructed in a manner that would minimize the quantity of radioactive wastes and contaminated equipment, and facilitate the removal of radioactive wastes and contaminated materials at the time the proposed CISF is permanently decommissioned pursuant to 10 CFR 72.130, Criteria for decommissioning. At the time of license termination, the site would be released for unrestricted use in accordance with 10 CFR 20, Subpart E, and the site would be abandoned in place. Therefore, the impact to air quality during decommissioning would be negligible, if any at all.

All Indicated Changes are in response to RAI AQ-4

Table 4.6-1
NAAQS Compliance Demonstration – Phase 1

(5 pages)

1-Hour NO2, SO2, and CO NAAQS

Phase	Emissions Source	1-hr NOx Emission Rate (lb/hr)	1-hr SO2 Emission Rate (lb/hr)	1-hr CO Emission Rate (lb/hr)	NO2[1] AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	NO2[2] Background Concentration (µg/m³)	NO2 Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?	SO2 AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	SO2[3] Background Concentration (µg/m³)	SO2 Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?	CO AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	CO[4] Background Concentration (µg/m³)	CO Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?
Earthwork	HHT	0.62	2.87	9.35	14.52		8.94			16.13		46.30			16.13		150.86		
	EM	5.75	2.05	6.68	12.88		74.11			14.31		29.34			14.31		95.59		
						Total	**83.05**					**75.63**					**246.45**		
Cask Bldg	PT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	RMT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	CE	4.60	1.64	5.34	13.92		64.06			15.46		25.36			15.46		82.64		
	EM	2.88	1.03	3.34	12.88		37.05			14.31		14.67			14.31		47.80		
						Total	**68.96**					**50.72**					**165.28**		
Admin Bldg	PT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	RMT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	CE	4.60	1.64	5.34	13.92		64.06			15.46		25.36			15.46		82.64		
	EM	2.88	1.03	3.34	12.88		37.05			14.31		14.67			14.31		47.80		
						Total	**68.96**					**50.72**					**165.28**		
SNF Pad	PT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	RMT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	EM	5.75	2.05	6.68	12.88		74.11			14.31		29.34			14.31		95.59		
						Total	**79.01**					**54.70**					**178.23**		
Protected Area	HHT	0.15	0.72	2.34	14.52		2.24			16.13		11.57			16.13		37.71		
	EM	5.75	2.05	6.68	12.88		74.11			14.31		29.34			14.31		95.59		
						Total	**76.34**					**40.91**					**133.31**		
Total[5]						26.2	155.35	188	YES		22.80	101.44	196	YES		343.60	674.15	40,000	YES

NOTES:

1. AERMOD ARM2 NOx/NO2 method used to determine 1-hour unit impact.
2. Based on 1-hour NO2 readings of monitoring data - TCEQ El Paso Ascarate Park SE Ambient Monitoring Station, monthly maximum, August 2019
3. Based on 1-hour SO2 readings of monitoring data - TCEQ Big Spring Midway Ambient Monitoring Station, monthly average, August 2019
4. Based on 1-hour CO readings of monitoring data - TCEQ El Paso Ojo De Agua Ambient Monitoring Station, monthly maximum, August 2019
5. Impacts take into account the maximum of General Earthwork, the sum of Cask and Admin Building operations, and the sum of SNF Pad and Protected Area construction.

All Indicated Changes are in response to RAI AQ-4

Table 4.6-1
NAAQS Compliance Demonstration - Phase 1

(5 pages)

3-Hour SO2 NAAQS

Phase	Emissions Source	1-hr SO2 Emission Rate (lb/hr)	SO2 3-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	3-Hour NAAQS (µg/m³)	Meets NAAQS?
Earthwork	HHT	2.87	15.85		45.48		
	EM	2.05	14.14		28.98		
				Total	**74.46**		
Cask Bldg	PT	0.82	15.14		12.41		
	RMT	0.82	15.14		12.41		
	CE	1.64	15.14		24.82		
	EM	1.03	14.14		14.49		
				Total	**49.64**		
Admin Bldg	PT	0.82	15.14		12.41		
	RMT	0.82	15.14		12.41		
	CE	1.64	15.14		24.82		
	EM	1.03	14.14		14.49		
				Total	**49.64**		
SNF Pad	PT	0.82	15.14		12.41		
	RMT	0.82	15.14		12.41		
	EM	2.05	14.14		28.98		
				Total	**53.80**		
Protected Area	HHT	0.72	15.85		11.37		
	EM	2.05	14.14		28.98		
				Total	**40.35**		
Total				22.8	122.09	1,300	YES

NOTE:
1. Based on 1-hour SO2 readings of monitoring data - TCEQ Big Spring Midway Ambient Monitoring Station, monthly average, August 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-1
NAAQS Compliance Demonstration - Phase 1

(5 pages)

8-Hour CO NAAQS

Phase	Emissions Source	1-hr CO Emission Rate (lb/hr)	CO 8-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	8-hr NAAQS (µg/m³)
Earthwork	HHT	9.35	14.95		139.78	
	EM	6.68	13.38		89.40	
				Total	**229.18**	
Cask Bldg	PT	2.67	14.45		38.62	
	RMT	2.67	14.45		38.62	
	CE	5.34	14.45		77.25	
	EM	3.34	13.38		44.70	
				Total	**154.49**	
Admin Bldg	PT	2.67	14.45		38.62	
	RMT	2.67	14.45		38.62	
	CE	5.34	14.45		77.25	
	EM	3.34	13.38		44.70	
				Total	**154.49**	
SNF Pad	PT	2.67	14.45		38.62	
	RMT	2.67	14.45		38.62	
	EM	6.68	13.38		89.40	
				Total	**166.65**	
Protected Area	HHT	2.34	14.95		34.94	
	EM	6.68	13.38		89.40	
				Total	**124.35**	
Total				343.60	652.58	10,000

NOTE:
1. Based on 1-hour CO readings of monitoring data - TCEQ El Paso Ojo De Agua Ambient Monitoring Station, monthly maximum, August 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-1
NAAQS Compliance Demonstration - Phase 1

(5 pages)

24-Hour PM2.5 NAAQS

Phase	Emissions Source	1-hr PM2.5 Emission Rate (lb/hr)	PM2.5 24-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	24-Hour NAAQS (µg/m³)	Meets NAAQS?
General Earthmoving	Excavation	0.40	23.88	Total	9.53		
Total				7.6	17.13	35	YES

NOTE:
1. Based on PM2.5 readings of monitoring data - TCEQ Socorro Hueco Ambient Monitoring Station, monthly average, August 2019

24-Hour PM10 NAAQS

Phase	Emissions Source	1-hr PM10 Emission Rate (lb/hr)	PM10 24-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	24-Hour NAAQS (µg/m³)	Meets NAAQS?
Earthwork	HHT	0.03	11.03		0.34		
	EM	0.07	9.06		0.60		
				Total	**0.94**		
Cask Bldg	PT	0.01	10.34		0.09		
	RMT	0.01	10.34		0.09		
	CE	0.05	10.34		0.54		
	EM	0.03	9.06		0.30		
				Total	**0.73**		
Admin Bldg	PT	0.01	10.34		0.09		
	RMT	0.01	10.34		0.09		
	CE	0.05	10.34		0.54		
	EM	0.03	9.06		0.30		
				Total	**0.73**		
SNF Pad	PT	0.01	10.34		0.09		
	RMT	0.01	10.34		0.09		
	EM	0.07	9.06		0.60		
				Total	**0.78**		
Protected Area	HHT	0.01	11.03		0.09		
	EM	0.07	9.06		0.60		
				Total	**0.68**		
General Earthmoving	Excavation	4.42	23.88		105.53		
				Total	**105.53**		
Total				20	128.44	150	YES

NOTE:
1. Based on PM10 readings of monitoring data - TCEQ El Paso Riverside Ambient Monitoring Station, monthly average, March 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-1
NAAQS Compliance Demonstration - Phase 1

(5 pages)

Annual NO2 and PM2.5 NAAQS

Phase	Emissions Source	1-hr NOx Emission Rate (lb/hr)	NO2 Annual Unit Impact ([µg/m³]/[lb/hr])	Background[1] Concentration (µg/m³)	Annual[2] Impact Ratio (1,725 hours)	Total Annual Impact (µg/m³)	Annual NAAQS (µg/m³)	Meets NAAQS?	1-hr PM2.5 Emission Rate (lb/hr)	PM2.5 Annual Unit Impact ([µg/m³]/[lb/hr])	Background[1] Concentration (µg/m³)	Annual[2] Impact Ratio (1,725 hours)	Total Annual Impact (µg/m³)	Annual NAAQS (µg/m³)	Meets NAAQS?
Earthwork	HHT	0.62	5.68		0.20	0.69									
	EM	5.75	5.00		0.20	5.67									
Cask Bldg	PT	0.18	5.43		0.20	0.19									
	RMT	0.18	5.43		0.20	0.19									
	CE	4.60	5.43		0.20	4.92									
	EM	2.88	5.00		0.20	2.83									
Admin Bldg	PT	0.18	5.43		0.20	0.19									
	RMT	0.18	5.43		0.20	0.19									
	CE	4.60	5.43		0.20	4.92									
	EM	2.88	5.00		0.20	2.83									
SNF Pad	PT	0.18	5.43		0.20	0.19									
	RMT	0.18	5.43		0.20	0.19									
	EM	5.75	5.00		0.20	5.67									
Protected Area	HHT	0.15	5.68		0.20	0.17									
	EM	5.75	5.00		0.20	5.67									
General Earthmoving	Excavation								0.40	10.10		0.20	0.79		
Total				26.2		60.69	100	YES			7.6		8.39	15	YES

NOTES:

1. Background concentrations for annual compliance have been conservatively assumed to be equal to be the same as those of shorter averaging periods.
2. Annual hours of operation are a total of 1,725 hours based on 10 hours per day, 5 days per week, 34.5 weeks of operations. This has been ratioed against 8,760 hours to determine the most appropriate annual impact.

All Indicated Changes are in response to RAI AQ-4

Table 4.6-2
NAAQS Compliance Demonstration - Phases 2-8 and Operations
(4 Pages)

1-Hour NO2, SO2, and CO NAAQS

Phase	Emissions Source	1-hr NOx Emission Rate (lb/hr)	1-hr SO2 Emission Rate (lb/hr)	1-hr CO Emission Rate (lb/hr)	NO2[1] AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	NO2[2] Background Concentration (µg/m³)	NO2 Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?	SO2 AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	SO2[3] Background Concentration (µg/m³)	SO2 Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?	CO AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	CO[4] Background Concentration (µg/m³)	CO Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?
SNF Pad	PT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	RMT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.32		
	EM	5.75	2.05	6.68	12.88		74.11			14.31		29.34			14.31		95.59		
						Total	**79.01**					**54.70**					**178.23**		
Protected	HHT	0.15	0.72	2.34	14.52		2.24			16.13		11.57			16.13		37.71		
Area	EM	5.75	2.05	6.68	12.88		74.11			14.31		29.34			14.31		95.59		
						Total	**76.34**					**40.91**					**133.31**		
Storage Module	RMT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.31		
Construction						**Total**	**2.45**					**12.68**					**41.31**		
Storage Module	MT	2.01	0.72	2.34	14.52		29.24			16.13		11.57			16.13		37.71		
Transport						**Total**	**29.24**					**11.57**					**37.71**		
Total[5]						26.2	181.55	188	YES		22.80	118.41	196	YES		343.60	655.14	40,000	YES

NOTES:
1. AERMOD ARM2 NOx/NO2 method used to determine 1-hour unit impact.
2. Based on 1-hour NO2 readings of monitoring data - TCEQ El Paso Ascarate Park SE Ambient Monitoring Station, monthly maximum, August 2019
3. Based on 1-hour SO2 readings of monitoring data - TCEQ Big Spring Midway Ambient Monitoring Station, monthly average, August 2019
4. Based on 1-hour CO readings of monitoring data - TCEQ El Paso Ojo De Agua Ambient Monitoring Station, monthly maximum, August 2019
5. Impacts take into account the maximum of the sum of the sum of SNF Pad and Protected Area construction and the sum of Storage Module Construction and Transport emissions.

All Indicated Changes are in response to RAI AQ-4

Table 4.6-2
NAAQS Compliance Demonstration - Phases 2-8 and Operations

(4 Pages)

3-Hour SO2 NAAQS

Phase	Emissions Source	1-hr SO2 Emission Rate (lb/hr)	SO2 3-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	3-Hour NAAQS (µg/m³)	Meets NAAQS?
SNF Pad	PT	0.82	15.14		12.41		
	RMT	0.82	15.14		12.41		
	EM	2.05	14.14		28.98		
				Total	**53.80**		
Protected	HHT	0.72	15.85		11.37		
Area	EM	2.05	14.14		28.98		
				Total	**40.35**		
Storage Module	RMT	0.82	15.14		12.41		
Construction				**Total**	**12.41**		
Storage Module	MT	0.72	15.85		11.37		
Transport				**Total**	**11.37**		
Total				22.8	116.95	1,300	YES

NOTE:
1. Based on 1-hour SO2 readings of monitoring data - TCEQ Big Spring Midway Ambient Monitoring Station, monthly average, August 2019

8-Hour CO NAAQS

Phase	Emissions Source	1-hr CO Emission Rate (lb/hr)	CO 8-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	8-hr NAAQS (µg/m³)	Meets NAAQS?
SNF Pad	PT	2.67	14.45		38.62		
	RMT	2.67	14.45		38.62		
	EM	6.68	13.38		89.40		
				Total	**166.65**		
Protected	HHT	2.34	14.95		34.94		
Area	EM	6.68	13.38		89.40		
				Total	**124.35**		
Storage Module	RMT	2.67	14.45		38.62		
Construction				**Total**	**38.62**		
Storage Module	MT	2.34	14.95		34.94		
Transport				**Total**	**34.94**		
Total				343.60	634.59	10,000	YES

NOTE:
1. Based on 1-hour CO readings of monitoring data - TCEQ El Paso Ojo De Agua Ambient Monitoring Station, monthly maximum, August 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-2
NAAQS Compliance Demonstration - Phases 2-8 and Operations

(4 Pages)

24-Hour PM2.5 NAAQS

Phase	Emissions Source	1-hr PM2.5 Emission Rate (lb/hr)	PM2.5 24-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	24-Hour NAAQS (µg/m³)	Meets NAAQS?
General	Excavation	0.01	23.88		0.25		
Earthmoving				**Total**	**0.25**		
Total				7.6	7.85	35	YES

NOTE:
1. Based on PM2.5 readings of monitoring data - TCEQ Socorro Hueco Ambient Monitoring Station, monthly average, August 2019

24-Hour PM10 NAAQS

Phase	Emissions Source	1-hr PM10 Emission Rate (lb/hr)	PM10 24-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	24-Hour NAAQS (µg/m³)	Meets NAAQS?
SNF Pad	PT	0.01	10.34		0.09		
	RMT	0.01	10.34		0.09		
	EM	0.07	9.06		0.60		
				Total	**0.78**		
Protected	HHT	0.01	11.03		0.09		
Area	EM	0.07	9.06		0.60		
				Total	**0.68**		
General	Excavation	0.12	23.88		2.76		
Earthmoving				**Total**	**2.76**		
Storage Module	RMT	0.01	10.34		0.09		
Construction				**Total**	**0.09**		
Storage Module	MT	0.02	11.03		0.25		
Transport				**Total**	**0.25**		
Total				20	24.22	150	YES

NOTE:
1. Based on PM10 readings of monitoring data - TCEQ El Paso Riverside Ambient Monitoring Station, monthly average, March 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-2
NAAQS Compliance Demonstration - Phases 2-8 and Operations

(4 Pages)

Annual NO2 and PM2.5 NAAQS

Phase	Emissions Source	1-hr NOx Emission Rate (lb/hr)	NO2 Annual Unit Impact ([µg/m³]/[lb/hr])	Background[1] Concentration (µg/m³)	Annual[2] Impact Ratio	Total Annual Impact (µg/m³)	Annual NAAQS (µg/m³)	Meets NAAQS?	1-hr PM2.5 Emission Rate (lb/hr)	PM2.5 Annual Unit Impact ([µg/m³]/[lb/hr])	Background[1] Concentration (µg/m³)	Annual[2] Impact Ratio (1,725 hours)	Total Annual Impact (µg/m³)	Annual NAAQS (µg/m³)	Meets NAAQS?
SNF Pad	PT	0.18	5.43		0.20	0.19									
	RMT	0.18	5.43		0.20	0.19									
	EM	5.75	5.00		0.20	5.67									
Protected Area	HHT	0.15	5.68		0.20	0.17									
	EM	5.75	5.00		0.20	5.67									
General Earthmoving	Excavation								0.01	10.10		0.20	0.02		
Storage Module Construction	RMT	0.18	5.43		0.29	0.27									
Storage Module Transport	MT	2.01	5.00		0.29	2.87									
Total				26.2		41.23	100	YES			7.6		7.62	15	YES

NOTES:

1. Background concentrations for annual compliance have been conservatively assumed to be equal to be the same as those of shorter averaging periods.
2. Annual hours of operation are a total of 1,725 and 2,500 hours based on 10 hours per day, 5 days per week, 34.5 weeks of construction and 10 hours per day, 5 days per week, 50 weeks per year of operations. This has been ratioed against 8,760 hours to determine the most appropriate annual impact.

All Indicated Changes are in response to RAI AQ-4

Table 4.6-3
NAAQS Compliance Demonstration – Operations
(3 Pages)

1-Hour NO2, SO2, and CO NAAQS

Phase	Emissions Source	1-hr NOx Emission Rate (lb/hr)	1-hr SO2 Emission Rate (lb/hr)	1-hr CO Emission Rate (lb/hr)	NO2[1] AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	NO2[2] Background Concentration (µg/m³)	NO2 Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?	SO2 AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	SO2[3] Background Concentration (µg/m³)	SO2 Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?	CO AERMOD 1-hour Unit Impact ([µg/m³]/[lb/hr])	CO[4] Background Concentration (µg/m³)	CO Total Impact (µg/m³)	1-hour NAAQS (µg/m³)	Meets NAAQS?
Storage Module	RMT	0.18	0.82	2.67	13.92		2.45			15.46		12.68			15.46		41.31		
Construction						**Total**	**2.45**					**12.68**					**41.31**		
Storage Module	MT	2.01	0.72	2.34	14.52		29.24			16.13		11.57			16.13		37.71		
Transport						**Total**	**29.24**					**11.57**					**37.71**		
Total						26.2	57.89	188	YES		22.80	47.05	196	YES		343.60	422.62	40,000	YES

NOTES:
1. AERMOD ARM2 NOx/NO2 method used to determine 1-hour unit impact.
2. Based on 1-hour NO2 readings of monitoring data - TCEQ El Paso Ascarate Park SE Ambient Monitoring Station, monthly maximum, August 2019
3. Based on 1-hour SO2 readings of monitoring data - TCEQ Big Spring Midway Ambient Monitoring Station, monthly average, August 2019
4. Based on 1-hour CO readings of monitoring data - TCEQ El Paso Ojo De Agua Ambient Monitoring Station, monthly maximum, August 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-3
NAAQS Compliance Demonstration – Operations

(3 Pages)

3-Hour SO2 NAAQS

Phase	Emissions Source	1-hr SO2 Emission Rate (lb/hr)	SO2 3-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	3-Hour NAAQS (µg/m³)	Meets NAAQS?
Storage Module Construction	RMT	0.82	15.14	Total	12.41 **12.41**		
Storage Module Transport	MT	0.72	15.85	Total	11.37 **11.37**		
Total				22.8	46.58	1,300	YES

NOTE:
1. Based on 1-hour SO2 readings of monitoring data - TCEQ Big Spring Midway Ambient Monitoring Station, monthly average, August 2019

8-Hour CO NAAQS

Phase	Emissions Source	1-hr CO Emission Rate (lb/hr)	CO 8-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	8-hr NAAQS (µg/m³)	Meets NAAQS?
Storage Module Construction	RMT	2.67	14.45	Total	38.62 **38.62**		
Storage Module Transport	MT	2.34	14.95	Total	34.94 **34.94**		
Total				343.60	417.17	10,000	YES

NOTE:
1. Based on 1-hour CO readings of monitoring data - TCEQ El Paso Ojo De Agua Ambient Monitoring Station, monthly maximum, August 2019

All Indicated Changes are in response to RAI AQ-4

Table 4.6-3
NAAQS Compliance Demonstration – Operations

(3 Pages)

24-Hour PM10 NAAQS

Phase	Emissions Source	1-hr PM10 Emission Rate (lb/hr)	PM10 24-hr Unit Impact ([µg/m³]/[lb/hr])	Background Concentration [1]	Total Impact (µg/m³)	24-Hour NAAQS (µg/m³)	Meets NAAQS?
Storage Module	RMT	0.01	10.34		0.09		
Construction				Total	0.09		
Storage Module	MT	0.02	11.03		0.25		
Transport				Total	0.25		
Total				20	20.35	150	YES

NOTE:
1. Based on PM10 readings of monitoring data - TCEQ El Paso Riverside Ambient Monitoring Station, monthly average, March 2019

Annual NO2 NAAQS

Phase	Emissions Source	1-hr NOx Emission Rate (lb/hr)	NO2 Annual Unit Impact ([µg/m³]/[lb/hr])	Background [1] Concentration (µg/m³)	Annual [2] Impact Ratio	Total Annual Impact (µg/m³)	Annual NAAQS (µg/m³)	Meets NAAQS?
Storage Module	RMT	0.18	5.43		0.29	0.27		
Construction								
Storage Module	MT	2.01	5.00		0.29	2.87		
Transport								
Total				26.2		29.35	100	YES

NOTES:
1. Background concentrations for annual compliance have been conservatively assumed to be equal to be the same as those of shorter averaging periods.
2. Annual hours of operation are a total of 2,500 hours based on 10 hours per day, 5 days per week, 50 weeks per year of operations. This has been ratioed against 8,760 hours to determine the most appropriate annual impact.

All Indicated Changes are in response to RAI AQ-4

Table 4.6-4
Construction and Operations Emissions - Lifetime Totals

	PHASE 1			PHASE 2		PHASE 3				PHASE 4		PHASE 5		
	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Pollutant	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)
NOx	26.38	0.34	0.34	10.75	0.34	10.75	0.34	0.34	0.34	10.75	0.34	10.75	0.34	0.34
CO	45.59	2.37	2.37	21.14	2.37	21.14	2.37	2.37	2.37	21.14	2.37	21.14	2.37	2.37
SOx	13.99	0.73	0.73	6.49	0.73	6.49	0.73	0.73	0.73	6.49	0.73	6.49	0.73	0.73
PM_{10}	1.36	0.01	0.01	0.20	0.01	0.20	0.01	0.01	0.01	0.20	0.01	0.20	0.01	0.01
$PM_{2.5}$	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2	7,849.33	408.25	408.25	3,639.75	408.25	3,639.75	408.25	408.25	408.25	3,639.75	408.25	3,639.75	408.25	408.25
HAP	0.18	0.01	0.01	0.08	0.01	0.08	0.01	0.01	0.01	0.08	0.01	0.08	0.01	0.01
VOC	16.86	0.88	0.88	7.82	0.88	7.82	0.88	0.88	0.88	7.82	0.88	7.82	0.88	0.88

	PHASE 6		PHASE 7				PHASE 8							
	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
Pollutant	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)
NOx	10.75	0.34	10.75	0.34	0.34	0.34	10.75	0.34	0.34	0.34	0.34	0.34	0.34	0.34
CO	21.14	2.37	21.14	2.37	2.37	2.37	21.14	2.37	2.37	2.37	2.37	2.37	2.37	2.37
SOx	6.49	0.73	6.49	0.73	0.73	0.73	6.49	0.73	0.73	0.73	0.73	0.73	0.73	0.73
PM_{10}	0.20	0.01	0.20	0.01	0.01	0.01	0.20	0.01	0.01	0.01	0.01	0.01	0.01	0.01
$PM_{2.5}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2	3,639.75	408.25	3,639.75	408.25	408.25	408.25	3,639.75	408.25	408.25	408.25	408.25	408.25	408.25	408.25
HAP	0.08	0.01	0.08	0.01	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01
VOC	7.82	0.88	7.82	0.88	0.88	0.88	7.82	0.88	0.88	0.88	0.88	0.88	0.88	0.88

	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061
Pollutant	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)	Annual Emissions (tpy)
NOx	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
CO	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
SOx	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
PM_{10}	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
$PM_{2.5}$	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CO_2	408.25	408.25	408.25	408.25	408.25	408.25	408.25	408.25	408.25	408.25	408.25	408.25	408.25
HAP	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
VOC	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88

All Indicated Changes are in response to RAI AQ-4

RAI AQ-5

Characterize the peak year emission levels. Consideration should be given, but not limited, to the following:

- Overlap of the various stages (i.e., construction, operation, and decommissioning) within the framework of the planned eight phases.
- Distinctions in construction emission levels between Phase 1 and subsequent phases.
- Individual pollutants other than just particulate matter (e.g., other criteria pollutants, volatile organic compounds, non-radiological hazardous air pollutants) because the peak year for particulate matter could be different than the peak year for other pollutants.
- Complete range of emission sources and activities associated with the proposed action (see RAI AQ-4).
- Provide estimated emission levels (e.g., tons per year) for the activities and sources associated with the proposed CISF accounting for the various topics raised in the previous bullet points specified in this RAI (i.e., individual stages, overlapping of stages and phases, pollutants other than particulate matter PM10, range of emission levels) or provide a basis for not providing any aspects of this information.

ER Section 1.3.2.3 identifies that both the construction and the operation activities generate air emissions. ER Section 4.5.3 states that the CISF could be built in eight phases and indicates that this phased approach means that construction and operation activities could overlap at times. ER Section 4.5.3 also indicates that the first phase would also include site infrastructure construction (e.g., facilities, the railroad side track, possibly a new concrete batch plant). The air impact analysis in ER Section 4.6 (i) does not clearly identify the proposed action's highest annual or peak year emissions considering the possible overlap of stages (i.e., construction, operation, and decommissioning) or phases as well as the distinction in construction emission levels between Phase 1 and the subsequent phases, (ii) only considers particulate matter, (iii) does not consider combustion emissions from mobile sources, and (iv) only provides estimated annual emission levels for the concrete batch plant (note that these emission level estimates in ER Table 4.6.2 do not specify units). The EIS analyses need to consider the peak year emission levels since this relates to the largest potential impacts from the proposed action.

This information is needed in accordance with 10 CFR 51.45(b)(1), which requires that the ER include a description of the proposed action and its potential impacts on the environment.

Response to RAI AQ-5:

Emission estimates have been developed for construction and operations activities at the CISF and may be found in Tables 1-9 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx included as an Enclosure referenced in RAI Response AQ-4. Emissions are broken down by equipment/activity type and are based on the construction phase and operations year.

The majority of emissions associated with the CISF are estimated to take place during the initial construction phase (Phase 1) and will constitute the project's "peak year" emissions (Table 7 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx). Phase 1 construction is expected to begin in 2021. Each subsequent construction phase is expected to have the same level of emissions and will take place approximately every 2 to 3 years starting in 2024. Operations emissions are expected to remain the same from year to year (Table 8 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx) and will overlap construction Phases 2-8 (Table 9 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx). Figure AQ-5-1 illustrates emission estimates by pollutant for each phase of construction with the exception of CO_2, which is included in Table 7 of Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx.

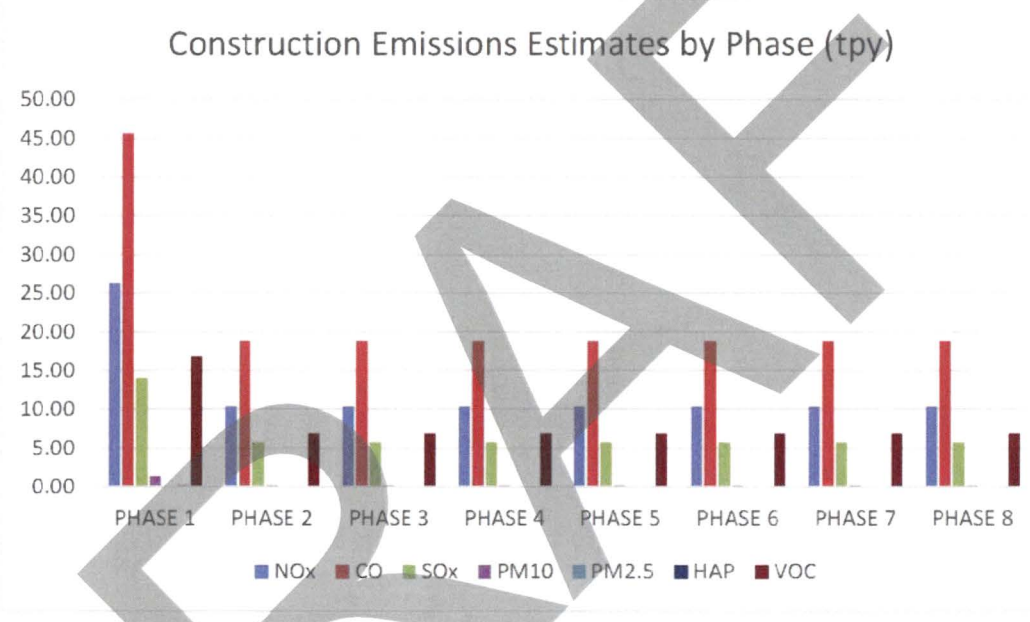


Figure AQ-5-1
Emission Estimates by Pollutant for Each Phase of Construction for the CISF

Decommissioning emissions will be negligible. Facilities will be surveyed, decontaminated if necessary, and abandoned in place.

Impact:

No change as a result of this RAI.

RAI AQ-6

Provide a greater level of detail for the site-specific air dispersion modeling. Examples of additional information to provide include, but are not limited to, the following:

- Estimated emission levels for the various pollutants generated by the proposed CISF activities that were used as input for the air dispersion modeling.
- Details about the emission inventory assumptions, inputs, and calculations (e.g., types and number of emission sources, horsepower, load factors, and emission factors).
- Baseline ambient air concentrations.
- Air dispersion modeling results, which allow for comparison to the various National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) thresholds.
- Basis for why the air dispersion modeling did not include (i) pollutants other than particulate matter PM10, and (ii) sources other than fugitive dust from construction.
- Identify who conducted the air dispersion modeling and when it was conducted.

ER Sections 4.2.1 and 4.6 state that air dispersion modeling was conducted to assess impacts of the proposed CISF. However, information in the ER concerning the modeling input is limited and did not include the emission inventory used as input for the modeling. ER Section 4.6 stated that construction stage particulate matter PM10 emission were below the NAAQS. However, the analyses in the ER did not (i) provide the actual modeling results, (ii) compare the results to PSD thresholds, (iii) provide baseline ambient pollutant concentrations for inclusion in the NAAQS assessment, or (iv) explain why the air dispersion modeling was limited to the particulate matter PM10 emissions from fugitive dust from the construction stage. The requested detailed information provides a basis for characterizing the quality of the air dispersion modeling results.

This information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI AQ-6:

Air quality dispersion modeling was conducted for construction and operations at the proposed CISF using the Environmental Protection Agency's (EPA's) AERMOD modeling system (version 15181), details for which can be found in the User's Guide for the AMS/EPA Regulatory Model (AERMOD) [1]. A general purpose meteorological preprocessor, the EPA's AERMET preprocessor (version 16216), was used to enter available meteorological data into a format suitable for AERMOD. The User's Guide for the AERMOD Meteorological Preprocessor (AERMET) [2] provides instructions for setting up and running the AERMET preprocessor.

The dispersion calculations are based on emission estimates generated in the spreadsheet included in ISP Response to RAI AQ-4. Each criteria pollutant was evaluated and compared to its respective National Ambient Air Quality Standard (NAAQS) for each pollutant's respective averaging period. Each source was evaluated using AERMOD version 15181 and AERMET version 16216 as previously discussed. Meteorological data for Andrews County, Texas, from the TCEQ was pre-processed in AERMET and used in the AERMOD model. Due to the relatively flat terrain associated with the proposed CISF, the model employed flat terrain for receptors and low wind speeds in AERMET for low-level sources.

On-road and non-road sources were evaluated as point sources using a 1 lb/hr basis to create a unit impact multiplier in units of (µg/m³)/(lb/hr), to which estimated emissions were applied. Each point source used similar stack parameters and varying exit velocities based on engine horsepower. Emissions of nitrogen oxides (NO_x) were converted to nitrogen dioxide (NO_2) using EPA's Ambient Ratio Method 2 (ARM2) with a minimum of 0.5 and a maximum of 0.9. Emissions of sulfur oxides (SO_x) assumed a full conversion to SO_2. Since AP-42, the EPA's Compilation of Air Pollutant Emission Factors (EPA, 1995) does not provide diesel engine emission factor values for $PM_{2.5}$, only PM_{10} was evaluated for point sources.

Fugitive dust sources relating to earthmoving activities at the site were evaluated as volume sources using a 1 lb/hr basis to create a unit impact multiplier in units of (µg/m³)/(lb/hr), to which estimated emissions were applied. It is assumed that, in one hour, an area of approximately 417.5 feet by 20.5 feet of earth will be moved. Using these dimensions and the dimensions of the earthmoving equipment as a basis, a series of volume sources were developed, and the 1 lb/hr emission rate was divided evenly among these sources to determine the hourly impacts. Emissions of PM_{10} and $PM_{2.5}$ were evaluated for fugitive sources.

Background concentrations for each pollutant were determined using the most recently available data at the nearest air quality monitoring stations to the proposed CISF. Air monitors used for this evaluation include those that are part of the Texas Air Monitoring Information System (TAMIS) and are based in Odessa, Big Spring, Socorro, and El Paso, Texas.

Based on the modeled impacts of the construction and operations phases at the proposed CISF, it was determined that NAAQS have been met for each criteria pollutant for their respective averaging periods. Compliance with NAAQS is demonstrated in the spreadsheet included in ISP Response to RAI AQ-4.

Since the emissions from the construction and operations phases of the proposed CISF are not expected to achieve major source thresholds and are located in an area in attainment with NAAQS, an evaluation of the impacts from this project was not conducted with regard to Prevention of Significant Deterioration (PSD) requirements as it will not trigger said requirements.

ER Sections 3.6.9 and 4.2.1 were updated to provide reference to sections that reflect this discussion.

References:

1. EPA (2018) (Environmental Protection Agency), "User's Guide for the AMS/EPA Regulatory Model (AERMOD)," EPA-454/B-18-001, April 2018. Available from: www.epa.gov/scram/air-quality-dispersion-modeling-preferred-and-recommended-models#aermod

1. EPA (2018) (Environmental Protection Agency), "User's Guide for the AERMOD Meteorological Preprocessor (AERMET)," EPA-454/B-18-001, April 2018. Available from: www.epa.gov/scram/meteorological-processors-and-accessory-programs#aermet

Impact:

ER Sections 3.6.9 and 4.2.1 have been revised as described in the response.

Table 3.6-6, Average Morning and Afternoon Mixing Heights for Midland-Odessa, Texas

	Winter	Spring	Summer	Fall	Annual
Morning	290 meters (951 feet)	429 meters (1,407 feet)	606 meters (1,988 feet)	419 meters (1,375 feet)	436 meters (1,430 feet)
Afternoon	1,276 meters (4,186 feet)	2,449 meters (8,035 feet)	2,744 meters (9,003 feet)	1,887 meters (6,191 feet)	2,089 meters (6,854 feet)

Source: (Holzworth, 1972)

3.6.9 Diffusion Estimates

This section is reproduced from WCS CSIF SAR Section A.11.3.4, "Atmospheric Dispersion Coefficients."

For normal and off-normal conditions, an atmospheric dispersion coefficient is calculated using D-stability and a wind speed of 5 m/sec and a 100 m (328 ft) distance to the controlled area boundary. The controlled area boundary is more than 100 m (328 ft) from the WCS CISF, so use of 100 m (328 ft) is conservative. For accident conditions, a dispersion coefficient is calculated using F-stability and a wind speed of 1 m/sec. These atmospheric conditions are consistent with the guidance of NUREG-1536 and NUREG-1567. The smallest vertical plane cross-sectional area of one horizontal storage module (HSM) is conservatively used as the vertical plane cross-sectional area of the building: area = HSM Width * HSM Height = 9 ft 8 in x 15 in = 20,880 in^2 = 13.47 m^2.

The atmospheric dispersion coefficients can be determined through selective use of Equations 1, 2, and 3 of Regulatory Guide 1.145 for ground-level relative concentrations at the plume centerline. For D-stability, 5 m/sec wind speed and a distance of 100 m (328 ft), the horizontal dispersion coefficient, σ_y, is 8 m per Figure 1 of (NRC, 1982). The vertical dispersion coefficient, σ_z, is 4.6 m per Figure 2 of (NRC, 1982). The correction factor at these conditions is determined to be 1.122 per Figure 3 of (NRC, 1982).

For F-stability, 1 m/sec wind speed and a distance of 100 m, the horizontal dispersion coefficient, σ_y, is 4 m per Figure 1 of (NRC, 1982). The vertical dispersion coefficient, σ_z, is 2.3

No additional construction access roadways off of Texas State Highway 176 would be required to support construction. The materials delivery and construction worker access road would run north off of Texas State Highway 176 along the west side of the existing LLRW site. These roadways would eventually be converted to permanent access roads upon completion of construction. Therefore, impacts from new access road construction would be minimized.

4.2.1 Facility Construction Impacts

Impacts from construction transportation would include the generation of fugitive dust, changes in scenic quality, and added noise. Dust would be generated to some degree during the various stages of construction activity. The amount of dust emissions would vary according to the types of activity. The first 12 months of construction would likely be the period of highest emissions since approximately 63 ha (155 acres) would be involved, along with the greatest number of construction vehicles operating on an unprepared surface. However, it is expected that no more than 20 ha (50 acres) would be involved in this type of work at any one time.

RAI AQ-6

See ER Section 4.6 for air quality impacts from construction.

4.2.1.1 Scenic Views

RAI PA-2 and RAI AQ-6

Although CISF construction would substantially alter the natural state of the landscape, impacts to scenic views are not considered to be significant, based on the absence of high quality scenic views in the area and the presence of currently developed industrial land uses on surrounding properties substantial. Construction vehicles would be comparable to trucks servicing neighboring facilities in terms of their impact on the scenic views.

During decommissioning, the site would be decommissioned to levels that would allow for the unrestricted release of the CISF pursuant to 10 CFR 20, Subpart E. Accordingly, the impact to scenic views during decommissioning would be small.

RAI AQ-7

Revise the air quality impact analyses as appropriate to address the following:

- The entire range of emission sources associated with the proposed action as described in RAI AQ-4.
- The peak year emission levels as described in RAI AQ-5.
- Pollutants other than particulate matter PM10 (e.g., other criteria pollutants, volatile organic compounds, non-radiological hazardous pollutants).

ER Section 1.3.2.3 identifies two primary types of air emissions associated with the proposed action: combustion emissions from construction equipment and fugitive dust from excavation activities and construction equipment. However, the air quality impact analyses in ER Section 4.6 is limited to fugitive dust. The EIS impact analyses need to consider the entire range of emission sources (see RAI AQ-4), the peak year emission levels (see RAI AQ-5), as well as the entire range of pollutants generated by the proposed CISF to accurately characterize the air quality impacts. If additional air dispersion modeling is conducted in response to this RAI, consideration should be given to the information requests in RAI AQ-6 associated with the existing air dispersion modeling.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the proposed action and discuss the impacts of the proposed action.

Response to RAI AQ-7:

Emission estimates for the construction and operational phases of the proposed CISF have been quantified and may be found in the spreadsheet included in the ISP response to RAI AQ-4. Emission factors are adopted from the EPA's AP-42 [1], Chapter 3.3, "Gasoline and Diesel Industrial Engines" and Chapter 11.9, "Western Surface Coal Mining." Emissions estimated include those of the combustion products from equipment and vehicles and fugitive particulate matter from earthmoving during construction and operations.

As presented in the ISP response to RAI AQ-5, the majority of emissions associated with the proposed CISF are estimated to take place during the initial construction phase (Phase 1) and will constitute the project's peak year emissions.

References:

1. EPA (Environmental Protection Agency), "Compilation of Air Pollutant Emission Factors, Volume 1, Stationary Point and Area Sources, Fifth Edition AP-42, January 1995.

Impact:

No change as a result of this RAI.

RAI AQ-8

Provide a technical basis for the assumption of a 50-percent reduction in emissions from dust suppression, given that various factors influencing the level of dust suppression activities are yet to be determined (e.g., identifying the specific mitigation measures that would be implemented). If a different efficiency value is warranted, then specify the value, provide a basis, and revise the emission inventory and impact analyses accordingly.

ER Section 4.6 states that the air emission inventory used for assessing impacts assumes a 50-percent reduction in fugitive dust emissions for dust suppression activities. However, the ER does not identify the actual, specific mitigation measure that would be implemented or the basis for the using this 50 percent value. Other ER text identifies several factors that influence the level of dust suppression activities: water conservation (see ER Section 4.2.3), possible requirements from an air permit, which has not yet been obtained (see ER Section 1.3.2.3), and implementation of a Best Management Emission Control Plan, which has not yet been developed (see ER Section 1.3.2.3). Providing a basis for the effectiveness of the dust suppression mitigation allows for an accurate characterization of the air emissions and associated impacts.

This additional information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI AQ-8:

Surfaces throughout the proposed CISF will be watered in regular intervals to reduce fugitive dust emissions during the construction phase of the project. TCEQ's emission calculation workbook for rock crushing plants [1], allows regulated entities to claim a 50% reduction in emissions for "wet material." Since the fugitive dust that is expected to be emitted at the site is similar to the fugitive dust at similar plants around the state of Texas that adhere to this calculation methodology, it is an appropriate reduction to apply to fugitive dust emissions at the site. ER Section 4.2.3 has been revised to reflect this discussion and for consistency with ISP response to RAI PA-2.

References:

1. TCEQ (Texas Commission on Environmental Quality), "Rock Crushing Facility Emission Rate Calculation Worksheet" [Microsoft Excel spreadsheet], APDG6490v1 (Version 1.0), Last updated February 19, 2019. Available from: https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

Impact:

ER Section 4.2.3 has been revised as described in the response.

4.2.3 Mitigation Measures

To control fugitive dust production, reasonable precautions would be taken to prevent PM and/or suspended PM from becoming airborne. When necessary, water would be used to control dust on dirt roads, in clearing and grading operations, and during construction activities. Water conservation would be considered *for activities which are not essential to* dust suppression. See Section 4.4 for a discussion of water conservation measures. Mitigation measures would not be required during operations or decommissioning of the CISF.

RAI AQ-8

RAI AQ-8

RAI PA-2 and RAI AQ-8

4.2.4 Radioactive Material Transportation Impacts

Over the course of the 20-year operational life of the CISF, ISP would receive up to 40,000 MTUs of SNF and related GTCC waste from decommissioned commercial nuclear reactor sites and operating reactors. SNF would be transported exclusively by rail. All SNF would be transported approximately 169 km (105 mi) from Monahans, Texas to the CISF along the transportation corridor.

The DOE or nuclear plant owner(s) holding title to the SNF will be responsible for transporting SNF from existing nuclear power plants to the CISF by rail in transportation casks licensed by the NRC pursuant to 10 CFR 71. The preparation of such shipments will be conducted in accordance with written procedures prepared by the commercial nuclear power plant, the DOE, or their contractors. The DOE or private qualified logistics company will also be responsible for coordinating with federal agencies, such as the U.S. Department of Transportation, U.S. Department of Homeland Security, U.S. Environmental Protection Agency, and the Federal Emergency Management Agency, regarding transportation of SNF from the commercial nuclear reactor sites to the CISF.

If the DOE is the shipper, the federal government, through DOE, is responsible for providing emergency training to states, tribes, and local emergency responders along the transportation routes where SNF would be transported to the CISF. ISP joint venture member Waste Control Specialists has acquired considerable experience in responding to the potential transportation events given its relative proximity to the Waste Isolation Pilot Plant. Local fire fighters, law enforcement, and emergency medical staff have been trained to respond to put out fires and organizing any emergency response actions that may be needed to reduce the severity of events related to transportation incidents involving SNF.

CLIMATE CHANGE (CC)

RAI CC-1

Address the following aspects of climate change and the proposed action's greenhouse gas emissions:

- Describe any relevant regional, state, or local goals or laws that address climate change.
- Characterize the proposed action's greenhouse gas emission levels from stationary, mobile (e.g., onsite, local, and national), and indirect sources.
- Disclose whether any mitigation, project design, or adaptation measures will be implemented to address greenhouse gas emissions from the proposed action.
- Describe any areas where the environmental impacts of climate change overlap with the environmental impacts of the proposed action (e.g., water usage and availability).

The discussion of greenhouse gas emissions is limited to text in ER Section 8.5, citing NUREG–2157, and states that the proposed action's emission would be small but would add to the overall atmospheric burden of emissions that could contribute to potential long term impacts (NRC, 2014). The EIS needs to address the project's greenhouse gas emissions and the potential overlap of environmental impacts from climate change and the storage of SNF at the WCS site.

This additional information is needed in accordance with 10 CFR 51.45(b) through (d), which require that the ER include: a description of the proposed action and the environment affected; a discussion of the impacts of the proposed action; sufficient data to aid the NRC in its development of an independent analysis; and a description of the status of compliance with applicable environmental quality standards and requirements, including limitations and requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.

Response to RAI CC-1:

On January 2, 2011, EPA began requiring sites that are major sources of Greenhouse Gases (GHGs) to obtain permits under federal Title V and Prevention of Significant Deterioration (PSD) rules, which the State of Texas adopted in adopted in Title 30 Texas Administrative Code (TAC), Chapter 116, Subchapter B, Division 6. The threshold for being considered a major source of GHGs is 75,000 tons per year (tpy) of carbon dioxide (CO_2) equivalents (CO_{2e}), as outlined in 30 TAC § 116.164. On June 23, 2014, the United States Supreme Court held in Utility Air Regulatory Group v. EPA, 573 U.S. 302(2014), that sites cannot be compelled to obtain such permits unless other pollutants that are regulated trigger such major source permitting as well, invalidating the existing "Tailoring Rule" that EPA had developed for evaluating sources for GHG PSD applicability based on GHGs alone. The proposed CISF does not exceed major source thresholds for GHGs or other regulated pollutants and is therefore not subject to such rules. ISP is not aware of any local GHG laws or rules.

The Greenhouse Gas Reporting Program (GHGRP) is an annual reporting program of the EPA promulgated under 40 CFR Part 98. Sources of GHG emissions that exceed 25,000 metric tons (mt) of CO_{2e} are required to report their actual emissions of GHGs annually to the EPA. Since the proposed CISF does not exceed the 25,000 mt CO_{2e} reporting threshold, rules promulgated under 40 CFR Part 98 do not apply to the CISF site and reporting is not required.

Emission estimates of the GHG CO_2 have been quantified for construction and operations at the CISF site. Peak CO_2 emissions are estimated to occur during Phase 1 of the construction process and are not expected to exceed 7,849.33 tpy, well below the threshold of 75,000 tpy CO_{2e}. Emission estimates are based on factors found in EPA's AP-42 Chapter 3.3, and may be found in Excel™ Spreadsheet T190815_EMISSIONS ESTIMATES.xlsx included in RAI Response AQ-4. Emissions of GHGs are considered to be a minimal contribution to the overall emissions of the site, and existing engine manufacturer design and controls provide sufficient reductions to minimize emissions. Therefore, no further mitigation, project design, or adaptation measures are included with this project, and no significant overlap with climate change impacts is expected from a GHG emissions perspective.

ER Section 8.5 has been updated to incorporate the above discussion about GHGs and to point to ER Section 4.6 for emission estimates based on factors found in EPA's AP-42 Chapter 3.3.

References:

1. EPA (Environmental Protection Agency)," Compilation of Air Pollutant Emission Factors," Volume 1, Stationary Point and Area Sources, Fifth Edition AP-42, January 1995.

2. Federal Register, "Greenhouse Gas Reporting Rule," EPA 40 CFR Part 98, October 22, 2015.

Impact:

ER Section 8.5 has been revised as described in the response.

Though greenhouse gas emissions of the CISF proposal would be very small, those emissions could contribute to long-term impacts associated with climate change (NRC, 2013). *Emission estimates of the greenhouse gas (GHG) carbon dioxide (CO_2) have been quantified for construction and operations at the CISF site. Peak CO_2 emissions are estimated to occur during Phase 1 of the construction process and are not expected to exceed 7,849.33 tpy, well below the threshold of 75,000 tpy CO_{2e}. Emissions of GHGs are considered to be a minimal contribution to the overall emissions of the site, and therefore no mitigation, project design, or adaptation measures are included with this project as existing engine manufacturer design and controls provide sufficient reductions to minimize emissions. Emission estimates are based on factors found in EPA's AP-42 Chapter 3.3 and may be found in ER Section 4.6.*

All Indicated Changes are in response to RAI CC-1

NOISE (NOI)

RAI NOI-1

Provide current information on measured background or ambient noise levels at the proposed CISF.

ER Sections 3.7.1 and 4.7.3 provide information on background noise levels at the neighoring URENCO facility measured in September 2003. In ER Section 4.7.3, ISP assumes that the measured September 2003 background noise levels at URENCO would be similar to current background noise levels at the proposed ISP CISF. Current site-specific information on background noise levels is necessary to describe the affected environment and establish background/ambient (baseline) conditions of the site so that the NRC staff can evaluate the impacts of construction and operation of the proposed CISF.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which require that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI NOI-1:

ISP performed an acoustical analysis of the background sound levels in July of 2019 in areas surrounding the proposed CISF. Measurements were taken at and around the existing Waste Control Specialists facility and in and around the city of Eunice, NM. Roadway traffic is the primary noise contributor at all locations monitored.

In general it was found that the Noise Sensitive Areas (NSA) in Eunice, NM, which are nearest to the proposed CISF are also very near to highways NM 176 and NM 18, as well as the gas plant located on the south side of the city. These Eunice NSA measurements possess elevated background levels above L_{dn} 55. At the current northeast corner of Eunice, NM, sound levels are more moderate. The EPA's 1974 recommendation for residential communities is L_{dn} 55. Sounds originating at the CISF are unlikely to be audible in Eunice and are not expected to exceed the EPA's recommended guideline.

NSAs along the western Waste Control Specialists property line are in the 30s and 40s L_{dn}. Construction is likely to be generally audible at these locations. Operations at the CISF are expected to only be audible from time to time. The EPA's 1974 recommendation for industrial sites, as well as for "Farm Land and General Unpopulated Land" is L_{dn} 70. Sounds originating at the CISF are not expected to exceed the EPA's recommended guideline.

ER Sections 3.7.1 and 4.7.2 and 4.7.3 have been revised to include the above information. Section 9 has also been updated to include add: Nelson Acoustics. (2019). "Noise Assessment for ISP CISF," Austin, TX as a reference document for the ER.

References:

1. Nelson Acoustics, "Noise Assessment for ISP CISF," Austin, TX, 2019.

Impact:

ER Sections 3.7.1, 4.7.2, 4.7.3 and 9.0 have been revised as described in the response.

Because the nighttime noise levels are significantly lower than the daytime noise levels, the daytime L_{eq} is used alone, without averaging the lower nighttime value, to provide a more conservative representation of the actual exposure.

Measurements were made at the nearby NEF in New Mexico in September 2003 during the development of that facility. The results of those measurements showed higher noise levels resulting from vehicle traffic near New Mexico Highway 234, which is an extension of Texas State Highway 176, particularly heavy-duty tractor-trailer trucks. Other noise sources were low-flying aircraft operating out of the Eunice Airport and sudden high wind gusts. Average background noise levels ranged from 40.1 to 50.4 dBA. These noise levels are considered moderate, and are below the average range of speech, which ranges from 48 to 72 dBA (HUD, 1985).

ISP performed an acoustical analysis of the background sound levels in July of 2019 (Nelson Acoustics, 2019) in areas surrounding the proposed ISP CISF. Measurements were taken at and around the existing WCS facility and in and around the city of Eunice, NM. Roadway traffic is the primary noise contributor at all locations monitored.

In general it is found that the Noise Sensitive Areas (NSA) in Eunice, NM which are nearest to the proposed CISF are also very near to highways NM 176 and NM 18 as well as the Gas Plant located on the south side of the city. These Eunice NSA measurements possess elevated background levels above L_{dn} 55. At the current northeast corner of Eunice, NM, sound levels are more moderate. The EPA's 1974 recommendation for residential communities is L_{dn} 55. Sounds originating at the CISF are unlikely to be audible in Eunice and are not expected to exceed the EPA's recommended guideline.

NSAs along the western WCS property line are in the 30s and 40s L_{dn}. Construction is likely to be generally audible at these locations. Operations at the CISF are expected to be only audible from time to time. The EPA's 1974 recommendation for industrial sites, as well as for "Farm Land and General Unpopulated Land" is L_{dn} 70. Sounds originating at the CISF are not expected to exceed the EPA's recommended guideline.

3.7.2 Community Distribution

The area immediately surrounding the proposed CISF is unpopulated and used primarily for disposal of various waste products, for mining, and for intermittent cattle grazing. The nearest

All Indicated Changes are in response to RAI NOI-1

4.7.2 Potential Impacts

ISP performed an acoustical analysis of the background sound levels in July of 2019 (Nelson Acoustics, 2019) in areas surrounding the proposed CISF. Measurements were taken at and around the existing WCS facility and in and around the city of Eunice, NM. Roadway traffic is the primary noise contributor at all locations monitored.

In general it is found that the NSAs in Eunice, NM which are nearest to the proposed CISF are also very near to highways NM 176 and NM 18 as well as the Gas Plant located on the south side of the city. These Eunice NSA measurements possess elevated background levels above L_{dn} 55. At the current northeast corner of Eunice, NM, sound levels are more moderate. The EPA's 1974 recommendation for residential communities is L_{dn} 55. Sounds originating at the CISF are unlikely to be audible in Eunice and are not expected to exceed the EPA's recommended guideline.

Noise impacts resulting from the temporary increase in noise levels along Texas State Highway 176 due to construction vehicles are not expected to impact nearby receptors significantly. Noise from truck traffic already using the road is currently substantially louder than would be caused by the incremental increase in traffic related to the construction and operation of the CISF. The nearest commercial noise receptors are four businesses located within a 2.4 km (1.5-mi) radius of the proposed site. These four businesses are URENCO to the west just over the New Mexico border; Lea County Landfill, located to the southeast; Sundance Services, Inc.and Permian Basin Materials, located to the north. Potential impacts to local schools, churches, hospitals, and residences are not expected to be significant. The nearest residential noise receptor is located west of the site at a distance of approximately 4.3 km (2.63 mi). Due to its distance from the proposed CISF site, the residential receptor is not expected to perceive an increase in noise levels due to operational noise levels. The nearest school, hospital, church, and other sensitive noise receptors are located even farther away, thereby allowing the noise to dissipate and be absorbed, helping decrease the sound levels even further. Homes located near the construction traffic at the intersection of New Mexico Highway 234 and New Mexico Highway 18 would be affected by the vehicle noise, but due to existing heavy tractor trailer vehicle traffic, the change is expected to be minimal. No schools or hospitals are located at this intersection.

4.7.3 Cumulative Noise Impacts

ISP conducted background noise-level survey at four locations on and along the boundaries of the existing Waste Control Specialists facility and proposed CISF site on July 25-26, 2019 (Nelson Acoustics, 2019). The measured background noise levels at these locations ranged from between 36.3 and 40.7 decibels A-weighted, represent the nearest receptor locations for the general public.

Cumulative impacts from all site noise sources should be small and typically remain at or below HUD guidelines of 65 dBA L_d, and the EPA guidelines of 55 dBA L_{dn} during CISF construction, operation, and decommissioning. Residences closest to the site boundary would experience only minor impacts from construction noise, with the majority of the noise sources being from additional construction vehicle traffic. Since phases of construction include a variety of activities, there may be short-term occasions when higher noise levels would be present; examples include the use of backhoes and large generators.

The level of noise anticipated offsite is comparable to noise levels near a busy road and less than noise levels found in most city neighborhoods. Expected noise levels would mostly affect an area within a 1.6 km (1 mile) radius of the proposed CISF site. The cumulative noise of all site activities should have a minor impact and only on those receptors closest to the site boundary.

4.8 HISTORIC AND CULTURAL RESOURCE IMPACTS

Historic resources include buildings, structures, objects, and non-archaeological sites and districts that are important in the history of a community, a region, a state, or the nation. The NRC regulates the proposed licensing activities; therefore, the project is subject to Section 106 of the NHPA.

The APE for direct impacts is the project footprint. Taking into consideration the height of the crane that would be required, the height of the potential aboveground facility, and the relatively flat surrounding terrain, the APE for indirect/visual impacts is a 1.6 km (1 mi) radius from the proposed project footprint. The direct effects APE is contained entirely within the state of Texas, while the indirect effects APE extends into New Mexico.

Mullican, W. I. (1997). Playas and Recharge of the Ogallala Aquifer on the Southern High Plains of Texas-An Examination Using Numerical Techniques: The University of Texas at Austin, Bureau of Economic Geology Report of Investigations No. 242, p. 72.

NAC International, Inc. (2015) WCS Scoping Evaluation.

NAS. (1999). (National Academy of Sciences). Committee on Health Risks of Exposure to Radon. (BEIR VI). Washington, DC: National Academies Press.

National Environmental Policy Act of 1969. (n.d.).

National Historic Preservation Act of 1966. (n.d.).

National Research Council. (2006). Committee on the Biological Effects of Ionizing Radiation, (BEIR VII). Washington, D.C: National Academies Press.

Nativ, R. and G.N. Gutierrez. (1988). Hydrochemistry of Cretaceous Aquifers, Texas Panhandle and Eastern New Mexico: The University of Texas at Austin, Bureau of Economic Geology Geological Circular 88-3, p. 32.

Nativ, R. (1988). Hydrogeology and Hydrochemistry of the Ogallala Aquifer, Southern High Plains, Texas Panhandle and Eastern New Mexico: The University of Texas at Austin, Bureau of Economic Geology Report of Investigations No. 177, p. 64.

NBS. (1959). (National Bureau of Standards). Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure. U.S. Department of Commerce. National Bureau of Standards Handbook 69.

NCI. (2012). (National Cancer Institute). No Excuses Mortality Risk Found in Countries with Nuclear Facilities-Fact Sheet. U.S. Department of Health and Human Services, National Institute of Health. Available at: http://dceg.cancer.gov/about/organization/programs-ebp/reb/fact-sheet-mortality-risk.

NCRP. (2009). (National Council on Radiation Protection and Measures). Ionizing Radiation Exposure of the Population of the United States. NCRP Report 160.

NEF. (2005). National Enrichment Facility. URENCO Environmental Report. Published in April 2005.

Nelson Acoustics. (2019). Noise Assessment for ISP CISF, Austin, TX.

Nicholson, A., Jr., and A. Clebsch, Jr. (1961). Geology and Ground-Water Conditions in Southern Lea County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Ground-Water Report 6, Socorro, New Mexico, p. 123.

All Indicated Changes are in response to RAI NOI-1

RAI NOI-2

Provide estimates of peak noise levels that would be generated during construction and operation of the proposed CISF, for example, estimates of peak noise levels generated by vehicular and rail traffic, construction and operational equipment, and ancillary activities such as operation of the concrete batch plant.

ER Section 4.7.1 concludes that, "(p)redicted noise levels, background noise levels, calculated construction noise levels, and operational noise levels should typically be well below both HUD and Environmental Protection Agency (EPA) guidelines." However, the ER should estimate peak noise levels that would be generated during construction and operation of the proposed CISF to support this conclusion. Estimates of peak noise levels generated during construction and operation are needed to support the NRC staff's evaluation of potential noise impacts to offsite and onsite receptors.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI NOI-2:

ISP performed an acoustical analysis of the background sound levels in July of 2019 in areas surrounding the proposed CISF [1]. This formed the basis for determining estimates of noise levels that would be generated during construction and operation at the proposed CISF. Estimates were performed for nine noise-sensitive areas (NSA) around the proposed CISF and the city of Eunice, NM. New ER Figures 4.7-1 and 4.7-2 have been added to provide the locations for each of the NSAs.

Equipment types and counts were based on the types and quantity of equipment used for the air quality evaluation performed in the ISP Response to RAI AQ-5. Additional noise sources related to mechanical equipment associated with the CISF Security and Administration Building and the Cask Handling Building. In addition, noise from vehicle backup alarms were added (Reference [1]).

A-weighted sound power level and temporal usage factors for construction vehicles were obtained from the Federal Highway Administration's Road Construction Model [2]. Typical construction octave band spectral shapes and Sound Power Levels for other equipment were obtained from various resources as stated in the report [1]. Noise emission levels from the Waste Control Specialists locomotive were extracted from direct measurements performed during the site visit. Factors for geometric divergence and excess attenuation due to air and ground absorption were computed in accordance with ISO 9613-2 [3], then applied to yield sound pressure level estimates. No credit was taken for intervening terrain or material stockpiles that could further reduce offsite levels since occasional weather conditions can cause these barriers to be bypassed.

During construction, increased sound levels may be noticeable from directly neighboring facilities (URENCO, Sundance Services, and Permian Basin Materials), especially during Phase 1 construction. During operation of the facility, the nominal average sound levels increase primarily due to the potential of the passage of an additional train per day. The day-night average sound level, L_{dn}, which is the average noise level over a 24-hour period, for construction and operation is well below the Environmental Protection Agency (EPA) guideline for industrial land use.

Residents of Eunice will be unable to hear construction activities during any phase of construction due to the relatively high level of traffic noise already in the area. During operation the nominal average sound levels increase primarily due to the potential passage of an additional train per day adjacent to Eunice. The L_{dn} at the proposed CISF during construction and operation are well below both the EPA guideline for residential properties and prevailing background levels.

Estimated L_{dn} values during construction and operation of the proposed CISF have been provided in New ER Tables 4.7-1, 4.7-2, and 4.7-3.

ER Section 4.7 has been updated to reflect this discussion.

The concrete batch plant has been eliminated from the proposed CISF as discussed in the ISP response to RAI PA-2, so it was not considered for the noise evaluation.

References:

1. Nelson Acoustics, "Noise Assessment for ISP CISF," Austin, TX, 2019.

2. Federal Highway Administration (FHWA)," FHWA Roadway Construction Noise Guide Users's Manual," FHWA-HEP-05-054, January 2006.

3. International Organization for Standardization (ISO), "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation," ISO 9613-2, December 1996.

Impact:

ER Sections 4.7 and 9.0 have been revised, and Tables 4.7-1, 4.7-2, and 4.7-3 and Figures 4.7 1 and 4.7 2 have been added as described in the response.

4.7 NOISE IMPACTS

Sources of noise during facility construction and operation would be related to traffic entering and leaving the facility and to construction equipment. Ambient background noise sources in the area include vehicular traffic along New Mexico Highway 234, the concrete quarry to the north of the site, the landfill to the south of the site, the waste facility to the south of the site, train traffic along the tracks located on the south border of the site, low flying aircraft traffic from Eunice Airport, birds, cattle, and wind gusts.

4.7.1 Predicted Noise Levels

The EPA's recommended Day-Night Average Sound Level (LDN) for industrial sites, as well as "Farm Land and General Unpopulated Land" is 70 dBA (EPA, 1973). *ISP performed an acoustical analysis of the background sound levels in July of 2019 in areas surrounding the proposed CISF (Nelson Acoustics, 2019). This formed the basis for determining estimates of noise levels that would be generated during construction and operation of the proposed CISF. Estimates were performed for nine Noise-Sensitive Areas (NSA) around the proposed CISF and the city of Eunice, NM. Figures 4.7-1 and 4.7-2 provide the locations for each of the NSAs.*

Noise levels during construction and operations were estimated based on noise levels from construction equipment and additional noise sources related to mechanical equipment associated with the Security and Administration Building and the Cask Handling Building. In addition, noise from vehicle backup alarms were added (Nelson Acoustics, 2019).

A-weighted Sound Power Level and temporal Usage Factors for construction vehicles were obtained from the Federal Highway Administration's Roadway Construction Noise Guide User's Manual (FHWA, 2005). Typical construction octave band spectral shapes and Sound Power Levels for other equipment were obtained from various resources as stated in the report (Nelson Acoustics, 2019). Noise emission levels from the Waste Control Specialists locomotive were extracted from direct measurements performed during the site visit. Factors for geometric divergence and excess attenuation due to air and ground absorption were computed in accordance with ISO 9613-2 (ISO, 1996), then applied to yield Sound Pressure Level estimates. No "credit" was taken for intervening terrain or material stockpiles that could further reduce offsite levels since occasional weather conditions can cause these barriers to be bypassed.

All Indicated Changes are in response to RAI NOI-2

During construction, increased sound levels may be noticeable from directly neighboring facilities (URENCO, Sundance Services, and Permian Basin Materials), especially during Phase 1 construction. During operation of the facility, the nominal average sound levels increase primarily due to the potential of the passage of an additional train per day. The sound level, L_{dn} for construction and operation is well below the EPA guideline for industrial land use.

Residents of Eunice will be unable to hear construction activities during any phase of construction due to the relatively high level of traffic noise already in the area. During operation the nominal average sound levels increase primarily due to the potential passage of an additional train per day adjacent to Eunice. The L_{dn} at the proposed CISF during construction and operation are well below both the EPA guideline for residential properties and prevailing background levels.

Estimated L_{dn} values during construction and operation at the proposed CISF are provided in Tables 4.7-1, 4.7-2, and 4.7-3.

Table 4.7-1: Estimated Noise Impact at NSAs during Phase 1 Construction

NSA	Type	Approximate Distance and Direction Relative to the CISF	Estimated Ambient L_{dn} (dBA)	Estimated CISF Phase1 Construction L_{dn} (dBA)	Estimated Total L_{dn} During Construction (dBA)	EPA Recommended L_{dn} (dBA)	Potential Noise Increase (dBA)
1	Boundary	6100 ft. SW	47.9	43.2	49.1	70	1.3
2	Boundary	3900 ft. W	42.6	48.4	49.4	70	6.8
3	Boundary	4000 ft. WNW	41.6	48.6	49.4	70	7.8
4	CISF	SW Corner	39.1	69.9	69.9	---	30.8
5	WCS LSA Pad	NE Corner	39.8	60.0	60.1	---	20.3
6	Residential	3.9 mi. WSW	64.5	30.2	64.5	55	0.0
7	Residential	4.1 mi. WSW	58.9	29.6	58.9	55	0.0
8	Residential	5.3 mi. WSW	47.0	27.1	47.0	55	0.0
9	Residential	4.9 mi. WSW	55.5	27.9	55.5	55	0.0

All Indicated Changes are in response to RAI NOI-2

Table 4.7-2: Estimated Noise Impact at NSAs during Phase 2-8 Construction

NSA	Type	Approximate Distance and Direction Relative to the CISF	Estimated Ambient L_{dn} (dBA)	Estimated CISF Phase 2-8 Construction L_{dn} (dBA)	Estimated Sound L_{dn} During Operation (dBA)	Estimated Total L_{dn} During Construction (dBA)	EPA Recommended L_{dn} (dBA)	Potential Noise Increase (dBA)
1	Boundary	6100 ft. SW	47.9	37.7	41.4	49.1	70	1.2
2	Boundary	3900 ft. W	42.6	43.0	39.9	46.8	70	4.2
3	Boundary	4000 ft. WNW	41.6	43.7	39.1	46.6	70	5.0
4	CISF	SW Corner	39.1	57.8	58.4	61.2	---	22.1
5	WCS LSA Pad	NE Corner	39.8	52.2	55.1	57.0	---	17.2
6	Residential	3.9 mi. WSW	64.5	25.0	33.3	64.5	55	0.0
7	Residential	4.1 mi. WSW	58.9	24.3	28.8	58.9	55	0.0
8	Residential	5.3 mi. WSW	47.0	21.8	34.5	47.2	55	0.3
9	Residential	4.9 mi. WSW	55.5	22.6	33.2	55.5	55	0.0

Table 4.7-3: Estimated Noise Impact at NSAs during CISF Operation

NSA	Type	Approximate Distance and Direction Relative to the CISF	Estimated Ambient L_{dn} (dBA)	Estimated CISF Operation L_{dn} (dBA)	Estimated Total L_{dn} CISF + Ambient (dBA)	EPA Recommended L_{dn} (dBA)	Potential Noise Increase (dBA)
1	Boundary	6100 ft. SW	47.9	41.4	48.7	70	0.9
2	Boundary	3900 ft. W	42.6	39.9	44.5	70	1.9
3	Boundary	4000 ft. WNW	41.6	39.1	43.5	70	1.9
4	CISF	SW Corner	39.1	58.4	58.5	---	19.4
5	WCS LSA Pad	NE Corner	39.8	55.1	55.3	---	15.5
6	Residential	3.9 mi. WSW	64.5	33.3	64.5	55	0.0
7	Residential	4.1 mi. WSW	58.9	28.8	58.9	55	0.0
8	Residential	5.3 mi. WSW	47.0	34.5	47.2	55	0.2
9	Residential	4.9 mi. WSW	55.5	33.2	55.5	55	0.0

All Indicated Changes are in response to RAI NOI-2

FIGURE 4.7-1

NSA Locations Near the WCS CISF and Eunice, NM

All Indicated Changes are in response to RAI NOI-2

FIGURE 4.7-2

NSA Locations Near the WCS CISF

All Indicated Changes are in response to RAI NOI-2

EPA. (1993). (Environmental Protection Agency). External Exposure to Radionuclides in Air, Water, and Soil. Federal Guidance Report 12, EPA-402-R-93-081.

EPA. (1974). Environmental Protection Agency. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. EPA/ONAC 550/9-74-004.

EPA. (2016). U.S. Environmental Protection Agency. Retrieved from Air Emission Sources: http://www3.epa.gov/air/emissions/where.htm

EPRI. (2009). (Electric Power Research Institute). Cost Estimate for an Away-From-Reactor Generic Interim Storage Facility (GISF) for Spent Nuclear Fuel. Report No. 1018722. Electric Power Research Institute: Palo Alto, CA.

Federal Register. (2006, February 28). Notice of Issuance of Materials License Snm-2513 for the Private Fuel Storage Facility. Federal Register Volume 71, Number 39. Published on February 28, 2006.

FHWA. (2005). (Federal Highway Administration). FHWA Roadway Construction Noise Guide User's Manual. FHWA-HEP-05-054. January 2005.

Freidman, J. P. (2006). Nuclear Waste Disposal: A Taxing Real Estate Issue. Real Estate Issues. Published in Summer 2006, pages 5-13.

Galley, J. (1958). Oil and Geology in the Permian Basin of Texas and New Mexico,. Habitat of Oil:. American Association of Petroleum Geologists, p. 395-446.

GAO. (2012). (U.S. Government Accountability Office). Spent Nuclear Fuel: Accumulating Quantities at Commercial Reactors, Present Storage, and Other Challenges. Report GAO-12-797. United States Government Accountability Office: Washington, D.C.

GAO. (2014). (U.S. Government Accountability Office). Spent Nuclear Fuel Management: Outreach Needed to Help Gain Public Acceptance for Federal Activities that Address Liability. Report GAO-15-141. United States Government Accountability Office: Washington, D.C.

Grazulis, T. (1993). Significant Tornadoes, 1680-1991. Environmental Films. Published in July 1993.

Greene, J. (2016). Prime Examples of Wasteful Spending. The National Law Journal. January 18, 2016.

Gustavson, T. (1980). Faulting and Salt Dissolution,. Geology and Geohydrology of the Palo Duro Basin, Texas Panhandle, A Report on the Progress of Nuclear Waste

All Indicated Changes are in response to RAI NOI-2

Institute, N. E. (2015). Retrieved from Policy Brief: Nuclear Energy Industry Supports a Sustainable, Integrated Used Nuclear Fuel Management : http://www.nei.org/Prints?printpath=/Master-Document-Folder/Backgrounders/Policy-Briefs/Nuclear-Energy-Industry-Supports-a-Sustainable,-In&classname=custom.document&pNm=PolicyBriefs

Jablon, S., Hrubec, Z., & and Boice Jr, J. (1991). Cancer in Populations Living Near Nuclear Facilities: A Survey of Mortality Nationwide and Incidence in Two States. JAMA. 265(11):1403-1408.

RAI EMM-1

Interim Storage Partners (ISP 2019). WCS Consolidated Interim Storage Facility System Safety Analysis Report, NRC Docket No. 72-1050, Revision 3.

RAI NOI-2

ISO. (1996). (International Organization for Standardization). Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation. December 1996.

Jablon, S., Hrubec, Z., Boice Jr, J., & and Stone, B. (1990). Cancer in Populations Living Near Nuclear Facilities. Public Health Service, U.S. Department of Health and Human Services. Bethesda, Maryland: NIH Publication 90-874.

Jackson, T. O. (2001). The Effect of Previous Environmental Contamination on Industrial Real Estate Prices. The Appraisal Journal, 200-210.

Jones, I. (2001). Cenozoic Pecos Alluvium Aquifer. Aquifers of West Texas. Texas WatDevelopment Board Report 356, ed. R.E. Mace, W.F. Mullican III, and E.S. Angle, p. 120-134.

Joyce, E. (2015). Solar Project Planned at Former California Nuclear Power Plant Site. Capital Public Radio. September 10, 2015.

Kirk, J. S. (2015, August 27). Teleconference with Judge Skeet Jones on Loving County, Texas Site.

Learn, S. (2011). Transfer spent fuel at Trojan closed nuclear plant to interim site, commission says. The Oregonian. Published on August 01, 2011.

Lehman, T. (1994b). Save the Dockum Group!: West Texas Geological Society. Bulletin 34(4), p. 5-10.

Lehman, T. (1994a). The Saga of the Dockum Group and the Case of the Texas/New Mexico Boundary Fault: New Mexico Bureau of Mines and Mineral Resources. Bulletin 150, p. 37-51.

Libow, G. (2001). Land Sale for Power Plant Stalled. Tribune Digital – The Courant. October 12, 2001.

RAI NOI-3

Provide information on peak noise to workers during construction and operation of the proposed CISF. This information should include:

- Estimated peak noise levels that workers would be exposed to.
- Comparison of estimated peak noise levels to workers with Occupational Safety and Health Administration (OSHA) regulatory limits.
- Mitigation measures that would be implemented to reduce noise levels to workers.

The ER should assess the environmental impacts of noise to workers during construction and operation of the proposed CISF. Specifically, estimates of peak noise levels that workers will experience during construction and operation of the proposed CISF are needed to support the NRC staff's evaluation of noise impacts to onsite receptors.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI NOI-3:

The acoustical analysis performed for ISP in July of 2019 [1] estimated the maximum noise levels to workers that would occur during construction and operation of the proposed CISF. Personnel noise exposure is a function of the shift average sound pressure level $L_{A,EQ}$, identical to time-weighted average (TWA) as defined by the Occupational Safety and Health Administration (OSHA) for continuous noise sources, and slightly less for the sources contemplated in the report. OSHA regulations per 29 CFR 1910.95 Table G-16 require that personnel do not receive an unprotected noise dose in excess of 90.0 dBA for an 8-hour shift and 88.4 dBA for a 10-hour shift.

Some of the estimated A-weighted (adjusted sound levels to express relative loudness of sounds in air as perceived by the human ear) work area sound levels exceed 90 dBA in large part because of backup alarms. Generic backup alarms are typically 115 dBA at 4 feet, which is usually considerable more than necessary to assure awareness of moving vehicles.

Estimated shift-average construction levels are high especially in the work areas for the buildings due to the amount of equipment active in a relatively small area. Levels are lower on the more extended areas (General Earthwork, Protected Area, Storage Pad Construction). Levels are dependent on the assumed source sound power levels and utilization percentages.

New ER Tables 4.7-4, 4.7-5, and 4.7-6 provide estimated TWA and Shift-Maximum (L_{pA}) sound levels for construction and operation of the proposed CISF.

Based on the estimated noise levels, hearing protection is recommended for most of these activities (TWA>80 dBA). Noise reduction ratings (NRRs) of hearing protectors should be capable of reducing at-the-ear exposure to 85.0 dBA (8-hour, Operation) and 83.2 dBA (10-hour, Construction). For maximum sound levels (L_{pA}) there is not an explicit OSHA limitation. The maximum sound levels occur on rare occasions when everything at a facility/operation occurs at the exact same time. The TWA are based on the fact that noise producing activities are starting and stopping for the given utilization and the maximum sound levels are included in the TWA.

ER Section 4.7 has been updated to reflect this discussion.

References:

1. Nelson Acoustics, "Noise Assessment for ISP CISF," Austin, TX, 2019.

Impact:

ER Section 4.7 has been revised and ER Tables 4.7-4, 4.7-5, and 4.7-6 have been added as described in the response.

The acoustic analysis report performed for ISP also estimated the maximum noise levels to workers that would occur during construction and operation of the proposed CISF. Personnel noise exposure is a function of the shift average sound pressure level $L_{A,EQ}$, identical to Time Weighted Average (TWA) as defined by the Occupational Safety and Health Administration (OSHA) for continuous noise sources, and slightly less for the sources contemplated in the report. OSHA regulations per 29 CFR 1910.95 require that personnel not receive an unprotected noise dose in excess of 100% in any given shift. This corresponds to 90.0 dBA for an 8 hour shift and 88.4 dBA for a 10 hour shift.

Estimated shift-average construction levels are high especially in the work areas for the buildings due to the amount of equipment active in a relatively small area. Levels are lower on the more extended areas (General Earthwork, Protected Area, Storage Pad Construction). Levels are dependent on the assumed source sound power levels and utilization percentages.

Tables 4.7-4, 4.7-5, and 4.7-6 provide estimated Shift-Average (TWA) and Shift-Maximum (L_{pA}) sound levels for construction and operation of the proposed CISF.

Based on the estimated noise levels, hearing protection is recommended for most of these activities (TWA>80 dBA). Noise reduction ratings (NRRs) of hearing protectors should be capable of reducing at-the-ear exposure to 85.0 dBA (8-hour, Operation) and 83.2 dBA (10-hour, Construction). For maximum sound levels (L_{pA}) there is not an explicit OSHA limitation. The maximum sound levels occur on rare occasions when everything at a facility/operation occurs at the exact same time. The TWA are based on the fact that noise producing activities are starting and stopping for the given utilization and the maximum sound levels are included in the TWA.

All Indicated Changes are in response to RAI NOI-3

Table 4.7-4 Estimated Baseline Noise Exposure during Phase 1 Construction

Activity	TWA (dBA)	Max L_{pA} (dBA)
General Earthwork	83	89
Cask Handling Building	92	99
Security/Admin Building	94	100
Storage Pad	88	96
Protected Area	83	89

Table 4.7-5 Estimated Baseline Noise Exposure during CISF Operation

Activity	TWA (dBA)	Max L_{pA} (dBA)
Storage Module Construction	92	103
Cask Transport	89	97

Table 4.7-6 Estimated Baseline Noise Exposure during Phase 2-8 Construction Including Operation

Location	TWA (dBA)	Max L_{pA} (dBA)
Storage Pad	87	97
Protected Area	78	89

CULTURAL AND HISTORIC RESOURCES (CHR)

RAI CHR-1

Clarify whether additional historic and cultural resources identification work, surveys, and Federal, State, or Tribal agency coordination will be needed prior to construction and operation of the proposed CISF because of construction activities potentially extending into New Mexico. If so, provide a description of the identification work, surveys, and agency coordination that would need to be completed and an anticipated schedule.

In response to its review of ISP's archeological survey of the proposed CISF site, the New Mexico State Historic Preservation Officer (NM SHPO) stated, "The SHPO concurs that no additional cultural resources identification efforts are needed for this undertaking with the condition that all new ground-disturbing and construction activities are confined to Texas. If, however, any construction related ground disturbances such as staging areas, equipment or materials storage yards, or access roads are needed in New Mexico, then a cultural resource survey will be required to identify and evaluate historic properties in the area of potential effects." (see ER Appendix A, Attachment 3-3). Figures in the ER and SAR show that the railroad side track to be built as part of the proposed CISF would extend into New Mexico (e.g., ER Figures 3.3-1, 3.6-1, 4.5-1, 4.12-1, and 6.1-1 and SAR Figures 1-1, 1-2, and 2-1). Therefore, the route of the railroad side track would result in new ground-disturbing and construction activities in New Mexico. Specifically, the requested information is needed to support the NRC staff's evaluation of applicable agency coordination and consultation requirements and complete the NRC staff's description of the affected environment and assessment of environmental impacts on cultural and historic resources in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (d), which require that the ER include a description of the affected environment and a description of the status of compliance with applicable environmental quality standards and requirements, including limitations and requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.

Response to RAI CHR-1:

As of June 2019, ISP no longer plans to include project elements located in New Mexico; the project will be entirely confined to the state of Texas. See RAI Response PA-1 regarding removal of the New Mexico rail side track from the project and updates to the ER.

Impact:

No Changes as a result of this RAI.

RAI CHR-2

Provide a copy (electronic or website link) of the draft report or final report, if prepared, for the archeological survey conducted in May 2015 to inventory and evaluate archeological resources within the footprint of the proposed CISF.

ER Section 3.8.2 states that, "In May 2015, a pedestrian archeological survey was completed in order to inventory and evaluate archeological resources on private land within the footprint of the proposed spent nuclear fuel CISF at the existing Waste Control Specialists waste disposal facility in western Andrews County, Texas." Information in ER Appendix A and D, indicates that the draft report for this survey entitled, "Intensive Archeological Survey of the Proposed Waste Control Specialists Spent Nuclear Fuel Consolidated Interim Storage Facility, Andrews County, Texas," was submitted for review to the Texas Historical Commission (THC) on July 2, 2015. The requested information is needed to support the NRC staff's description of the affected environment and assessment of environmental impacts on cultural and historic resources in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(b) and (b)(1), which requires that the ER include a description of the affected environment and a discussion of the impacts of the proposed action.

Response to RAI CHR-2:

The archeological survey completed in 2015 for the WCS CISF titled Intensive Archeology Survey of the Proposed WCS CISF in Andrews County, TX has been added to the ER as Attachment 3-4. In addition, Section 3.8.2 has been updated to point to Attachment 3-4 for the report.

A previous cultural resource survey was completed in 1994 for the neighboring Waste Control Specialists Facility. The 1994 survey and 1994 and 2004 "No Effect" confirmation letters from the Texas Historical Commission have been incorporated into the ER as Attachment 3-5. In addition, Section 3.8.3 has been updated to point to Attachment 3-5 for the report.

The 2015 survey defined the Area for Potential Effect (APE) as a footprint of 216 acres, which covers the entire Protected Area (PA), where a majority of ground disturbance activities are expected. The 2015 APE covers 44% of the Owner Controlled Area (OCA), where limited ground disturbance beyond the footprint is planned.

Impact:

ER Sections 3.8.2 and 3.8.3 and Attachments 3-4 and 3-5 have been revised as described in the response.

(RTHL), properties or districts listed on the National Register of Historic Places (NRHP), State Antiquities Landmarks (SALs), cemeteries, or other cultural resources that may have been previously recorded. No such resources were identified within the APE for direct effects. The nearest previously identified resource is the OSHM for Andrews County, located approximately 27 km (17 mi) southeast of the project area.

According to a search of the New Mexico Cultural Resources Information System (NMCRIS), there are no previously-identified non-archeological historic resources located within the APE for direct or indirect impacts. The closest historic resource in New Mexico is "HCPI 37299" (building at 703 Ruth Circle, Eunice, Lea County), located approximately 7.2 km (4.5 mi) from the CISF.

3.8.2 Historical and Cultural Resource Analysis

In May 2015, a pedestrian archeological survey was completed in order to inventory and evaluate any archeological resources on private land within the footprint of the proposed spent nuclear fuel the CISF at the existing Waste Control Specialists waste disposal facility in western Andrews County, Texas *(Attachment 3-4)*. Because the project includes a host agreement with Andrews County, a political subdivision of the State of Texas, the project is considered subject to the Antiquities Code of Texas. The project would also be subject to Section 106 of the NHPA, as amended, due to oversight and licensing by the NRC.

Chris Dayton, PhD in Archeology and a Registered Professional Archeologist and Steven Schooler, MA in Anthropology/Archeology of CMEC carried out the survey on behalf of the County and Waste Control Specialists under Texas Antiquities Permit 7277.

3.8.3 Previous Investigations and Previously Identified Archeological Resources

Neighboring facility Waste Control Specialists completed a "Cultural Resource Survey of A Proposed Waste Facility Andrews County, Texas" in 1994. The 1994 survey and associated letters from the Texas Historical Commission are located in Attachment 3-5.

A data search of the Texas Archeological Sites Atlas maintained by the THC and the Texas Archeological Research Laboratory (TARL) was conducted in order to identify any previously recorded cemeteries, historical markers, NRHP properties or districts, SALs, archeological sites, and previous surveys in the archeological APE, which consisted of the footprint of the proposed

ATTACHMENT 3-4

INTENSIVE ARCHEOLOGICAL SURVEY OF THE PROPOSED WASTE CONTROL SPECIALISTS SPENT NUCLEAR FUEL CONSOLIDATED INTERIM STORAGE FACILITY, ANDREWS COUNTY, TEXAS

Proprietary Information in Attachment 3-4 (22 pages)
Withheld Pursuant to 10 CFR 2.390.

Attachment 3-4 added in response to RAI CHR-2

ATTACHMENT 3-5

CULTURAL RESOURCE SURVEY OF A PROPOSED WASTE FACILITY, ANDREWS COUNTY, TX (1994) AND TEXAS HISTORIC COMMISSION "NO EFFECT" CONFIRMATION LETTERS (1994 AND 2004)

ATTACHMENT 2: JUNE 2004 TEXAS HISTORIC PRESERVATION "NO EFFECT" CONFIRMATION LETTER

URS

June 15, 2004

Mr. Mark Denton
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711

Re: Waste Control Specialists- No Effect Confirmation

Dear Mr. Denton:

As a follow up to our recent telephone conversation on June 10, 2004, this letter is being submitted to receive an updated stamp of the "No Effect" determination for the Waste Control Specialists (WCS) site located in Andrews County. Enclosed is a copy of the cover letter stamped by Dr. James Bruseth in 1994 for the WCS site. WCS is planning to expand operations located within the same area (approximately 1300 acres) included in the original evaluation of the site and is not proposing any activities that would be located outside the area previously considered.

If you have any questions or require any additional information, please contact me at 801-904-4019. Thank you for your assistance.

Sincerely,

Jeff Linn
URS Corporation

PROPERTIES AFFECTED
PROJECT MAY PROCEED
for Director, Texas Historical Commission
6-25-04

URS Corporation
756 East Winchester Street, Suite 400
Salt Lake City, Utah 84107
Tel: 801.904.4000
Fax: 801.904.4100
www.urscorp.com

ATTACHMENT 3: AUGUST 1994 TEXAS HISTORIC PRESERVATION "NO EFFECT" CONFIRMATION LETTER

ENVIRONMENTAL

RECEIVED
AUG 14 1994
TEXAS HISTORICAL COMMISSION

August 12, 1994 Hand Delivered

Mr. James E. Bruseth, Ph.D.
Deputy State Historic Preservation Officer
TEXAS HISTORICAL COMMISSION
P.O. Box 12276
Austin, Texas 78711

Attn.: Timothy K. Perttula, Ph.D.

Re: Waste Control Specialists
TNRCC Permit No. 50358

Dear Mr. Bruseth:

Enclosed is one copy of the report prepared by Galvan Eling Associates, Inc. entitled "Cultural Resource Survey of A Proposed Waste Facility Andrews County, Texas". This report provides the results of the cultural resource survey as requested by your letter of 18 July 1994 and as agreed during our meeting of 26 July 1994. The report concludes that the study area offered few enticements to prehistoric people or early settlers and that no evidence of their use of this tract was found and no cultural resources stand as an impediment to construction of this waste facility.

We look forward to your timely approval of the report. If you have any questions or need additional information in the intervening time, please call me at (512) 327-5775.

Sincerely,

Allen Messenger, P.E.

enclosure

NO EFFECT
On National Register-eligible or listed properties or State Archeological Landmarks
PROJECT MAY PROCEED
BY
James E. Bruseth, Ph.D., DSHPO
Date 8/12/94

cc: K. N. Bigham, WCS, Pasadena
Mike Woodward, Woodward & Stewart, Austin

1016 Mopac Circle, # 101 Austin, Texas 78746 (512) 327-5775 Fax 327-4570

ATTACHMENT 4: CULTURAL RESOURCE SURVEY OF A PROPOSED WASTE FACILITY, ANDREWS COUNTY, TX

Cultural Resource Survey of A Proposed Waste Facility Andrews County, Texas

Submitted to:
AM Environmental, Inc.
Austin, Texas

Galván Eling Associates, Inc.
3200 Breeze Terrace
Austin, Texas 78722

August, 1994

Abstract

On August 4, 1994, Galván Eling Associates, Inc. assessed the cultural resource potential of a 150-acre tract in Andrews County, Texas for AM Environmental, Inc. of Austin. The absence of prehistoric or significant historic occupation or exploitation of this tract can be attributed to the lack of essential resources. Cultural resources do not stand as an impediment to construction of a waste facility on this property.

Table of Contents

List of Figures

Introduction

At the request of AM Environmental Inc., Galván Eling Associates, Inc. conducted a cultural resources assessment of a 150-acre waste control facility site in Andrews County, Texas (Figure 1). The survey area is on the Flying W Diamond Ranch, 30 miles northwest of Andrews, immediately east of the New Mexico-Texas state line and north of Texas Hwy 176. The field work was accomplished by Carole Medlar, Frank Garcia, and Kelly Scott on August 4, 1994.

Methods

The survey tract was inspected by pedestrian transects walked at intervals ranging from 10 to 30 meters, depending upon the local topography. Close interval transects paralleled the only ephemeral drainage on the survey tract and encircled as well as crosscut the five depressions, or buffalo wallows, that were considered to hold some, albeit minor, potential for prehistoric or early historic exploitation. Photographs were taken to document the general topography and vegetation.

Natural Environment

Application for a hazardous waste permit requires exhaustive and complete environmental analysis. The environmental information pertinent to the potential for archeological resources on the tract is detailed in volume 4 of AM Environmental, Inc.'s (1993) permit application and is only summarized here.

The survey area is in the southern portion of the North American Great Plains physiocgraphic zone on the southwestern edge of the Southern High Plains or Llano Estacado. The region is bounded by the Pecos River plain to the south and west, Mescalero Ridge to the northwest, Monument Draw (New Mexico) and Rattlesnake Ridge to the west, and the Llano Estacado to the north and east. The waste facility will be built in an area where the caliche sediments of the Tertiary Ogallala Formation lay unconformably on Triassic red bed clay of the Dockham Group (Bureau of

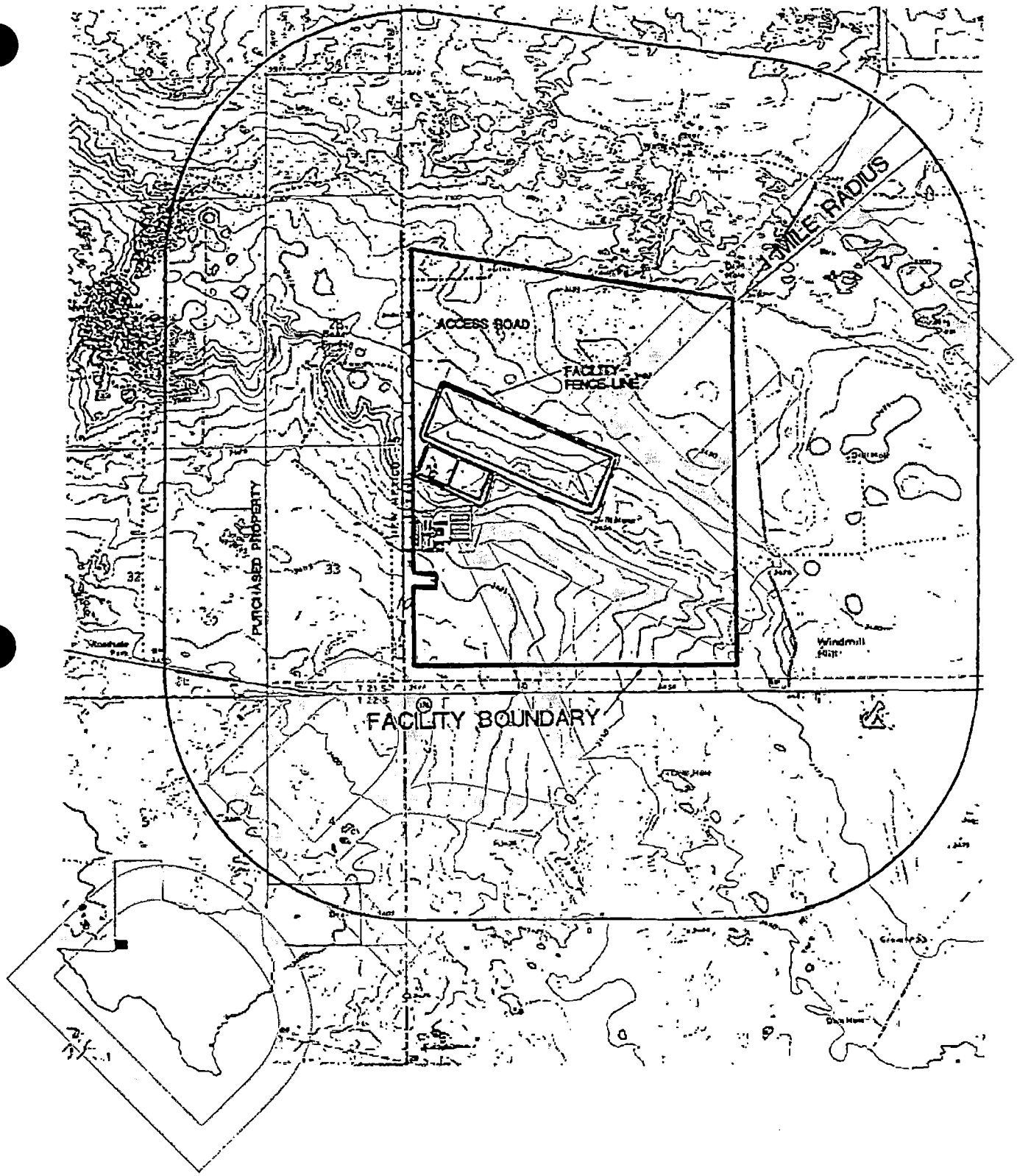


FIGURE 1. Map of study area.

Economic Geology 1976). In the survey tract, the windblown sands that caused Ferguson (1986) to call this area the "Seminole Sand Sheet" are a thin veneer overlying shallow brown silty sandy sediments broken by outcrops of the underlying caliche. Sand, gravel, and highly cemented caliche are quarried less than a mile west of the state line and the western boundary of the waste facility tract.

The nearest major drainage is Monument Draw, southwest of the study area in New Mexico (not to be confused with Texas' Monument Draw that flows east through northern Andrews County). Baker Spring, 650 meters west of the facility, was a seasonal seep emanating from an outcrop of the Ogallala Formation but flow ceased some 7 years ago. Water is sometimes found at the base of the Ogallala Formation in isolated gravel beds under slight depressions, locally called buffalo wallows. Thus, these topographic features influence human and animal exploitation of the arid plains.

The climate is temperate and arid, averaging 14.5 inches of annual precipitation. About 70% of the rain falls between May and October and the annual evaporation rate exceeds precipitation by 58 inches. The mean annual high temperature is 77.4 degrees F; the minimum is 49.4 degrees F. (Bomar 1983).

The plains were described as a sea of grass that supported huge herds of grazing animals, the mainstay of the native economies (Hughes 1989). Modern land use has been solely cattle pasture and the resident fauna are now coyotes, jack rabbits, field rodents, snakes and other reptiles, and a varied bird population. The vegetation of the study area is low grasses broken by scrub mesquite that grows more thickly in the five slight depressions that pock the generally level terrain (Figure 2a). Elevation ranges from 3,487 to 3,422 feet AMSL and the relief does not vary by more than 3 or 4 feet at maximum. Two "ridges" rise about 1 or 2 feet above the plain; the deepest of the depressions does not exceed 4 feet in depth (AM Environmental, Inc. 1993).

Prehistoric environmental changes in the region generally correlate with the Antevs (1955) model, and consist of a post-Pleistocene, cool and moist Anathermal (10,000-7500 B.P.), a warm and dry Altithermal (7500-4000 B.P.) and a moderate Medithermal (4000 B.P. to present). These periods correlate to documented heavy occupation of the Llano Estacado in the Paleoindian period, from 14,000 to 7000 B.P., a dearth of occupation between 7000-4000 B.P., the Early and Middle Archaic periods, and the resumption of aboriginal occupation around 4000 B.P., a presence which was sustained until Historic times (Hughes 1989).

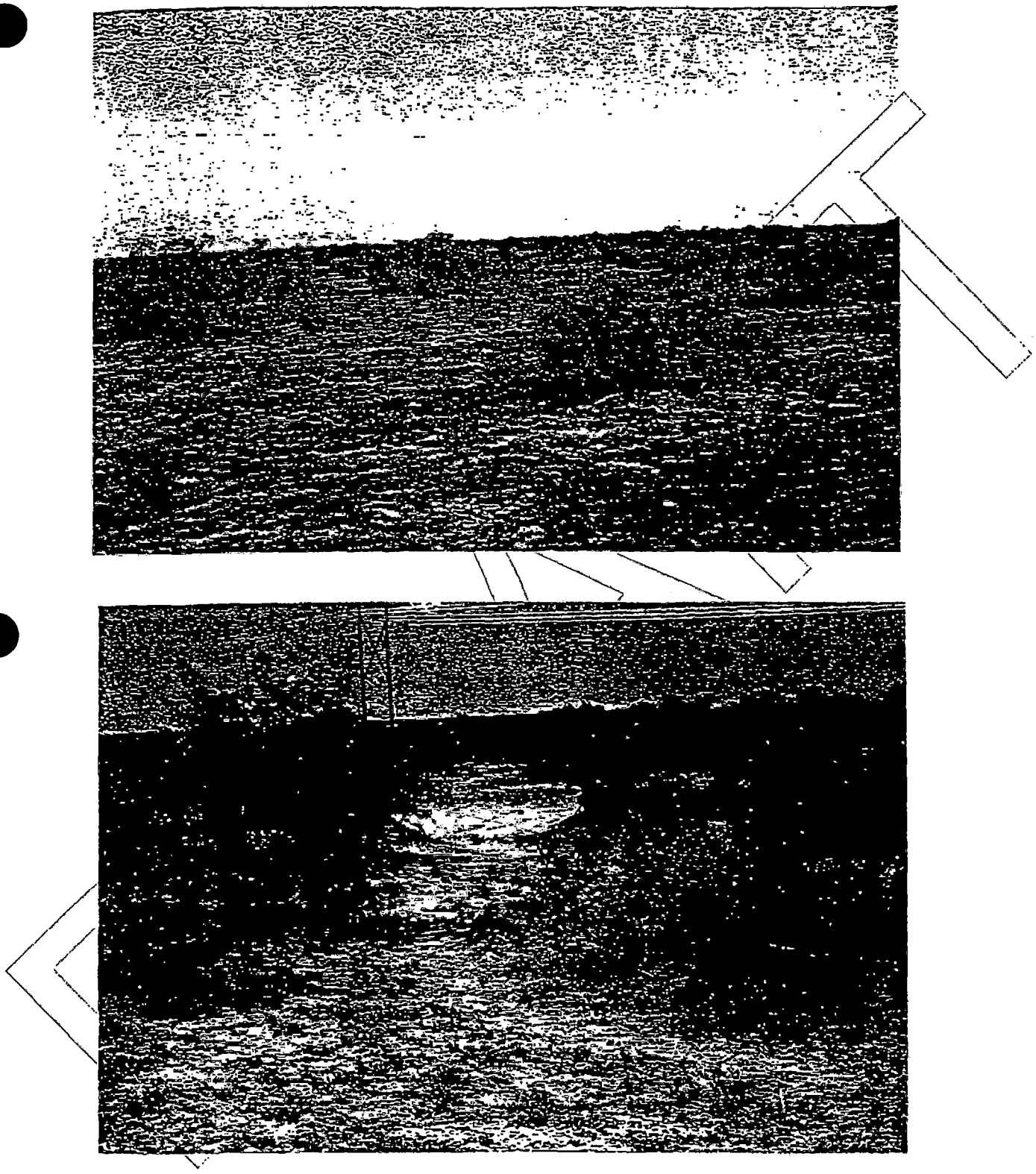


FIGURE 2. Environmental setting. a) topography and vegetation in the study area; b) slight depression in ephemeral drainway, trampled by cattle.

Cultural Background

Hughes (1989) summarized prehistoric cultural developments on the High Plains, including the South Plains or Llano Estacado. Ignoring variability introduced by ethnic diversity and the influences radiating from more complex nieghboring societies, the long span of prehistory was divided into Paleoindian, Archaic, and Neoindian stages, with the latter two further subdivided into Early and Late substages. The Historic period begins with Coronado's expedition in 1540 but the area remained largely under the control of Plains Indians until the mid-1870s. Andrews County, named for a Texas revolutionary, was formed from Bexar County in 1876 and organized in 1910 (Conner, et al. 1974). In 1890, only 24 people lived in the county. Oil was struck in 1929. The modern economy is dominated by cattle ranching and energy production, both evidenced on the Flying W Diamond Ranch.

The majority of the 52 recorded sites in Andrews County were recorded as part of the permitting process for oil and gas pipelines. Most are burned rock or burned caliche features or scatters with few other artifacts found in dune blowouts with no apparent nearby water source; a lesser number were on dunes or eroded uplands next to playas (see Kibler 1991 for a discussion of site distributions in this region). The dominant period of occupation, when determinable, was during the Late Archaic and Late Prehistoric periods. One site recorded by a local amateur archeologist, 41AD42, contained three Paleoindian points (Scottsbluff, Milnesand and Eden).

The only systematic archeological study in the county that exceeded the survey level of investigation was accomplished by Collins (1968) who documented the Andrews Lake site complex. Eight sites, ranging in age from Paleoindian to Historic, and featuring masonry foundations of several dwellings, clay and stone-lined hearths, burned rock hearths, numerous burials, caches and stone walls, were apparently supported by semi-permanent water in Andrews Lake, east of the current survey area.

Results of the Survey

Despite the special attention paid to the one subtle drainage feature and the slight depressions that had some limited potential for prehistoric exploitation, no cultural remains worthy of site designation were found by this survey. Six pieces of burned caliche, averaging less than 3.5 cm in maximum dimension, were noted on the northeast side of the drainway, next to a slight depression that had been heavily trampled by cattle (Figure 2b). Two clusters of three pieces, linearly distributed over an area about 1 meter long, were found 20 meters apart, separated by a barren stretch of hard packed shallow sediments littered with unburned lumps of caliche. The area was subjected to intensive scrutiny, including cutting a profile into one of the nearby remnant hummocks of soil, but no evidence bearing upon the age or origin of the burned caliche was produced. This drainway lacks both gathering and retentive capability and probably holds water for less than a day after a heavy rain.

Two of the five slight depressions in the study area are shown as playas on the USGS Eunice NE 7.5' quadrangle map but none of these "buffalo wallows" have much water retention capacity. According to the geologic reports, they lack the impermeable clay linings that inhibit rainfall absorption in true playas. No evidence of historic or prehistoric use of this features was found beyond the intensified grazing of cattle drawn to the grasses that grow in the bottoms of these depressions.

Comparative data were obtained by a visit to Baker Spring, shown on the USGS maps less than 400 meters west of the state line that is the western boundary of the study area. According to local informants, spring flow ceased about 7 years ago, a fact they attribute to blasting at the adjacent quarry. Historic debris, reportedly the remains of early ranch buildings, was abundant but prehistoric material consisted solely of less than 10 chert flakes and one thin end scraper. This site is in New Mexico and was not recorded but it serves as a standard for judging the low intensity of prehistoric use of the immediate area.

The study area offered few enticements to prehistoric people or early settlers. It is not surprising that no evidence of their use of this tract was found and no cultural resources stand as an impediment to construction of this waste facility.

References Cited

AM Environmental, Inc.
1993 RCRA Permit Application for a Hazardous Waste Storage, Treatment, and Disposal Facility, Volume 5. Waste Control Specialists, Inc., Pasadena.

Antevs, E.
1955 Geologic Climate Dating in the West. *American Antiquity* 20(4):317-335.

Bomar, G. W.
1983 *Texas Weather*. University of Texas Press, Austin.

Bureau of Economic Geology
1976 Hobbs Sheet, Geologic Atlas of Texas. The University of Texas at Austin.

Conner, N.R., H.W. Hyde and H.R. Stoner
1974 *Soil Survey of Andrews County*. United States Department of Agriculture, Soil Conservation Service.

Ferguson, K.
1986 *The Texas Landscape: The Geographic Provinces of Texas*. Texas Mosaics, Austin.

Collins, M.B.
1968 The Andrews Lake Locality: New Archeological Data from the Southern Llano Estacado, Texas. Master's thesis, Department of Anthropology, University of Texas, Austin.

1971 A Review of Llano Estacado Archeology and Ethnohistory. *Plains Anthropologist* 16:85-104.

Hughes, J. T.
1989 Prehistoric Cultural Developments on the Texas High Plains. *Bulletin of the Texas Archeological Society* 60: 1-55.

Kibler, K. W.
1991 Surface Distributions of Sites and Survey Strategies for Draws on the Southern Llano Estacado. Master's thesis, Department of Anthropology, University of Texas, Austin.

SOCIOECONOMICS (SOC)

RAI SOC-1

Provide tax revenue information on a county and state level over a 40-year period.

Appendix A of the ER provides estimated employee compensation and regional tax impacts of the proposed CISF between 2019 and 2028. The iMpact analysis for PLANning (IMPLAN) model was run for a period of 20 years; however, ISP is requesting a license for a term of 40 years. This additional information is needed to evaluate the potential socioeconomic impacts on the states and the counties within the region during the requested license period.

This information is needed in accordance with 10 CFR 51.45(b)(1), which requires that the ER include a description of the impacts of the proposed action.

Response to RAI SOC-1:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

PUBLIC AND OCCUPATIONAL HEALTH (POH)

RAI POH-1

Provide a map or figure showing monitoring locations for background radiation levels.

ER Section 3.11.1.1 (Background Radiation Levels at the CISF) provides monitoring results in Table 3.11-1, but should also include a figure showing the monitoring locations. Monitoring results should include information about the locations where the monitoring occurred. The requested information would allow the NRC staff to evaluate the applicability of measurements to the proposed CISF location.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI POH-1:

ER Section 3.11.1.1 and ER Table 3.11-1 have been updated to include a reference to ER Figures 4.12-7, 4.12-8, and 4.12-9.

Impact:

ER Section 3.11.1.1 and Table 3.11-1 have been revised as described in the response.

Table 3.11-1, Detected concentrations of background radionuclides in samples collected in the vicinity of Waste Control Specialists during 2010 and 2011.

Sample Location	Sample type	Radionuclide	Min	Max	Mean	SD	Units	# samples
Note 1	Air	Cs-137	2.45E-04	1.19E-03	4.94E-04	2.07E-04	pCi/m3	18
	Air	GROSSA	4.36E-04	7.80E-03	1.68E-03	9.37E-04	pCi/m3	583
	Air	GROSSB	4.81E-04	3.67E-02	7.95E-03	3.33E-03	pCi/m3	624
	Air	K-40	1.78E-03	6.92E-03	3.64E-03	1.07E-03	pCi/m3	80
	Air	Pb-210	7.42E-04	1.23E-01	6.80E-03	6.21E-03	pCi/m3	759
	Air	Ra-226	2.44E-05	3.42E-03	1.47E-04	1.82E-04	pCi/m3	415
	Air	Ra-228	6.03E-05	4.93E-03	2.63E-04	4.46E-04	pCi/m3	270
	Air	Th-228	1.40E-05	2.43E-04	6.95E-05	2.96E-05	pCi/m3	265
	Air	Th-230	6.01E-06	2.93E-04	7.02E-05	3.23E-05	pCi/m3	354
	Air	Th-232	9.39E-06	2.51E-04	5.61E-05	2.67E-05	pCi/m3	325
	Air	Th-234	7.50E-03	9.53E-03	8.76E-03	1.10E-03	pCi/m3	3
	Air	U-233/234	5.49E-05	1.41E-03	1.54E-04	9.10E-05	pCi/m3	604
	Air	U-235/236	3.71E-06	7.29E-05	1.63E-05	1.04E-05	pCi/m3	135
	Air	U-238	3.84E-05	9.53E-03	1.94E-04	6.15E-04	pCi/m3	604

All Indicated Changes are in response to RAI POH-1

Sample Location	Sample type	Radionuclide	Min	Max	Mean	SD	Units	# samples
Note 2	Ground Water	GROSSA	1.36E+00	6.16E+01	1.15E+01	8.03E+00	pCi/L	677
	Ground Water	GROSSB	1.75E+00	1.12E+02	1.17E+01	1.02E+01	pCi/L	617
	Ground Water	K-40	4.08E+01	1.39E+02	8.56E+01	2.91E+01	pCi/L	9
	Ground Water	Pb-210	1.79E+00	6.42E+02	2.24E+01	9.45E+01	pCi/L	58
	Ground Water	Ra-226	1.25E-01	7.71E+00	5.93E-01	5.26E-01	pCi/L	567
	Ground Water	Ra-228	4.01E-01	4.16E+00	1.29E+00	6.28E-01	pCi/L	544
	Ground Water	Th-228	2.75E-02	2.03E-01	8.17E-02	3.89E-02	pCi/L	103
	Ground Water	Th-230	1.76E-02	3.07E-01	7.46E-02	4.35E-02	pCi/L	174
	Ground Water	Th-232	1.74E-02	1.36E-01	4.15E-02	2.45E-02	pCi/L	20
	Ground Water	Th-234	1.82E+02	1.82E+02	1.82E+02	NULL	pCi/L	1
	Ground Water	U-233/234	7.43E-02	3.73E+01	8.91E+00	6.95E+00	pCi/L	689
	Ground Water	U-235/236	4.23E-02	1.79E+00	2.97E-01	2.49E-01	pCi/L	415
	Ground Water	U-238	7.84E-02	1.82E+02	2.86E+00	7.43E+00	pCi/L	685
Note 3	Soil	Cs-137	1.29E-02	7.55E-01	1.07E-01	9.68E-02	pCi/g	441
	Soil	GROSSA	2.78E+00	2.27E+01	7.76E+00	2.90E+00	pCi/g	462
	Soil	GROSSB	3.14E+00	4.60E+01	1.28E+01	5.35E+00	pCi/g	489
	Soil	K-40	1.68E+00	1.89E+01	8.88E+00	3.24E+00	pCi/g	529

All Indicated Changes are in response to RAI POH-1

Sample Location	Sample type	Radionuclide	Min	Max	Mean	SD	Units	# samples
Note 3	Soil	Pb-210	1.92E-01	5.56E+00	1.17E+00	7.13E-01	pCi/g	355
	Soil	Ra-226	1.21E-01	1.29E+00	5.54E-01	1.79E-01	pCi/g	580
	Soil	Ra-228	1.07E-01	3.11E+00	6.35E-01	3.08E-01	pCi/g	628
	Soil	Th-228	2.06E-01	2.04E+00	6.85E-01	2.65E-01	pCi/g	293
	Soil	Th-230	1.21E-01	3.01E+00	6.72E-01	2.67E-01	pCi/g	890
	Soil	Th-232	1.73E-01	2.52E+00	6.53E-01	2.80E-01	pCi/g	376
	Soil	Th-234	1.48E-01	2.50E+00	7.49E-01	3.17E-01	pCi/g	275
	Soil	U-233/234	5.52E-02	1.09E+00	4.35E-01	1.64E-01	pCi/g	472
	Soil	U-235/236	1.63E-02	1.00E-01	4.55E-02	1.71E-02	pCi/g	133
	Soil	U-238	7.85E-02	2.50E+00	5.59E-01	2.73E-01	pCi/g	750

NOTES:

3. *Air Sample Locations are shown on Figure 4.12-7*
4. *Ground Water Sample Location are shown on Figure 4.12-8*
5. *Soil Sample Locations are shown on Figure 4.12-9*

All Indicated Changes are in response to RAI POH-1

3.11.1.1 Background Levels of Radiation at the CISF

ISP joint venture member Waste Control Specialists conducted pre-operational monitoring of the environment in 2010 and 2011 to develop a data set that could be used to characterize baseline levels of radiation and radioactivity prior to any LLRW disposal site operations, which began in 2012 (WCS, 2011). Pre-operational data, along with all subsequently collected data, are available through the RACER application. Available data for samples collected in 2010 and 2011 were obtained from the RACER database and are summarized in Table 3.11-1 to provide an indication of baseline radiological conditions in the vicinity of the Waste Control Specialists disposal facility. *Sample locations are shown on Figures 4.12-7, 4.12-8, and 4.12-9.* Table 3.11-1 shows the range of detected concentrations (min and max), along with the mean and standard deviation, for the background radionuclides expected to contribute most to radiation exposure in the CISF area. The CISF area is characterized as having relatively lower radon concentrations, consistent with other areas of Texas and the southwest U.S. and the levels of uranium and radium in the soil shown in Table 3.11-1 (NCRP, 2009).

3.11.1.2 Current Radiation Sources and Exposure Levels at the CISF

Radiation sources at the CISF include the naturally occurring background radiation and the LLRW and uranium byproduct material waste that is received by the facility and prepared and stabilized for disposal. Natural background levels were discussed in the previous section. The CWF will accept only stabilized LLRW of Classes A, B, or C from commercial waste generators. Waste shipments are received in a variety of sealed containers such as 55-gallon drums, rectangular steel boxes, and shipping casks. Waste is stabilized before disposal in the facility using concrete containers and grout. The FWF also accepts Classes A, B, and C LLRW. The FWF allows for two different disposal methods, containerized waste and non-containerized waste in the In-Cell Non-Containerized Disposal Unit (IC NCDU). The containerized section of the FWF, similar to the CWF, grouts containerized waste in concrete canisters. The IC NCDU accepts federal Class A waste in larger volumes of bulk soil or soil-like debris, rubble, or a single uniform piece qualified for disposal under the facility's license. Waste packaging and stability requirements limit the amount of radionuclide particulates or gasses that may be suspended into the air during waste handling, including unloading of shipments, repackaging, and containerizing of waste for disposal. Thus, inhalation is not a large contributor to worker dose. Waste Control Specialists accepts remotely handled waste with exposure rates of up to

All Indicated Changes are in response to RAI POH-1

RAI POH-2

Provide a map or figure of monitoring locations for historical exposures to radioactive materials.

ER Section 3.11.1.3 (Historical Exposure to Radioactive Materials at WCS) provides a table of monitoring results but should also include a map figure showing the monitoring locations. Monitoring results should include information about the locations where the monitoring occurred. The requested information would allow the NRC staff to evaluate the applicability of measurements to the proposed CISF location.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI POH-2:

ER Section 3.11.1.3 and ER Table 3.11-3 have been updated to include a reference to ER Figure 4.12-10.

Impact:

ER Section 3.11.1.3 and Table 3.11-3 have been revised as described in the response.

3.11.1.3 Historical Exposure to Radioactive Materials at the CISF

Both occupational and public external exposures at and around the CISF for the past five years are summarized in this section. These exposures are based on quarterly readings obtained from the thermoluminescent dosimeters (TLDs) and optically stimulated luminescent dosimeters (OSLs) worn by ISP joint venture member Waste Control Specialists site personnel and placed at various locations in the environment around the CISF. Table 3.11-2 summarizes occupational exposures for the past five years. Personnel exposures increased after operations began in 2012 because radioactive waste shipments for disposal commenced.

Table 3.11-3 summarizes environmental TLD and OSL measurements and calculated doses to the public for the past five years. *The sample locations are shown in Figure 4.12-10.* Background corrected doses are also shown based on subtraction of the pre-operational background dose as assumed by ISP joint venture member Waste Control Specialists as part of its annual REMP reporting (10 mrem). Averages including zero values (i.e., nondetects or values <= 0 after background subtraction) and excluding zero values are both shown. Doses measured during the pre-operational period of 2010–2011 are consistent with those measured during 2012–2014, and there is no evidence of an increase in external radiation exposure to the public after operations began in 2012. External radiation is not expected to be a significant source of exposure to members of the public due to distance and shielding from the materials managed at the CISF.

All Indicated Changes are in response to RAI POH-2

Table 3.11-3, Summary of environmental exposures at Waste Control Specialists' existing facilities based on TLD and OSL measurements (mean mrem y^{-1})[c]

Sample Location	Type	Year	Before background subtraction						After background subtraction					
			Annual total		Public dose (bounding)		Public dose (site-specific)		Annual total		Public dose (bounding)		Public dose (site-specific)	
			a	b	a	b	a	b	a	b	a	b	a	b
See Figure 4.12-10	OSLD	2010	8.7	8.7	2.0	2.0	0.4	0.4	2.1	7.1	0.5	1.6	0.1	0.4
	OSLD	2011	7.7	8.7	1.8	2.0	0.4	0.4	1.9	8.1	0.4	1.9	0.1	0.4
	OSLD	2012	6.7	9.1	1.5	2.1	0.3	0.5	2.0	8.6	0.5	2.0	0.1	0.4
	OSLD	2013	8.1	8.1	1.8	1.8	0.4	0.4	1.0	4.3	0.2	1.0	0.1	0.2
	OSLD	2014	7.3	11.3	1.7	2.6	0.4	0.6	2.4	9.2	0.5	2.1	0.1	0.5
	TLD	2010	16.8	16.8	3.8	3.8	0.8	0.8	7.2	9.0	1.6	2.1	0.4	0.5
	TLD	2011	16.3	16.3	3.7	3.7	0.8	0.8	6.9	8.6	1.6	2.0	0.3	0.4
	TLD	2012	12.2	12.2	2.8	2.8	0.6	0.6	4.2	7.9	1.0	1.8	0.2	0.4
	TLD	2013	6.1	6.1	1.4	1.4	0.3	0.3	1.0	3.8	0.2	0.9	0.0	0.2
	TLD	2014	14.7	14.7	3.4	3.4	0.7	0.7	7.4	12.1	1.7	2.8	0.4	0.6

a = with zero values included b = without zero values included c = 1mrem = 0.01mSv

All Indicated Changes are in response to RAI POH-2

WASTE MANAGEMENT (WM)

RAI WM-1

Provide generated waste volume estimates by waste type and facility lifecycle phase.

ER Section 3.12 (Waste Management) describes the wastes expected to be generated by the proposed action, including liquid (nonradioactive wastewater; sanitary) and solid waste (low-level radioactive waste, nonhazardous solid waste, hazardous waste). These descriptions do not provide information by lifecycle stage (i.e., construction, operations, decommissioning) and the expected volume of each waste that would be generated is not quantified. Volume estimates should be provided for any solid wastes that could be generated in larger than negligible quantities, for example:

- *Annual and cumulative volumes of nonhazardous solid waste that would be generated from the fabrication of 3,200 storage systems over 20 years (ER Section 3.12.1.3)*
- *Annual and cumulative volume of nonhazardous solid waste that would be generated during decommissioning*

The requested information will allow the NRC staff to evaluate the magnitude of potential waste management impacts for each proposed facility lifecycle stage. This includes impacts of waste generation on available capacity and operational life of disposal facilities.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-1:

ER Section 3.12 has been updated to include waste volume estimates for construction, operations, and decommissioning lifecycle phases of the CISF, with the specific volume estimates provided in new ER Tables 3.12-2, 3.12-3, and 3.12-4, respectively. The tables provide annual and cumulative volumes of nonhazardous solid waste, low-level radioactive solid waste, hazardous solid waste, and sanitary waste water (non-hazardous and non-radioactive). Cumulative lifetime waste volume estimates are provided in new ER Table 3.12-5.

Impact:

ER Section 3.12 has been revised and Tables 3.12-2, 3.12-3, 3.12-4, and 3.12-5 have been added as described in the response.

Table 3.11-10, Incidence Rates of Cancer in Andrews County Region (HSR9) and Texas 2007–2011

Rate per 100,000			Rate per 100,000		
Males	Region	State	Females	Region	State
All sites	497.1	504.6	All sites	378.9	387.1
Prostate	112.9	126.9	Breast	104.8	113.6
Lung	79.7	75.6	Lung	49.5	47.4
Colorectal	51.2	49.7	Colorectal	36.2	34.6

3.12 WASTE MANAGEMENT

Waste management for the CISF is divided into gaseous and liquid effluent, as well as solid waste. Descriptions of the sources and effluent systems for each of these waste streams are discussed in this section. *Waste volumes for CISF construction, operations (annual), and decommissioning life-cycle phases are provided in Tables 3.12-2, 3.12-3, and 3.12-4, respectively; lifetime cumulative waste volumes are provided in Table 3.12-5.* Disposal plans, waste minimization practices, and related environmental impacts are discussed in Section 4.13 of this report and Chapter 6 of the SAR.

3.12.1 Effluent Systems

Effluent systems are used to manage gaseous and liquid effluents to ensure that potential radiation doses to workers are compliant with the discharge limits specified in 10 CFR Part 20, maintain ALARA, and consistent with the philosophy of waste minimization, the term "waste" as used in this section refers to waste generated during operations at the CISF, and does not include SNF waste materials handled at the CISF.

These systems are described in more detail in Chapters 4 and 6 of the SAR.

3.12.1.1 Gaseous Effluents

Non-radiological air emissions would be generated primarily from diesel generators and engines used to provide electrical power and move equipment, including SNF, at the CISF. Non-

Table 3.12-2, Estimated Initial Construction Waste Volume

Initial Construction Activity	Non-Hazardous Solid Waste (tons)	Solid Low-Level Radioactive Waste (tons)	Hazardous Solid Waste (tons)	Sanitary Waste Water (gallons)
Storage Pad Construction	560	0	0.25	
Storage Module Construction	0	0	0	
Building Construction	47	0	0.33	
Site Preparation, Fence, Admin, Finish Work, Rail Construction	106	0	0.75	
TOTAL	**713**	**0**	**1.33**	**450,000**

Table 3.12-3, Estimated Annual Operational Waste Volume

Annual Operations Activity	Non-Hazardous Solid Waste (tons)	Solid Low-Level Radioactive Waste (tons)	Hazardous Solid Waste (tons)	Sanitary Waste Water (gallons)
Standard Operations and Admin	53	1.33	1.33	
Storage Module Construction (160 per year average)	2,336	0	0	
Expansion (Storage Pads, Fence line, etc.) [1]	232	0	0	
TOTAL	**2,621**	**1.33**	**1.33**	**185,000**

Note:

1. Averaged out per year

Table 3.12-4, Estimated Decommissioning Waste Volume

Decommissioning Activity	Non-Hazardous Solid Waste (tons)	Solid Low-Level Radioactive Waste (tons)	Hazardous Solid Waste (tons)	Sanitary Waste Water (gallons)
Survey, Decontamination, and Admin	33	98.34[1]	1.0	
Building Cleanout	47	0	0.33	
TOTAL	**80**	**98.34**	**1.33**	**190,000**

Note:

1. Based on the Decommissioning Plan estimate of 60.7 cubic yards and an assumed density of 120 pounds per cubic foot.

Table 3.12-5, Estimated Cumulative Waste Volume

CISF Facility Phase	Non-Hazardous Solid Waste (tons)	Solid Low-Level Radioactive Waste (tons)	Hazardous Solid Waste (tons)	Sanitary Waste Water (gallons)
Initial Construction	713	0	1.33	450,000
Operation (20 years)	52,420	26.6	26.6	3,700,000
Decommissioning	80	98.34	1.33	190,000
TOTAL	**53,213**	**124.94**	**29.26**	**4,340,000**

RAI WM-2

Provide additional information about the local municipal landfill and the WCS LLRW disposal facility, including the available capacity, annual disposed volume of waste, and currently projected operational life of these facilities.

ER Sections 3.12.1.3 (Solid Wastes) and 3.12.1.3.1 (Solid Low-Level Radioactive Waste) describe that nonhazardous solid waste and Low-Level Radioactive Waste (LLRW) would be disposed at a municipal landfill and the adjacent WCS LLRW facility, respectively, but provides no description of characteristics of these facilities. The characteristics of affected disposal facilities such as available capacity, annual disposed volume, and operational life will allow the NRC staff to evaluate the impacts of proposed waste generation on these facilities.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-2:

Low-level radioactive waste (LLRW) generated by the CISF would be sent to the Compact Waste Facility (CWF) within the Waste Control Specialists LLRW facility. The CWF is licensed to dispose of 9,000,000 cubic feet of waste over its lifetime. The facility, which opened in 2011, is currently in the first of nine planned phases of operation. As a phase nears its design capacity, the next phase will be constructed in order to provide available disposal capacity before the previous phase is full. The current phase (Phase 1 of 9) has a waste volume capacity of approximately 475,000 cubic feet. Existing waste volume (2019) in Phase 1 is approximately 200,000 cubic feet. The disposal rate for CWF is approximately 25,000 cubic feet per year. The remaining disposal capacity (constructed and planned) for the CWF is sufficient for the expected life of the CISF.

Hazardous waste generated by the CISF (See Response to RAI WM-4) would be sent to the Waste Control Specialists Resource Conservation and Recovery Act (RCRA) Subtitle C Landfill. The landfill is permitted to dispose of 62,370,000 cubic feet of waste over its lifetime. The facility was permitted in 1994 and has been operating for 24 years. The existing waste volume in the landfill is approximately 20,000,000 cubic feet (2019). The Landfill is constructed in phases ranging in size from approximately 3,000,000 cubic feet to 10,000,000 cubic feet. As currently constructed, the available airspace capacity is approximately 10,000,000 cubic feet (2019). New phases will be constructed as available airspace capacity is filled. The average annual receipt rate for the landfill is approximately 830,000 cubic feet. The remaining disposal capacity (constructed and planned) of the RCRA Landfill is sufficient for the expected life of the CISF.

The Lea County Landfill is the nearest municipal landfill and would be the first option for nonhazardous waste disposal. The landfill is permitted under New Mexico Solid Waste Bureau permit number SWM-130402. The facility was permitted in 1998 with a planned life of 80 years. The facility expands and constructs additional disposal area as needed. Currently, the facility has used approximately 75 acres of area for disposal with the ability to expand to 268 acres over its expected lifetime. Annual waste receipts are approximately 100,000 tons per year. ER Section 3.12.1.3, including the appropriate subsections, have been updated to include this information.

Impact:

ER Section 3.12.1.3 has been revised as described in the response.

Solid radioactive wastes would be collected in containers and temporarily stored in the transfer facility. Small volumes of solid radioactive wastes are anticipated. These low activity wastes would be disposed of at Waste Control Specialists' permitted or licensed disposal facility. *A likely location for the low activity wastes would be the WCS Low-Level Radioactive Waste (LLRW) facility's Compact Waste Facility (CWF). This disposal facility, which opened in 2011, is currently in the first of nine planned phases of operation. The facility is licensed to dispose of 9,000,000 cubic feet of waste in its lifetime and its remaining disposal capacity is sufficient for the expected life of the CISF.*

RAI WM-2

3.12.1.3.2 Non-Radioactive Solid Waste

Solid non-radioactive waste may also be generated at the CISF. The majority of the solid non-radioactive waste is expected to be generated during fabrication of some of the SNF storage systems. Approximately 3,200 storage systems would be fabricated to store 40,000 MTUs of SNF and related GTCC waste over 20 years. However, some storage systems would be fabricated offsite, but assembled at the CISF.

RAI WM-3

Other non-radioactive solid wastes are expected to be generated as a result of routine maintenance, operations, and administrative support functions at the CISF. Prior to releasing solid materials for unrestricted release, radiological surveys would be conducted to ensure that any potential levels of radioactivity are below the limits specified in *Table 3.12-1. The release levels provided in Table 3.12-1 are taken from Table R.3 of NUREG-1556, Volume 9 and Table 2 of NRC Regulatory Guide 8.30. These limits are also consistent with 30 Texas Administrative Code 336.364 Appendix G.*

Non-radiological solid waste would be disposed of at a solid waste municipal landfill. *The Lea County Landfill near Euncie, NM would be the first option for non-radioactive and non-hazardous waste disposal. The facility was permitted in 1998 and has planned life of 80 years. The remaining capacity is sufficient for the expected life of the CISF.*

RAI WM-2

RAI WM-4

3.12.1.3.3 Hazardous and Mixed Waste

Mixed waste is not expected to be generated at the CISF. Hazardous waste potentially generated at the facility will be limited to small quantities as described in Section 1.3.2.4.

Hazardous waste generated by the CISF would be sent to the WCS Resource Conservation and Recovery Act (RCRA) Subtitle C Landfill. This landfill, which opened in 1995, is currently at approximately 32% of its permitted capacity of 62,370,000 cubic feet of waste. The remaining disposal capacity is sufficient for the expected life of the CISF.

RAI WM-2

RAI WM-3

Clarify which NRC Regulatory Guide applicable to release of waste materials for disposal the application relies on.

ER Section 3.12.1.3.2 (Non-Radioactive Solid Waste) references NRC Regulatory Guide 1.86 for limits applicable to releasing waste materials for disposal. NRC Regulatory Guide 1.86 has been retired, but similar limits are referenced in Regulatory Guide 8.30. The commitments to follow NRC guidance in the application should reflect the currently applicable guidance.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-3:

ER Section 3.12.1.3.2 has been revised to add Table 3.12-1,which provides the acceptable surface contamination levels for uncontrolled release of materials and equipment that were formerly included in NRC Regulatory Guide (RG) 1.86 and Table 1.

Discussion:

As noted in the RAI, NRC RG 1.86 was withdrawn on August 12, 2016. According to the Federal Register Notice (NRC-2016-0160) withdrawing the RG 1.86, ". . .Table 1 in RG 1.86 is now included in RG 8.23 and is titled, 'Table 3 Acceptable Surface Contamination Levels for Uncontrolled Release of Equipment.'"

RG 8.23 was also withdrawn on August 7, 2018. NRC guidance applicable to Radiation Safety Surveys at Medical Institutions in RG 8.23 is now available in Table R.3 of NUREG-1556, Volume 9. Table R.3 *Surface Contamination Levels in Unrestricted Areas (dpm/100 cm^2)* contains similar release levels as those formerly included in RG 1.86 Table 1 and RG 8.23 Table 3. Uranium and associated decay products, Transuranics, and Thorium are no longer addressed in Table R.3 of NUREG-1556 Volume 9. These radioactive materials are now addressed in Table 2 of RG 8.30, applicable to Uranium recovery facilities, which only includes these types of materials, not Beta-gamma emitters, etc.

Finally, the state of Texas also includes Acceptable Surface Contamination Levels for releasing material to unrestricted use in 30 Texas Administrative Code 336.364 Appendix G. The Table in §336.364, Appendix G is consistent with the RG 1.86 Table 1 with the exception that it combines Transuranics, Ra-226, Ra-228, Th-230, Th-228, pa-231, Ac-227, I-125 and I-129 with the other alpha emitters in the RG table and treats these radionuclides consistent with other alpha emitters.

Therefore, including Table 3.12-1 in the ER is appropriate and the contamination limits specified therein are consistent with the current NRC guidance and Texas Administrative Code limits discussed above.

Impact:

ER Section 3.12.1.3.2 has been revised and Table 3.12-1 has been added as described in the response.

Solid radioactive wastes would be collected in containers and temporarily stored in the transfer facility. Small volumes of solid radioactive wastes are anticipated. These low activity wastes would be disposed of at Waste Control Specialists' permitted or licensed disposal facility. *A likely location for the low activity wastes would be the WCS Low-Level Radioactive Waste (LLRW) facility's Compact Waste Facility (CWF). This disposal facility, which opened in 2011, is currently in the first of nine planned phases of operation. The facility is licensed to dispose of 9,000,000 cubic feet of waste in its lifetime and its remaining disposal capacity is sufficient for the expected life of the CISF.*

RAI WM-2

3.12.1.3.2 Non-Radioactive Solid Waste

Solid non-radioactive waste may also be generated at the CISF. The majority of the solid non-radioactive waste is expected to be generated during fabrication of some of the SNF storage systems. Approximately 3,200 storage systems would be fabricated to store 40,000 MTUs of SNF and related GTCC waste over 20 years. However, some storage systems would be fabricated offsite, but assembled at the CISF.

RAI WM-3

Other non-radioactive solid wastes are expected to be generated as a result of routine maintenance, operations, and administrative support functions at the CISF. Prior to releasing solid materials for unrestricted release, radiological surveys would be conducted to ensure that any potential levels of radioactivity are below the limits specified in *Table 3.12-1. The release levels provided in Table 3.12-1 are taken from Table R.3 of NUREG-1556, Volume 9 and Table 2 of NRC Regulatory Guide 8.30. These limits are also consistent with 30 Texas Administrative Code 336.364 Appendix G.*

Non-radiological solid waste would be disposed of at a solid waste municipal landfill. *The Lea County Landfill near Euncie, NM would be the first option for non-radioactive and non-hazardous waste disposal. The facility was permitted in 1998 and has planned life of 80 years. The remaining capacity is sufficient for the expected life of the CISF.*

RAI WM-2

Table 3.12-1, Acceptable Surface Contamination Levels for Uncontrolled Release of Material

NUCLIDE[a]	AVERAGE[b c]	MAXIMUM[b d]	REMOVABLE[b e]	REFERENCE
U-nat, U-235, U-238, and associated decay products	5,000 dpm α / 100 cm^2	15,000 dpm α / 100 cm^2	1,000 dpm α / 100 cm^2	Table 2 of RG 8.30 (Revision 1)
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm / 100 cm^2	300 dpm / 100 cm^2	20 dpm / 100 cm^2	Table R.3 of NUREG-1556, Volume 9 (Revision 2)
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm / 100 cm^2	3,000 dpm / 100 cm^2	200 dpm / 100 cm^2	Table R.3 of NUREG-1556, Volume 9 (Revision 2)
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and other noted above.	5,000 dpm β-γ / 100 cm^2	15,000 dpm β-γ / 100 cm^2	1,000 dpm β-γ / 100 cm^2	Table R.3 of NUREG-1556, Volume 9 (Revision 2)

NOTES:

a. Where surface contamination by both alpha- and beta-gamma-emitting nuclides exists, the limits established for alpha- and beta-gamma-emitting nuclides should apply independently.

b. As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

c. Measurements of average contaminate should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

d. The maximum contamination level applies to an area of not more than 100 cm^2.

e. The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

All Indicated Changes are in response to RAI WM-3

RAI WM-4

ISP should clarify ER statements about whether hazardous waste would be generated by the proposed action.

ER Section 1.3.2.4 (Pollution Prevention and Waste Management) states that small quantities of hazardous wastes would be generated and are expected to be much less than 100 kg in a month. This information appears to conflict with the statement in ER Section 3.12.1.3 (Solid Wastes) that indicates mixed and hazardous waste is not expected to be generated at the CISF. If hazardous waste is generated by the proposed action, ISP should clarify if the hazardous waste would be disposed at the adjacent WCS Resource Conservation and Recovery Act (RCRA) facility.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI WM-4:

Mixed wastes are not expected to be generated at the CISF. Small quantities of potentially hazardous waste may be generated as stated in ER Section 1.3.2.4. ER Section 3.12.1.3 has been updated to be consistent with ER Section 1.3.2.4. Hazardous waste generated at the CISF would be disposed of at the adjacent Waste Control Specialists Resource Conservation and Recovery Act (RCRA) facility. In addition to the Waste Control Specialists RCRA facility, there are currently two additional RCRA permitted facilities in the state of Texas and at least 20 permitted facilities nationwide.

ER Section 3.12.1.3, and appropriate subsections, have been updated to include this additional information.

Impact:

ER Section 3.12.1.3 has been revised as described in the response.

Only very low levels of the above constituents are expected in CISF conventional wastewater. The non-reactive liquid waste streams shall be managed and would potentially be released to the environment at the CISF only in accordance with federal and state requirements (e.g., a TPDES Permit issued by the TCEQ).

3.12.1.2.2 Sanitary Wastes

Sanitary wastes generated at the CISF include the effluents from facility drinking water fountains, water closets, lavatories, mop sinks, and other similar fixtures. Sanitary waste generated at the CISF would be transferred to aboveground holding tanks, prior to discharge in a permitted POTW.

3.12.1.3 Solid Wastes

LLRW, *hazardous,* and non-radioactive solid waste may be generated at the CISF. Mixed waste is not expected to be generated at the CISF.

3.12.1.3.1 Solid Low-Level Radioactive Waste

The CISF would be designed, and procedures developed, to minimize the volumes of solid LLRW generated at the CISF in accordance with 10 CFR 20.1406, *Minimization of Contamination*, and 10 CFR 72.130, *Criteria for Decommissioning*.

Solid radioactive wastes may be generated at the CISF as a result of cask contamination surveillance and decontamination activities. These wastes generally consist of paper or cloth swipes, paper towels, protective clothing, and other job control wastes contaminated with low levels of radioactivity. Expended HEPA filters from the transfer facility ventilation system along with job control waste associated with filter change-out, also may contribute to the generation of solid radioactive waste. Job control waste generated during filter change-out is collected and monitored along with other low-level wastes for off-site processing.

All Indicated Changes are in response to RAI WM-4

RAI WM-4

3.12.1.3.3 Hazardous and Mixed Waste

Mixed waste is not expected to be generated at the CISF. Hazardous waste potentially generated at the facility will be limited to small quantities as described in Section 1.3.2.4.

Hazardous waste generated by the CISF would be sent to the WCS Resource Conservation and Recovery Act (RCRA) Subtitle C Landfill. This landfill, which opened in 1995, is currently at approximately 32% of its permitted capacity of 62,370,000 cubic feet of waste. The remaining disposal capacity is sufficient for the expected life of the CISF.

RAI WM-2

CUMULATIVE IMPACTS (CI)

RAI CI-1

Identify and describe past, present, and reasonably foreseeable future actions that may result in a potential for cumulative environmental impacts within an 80-km [50-mi] radius of the proposed CISF.

ER Section 2.6 provides a description of present actions within a 48-km [30-mi] radius of the proposed CISF that have a potential for cumulative environmental impacts. However, other past, present, and reasonably foreseeable future actions within and outside an 80-km [50-mi] radius of the proposed CISF have the potential for cumulative environmental impacts. For example, oil and gas development and production activities, livestock grazing, renewable energy projects (e.g., wind and solar farms), and a number of reasonably foreseeable future actions (e.g., the proposed Eddy Lea Energy Alliance/Holtec CISF, the Ochoa Potash Mine Project, and the DK Disposal E & P Landfill and Processing Facility) all have the potential for cumulative environmental impacts. The requested information is needed to support the NRC staff's evaluation of cumulative impacts in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(c), which requires that the ER contain an analysis of cumulative impacts that may result from the proposed action.

Response to RAI CI-1:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

RAI CI-2

Provide additional information to support the analysis of cumulative impacts of both nuclear and non-nuclear past, present, and reasonably foreseeable future activites for all resource areas.

The analysis of cumulative impacts presented in ER Section 2.6 is limited to brief statements regarding (i) air quality attributable to expansion of the WCS-Controlled Compact Waste Facility and Federal Waste Facility, operations at Permian Basin Materials, and manufacture of concrete at WCS's existing concrete batch plant; (ii) competition for and use of aggregate, crushed rock, and other mineral resources; and (iii) radiological doses attributable to the nearby URENCO USA uranium enrichment facility and WCS's low-level radioactive waste disposal facilities. To support the NRC staff's analysis of the potential cumulative impacts of the proposed action, address potential cumulative impacts relevant to all resource areas, including an evaluation with supporting information of the environmental impacts of nuclear acitivities (e.g., URENCO USA, WCS's low-level radioactive waste facilities, and the proposed Eddy Lea Energy Alliance/Holtec CISF) and non-nuclear activities (e.g., oil and gas exploration and development, potash mining, and livestock grazing) within an 80-km [50-mi] radius of the proposed CISF. The requested information is needed to support the NRC staff's evaluation of cumulative impacts in the EIS.

This additional information is needed in accordance with 10 CFR 51.45(c), which requires that the ERs contain an analysis of cumulative impacts that may result from the proposed action.

Response to RAI CI-2:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

ENVIRONMENTAL MEASURES AND MONITORING (EMM)

RAI EMM-1

Provide additional information on the proposed pre-operational and operational Radiological Monitoring Program for the proposed CISF. The additional information should include:

- Media or effluents to be sampled.
- Number and location of sample collection points, including distal control sample collection points.
- Radiological measuring devices or methods of analysis and the radiological constituents to be analyzed, including lower limits of detection.
- Procedures/protocols for sample collection (e.g., sample size, sample collection frequency, and sampling duration), handling, preservation, and transport.
- Discussion that justifies the choice of sample locations, analyses, frequencies, duration, sizes, and lower limits of detection.

ER Section 6.3 provides a limited discussion and few details about the pre-operational and operational Radiological Monitoring Program for the proposed CISF. Specifically, the additional information is needed to support the NRC staff's description of the applicant's pre-operational and operational Radiological Monitoring Program and the NRC staff's environmental evaluation of the adequacy of radiological monitoring activities for the proposed CISF to demonstrate compliance with the requirements in 10 CFR 72.104 (Criteria for radionuclide material in effluents and direct radiation from an ISFSI or MRS).

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI EMM-1:

Information concerning the pre-operational Radiological Monitoring Program is included in ER Section 4.12.2.3, which states that "[Interim Storage Partners] joint venture member Waste Control Specialists conducts a comprehensive environmental sampling and analysis program, commonly referred to as the consolidated REMP." "As part of the Radiological Environmental Monitoring Program (REMP), samples of media and effluents, including gases and vapor, air particulates, soil, sediment, fauna, vegetation, surface water, waste waters, and groundwater, are collected and analyzed. A monitoring network of OSLs is also used to measure ambient gamma radiation. The sampling media and sampling locations included in the REMP provide a measure of the routine operations within and around the facility and monitor the potential impact of the facility operations on the off-site environment, including the general public." ER Section 6.3 has been updated to reflect the use of sample data collected as part of the existing Waste Control Specialists REMP for use as part of the pre-operational Radiological Monitoring Program for the proposed CISF.

WCS CISF SAR Section 9.6.2.4 was updated as a part of the responses to RAIs NP-9-3 and NP-9-4 and now provides specific information on the Radiological Monitoring Program including 1) number of samples; 2) sample locations; 3) collection frequency; 4) sample analysis to be performed; and 5) sample analysis frequency. The WCS CISF SAR also references the figures in ER Chapters 4 and 6 for the current monitoring locations and the proposed CISF OCA dosimeter monitoring locations.

The bulleted list below provides responses to each of the bulleted items included in the RAI.

- Media or effluents to be sampled are air, soil and ambient radiation as stated in Section 9.6.2.4 of the WCS CISF SAR.

- Number and location of sample collection points, including distal control sample collection points are as indicated on ER Figure 6.1-1. An additional four optically stimulated luminescence (OSL) locations and two soil sample locations are being proposed for the CSIF to supplement the existing Waste Control Specialists REMP sampling locations indicated in ER Figures 4.12-7 through 4.12-12. Three existing OSL locations are shown in ER Figure 6.1-1; there are two existing soil sample locations and three existing air sample locations that are co-located with these existing OSL locations. These three existing air locations will be the air monitoring locations for the CISF in addition to the operational air monitoring within the Cask Transfer Building. With the two existing soil sample locations and three existing OSL locations, there will be a total of six soil sample locations and seven OSL locations proximal to the CISF (not counting the other Waste Control Specialists REMP sampling locations more distant). The distal control sample location (air, soil and ambient/OSL) is three miles east of the Waste Control Specialists Facility on the south side of State Highway 176 as indicated in the bottom right corner of ER Figures 4.12-7, 4.12-9, and 4.12-10. ER Figure 6.1-1 has been updated to reflect the updated path of the rail spur to the proposed CISF. ER Figures 4.12-7 through 4.12-12 show the locations of the various types of environmental samples that are collected at Waste Control Specialists. One of the background locations (Station 9) is located in the bottom right corner of Figures 4.12-7, 4.12-9 4.12-10 and 4.12-12.

- Radiological measuring devices or methods of analysis and the radiological constituents to be analyzed, including lower limits of detection: WCS CISF SAR Section 9.8 was added in response to RAI NP-9-5 and it provides the radiological measuring devices to be used on-site and the specifications including the lower limits of detection. Methods of analysis will be per EPA SW846 methodology and the requirements of the Department of Energy (DOE) "Environmental Measurement Laboratory Manual" (HASL 300, DOE 1997) and analysis will be performed at an approved NELAC/NELAP laboratory. ER Section 6.3 has been updated to provide reference to the radiological measurement device specifications as updated in response to RAI NP-9-5, and reflect the methods of analysis for data collected as part of the proposed CISF Radiological Monitoring Program.

- Procedures/protocols for sample collection (e.g., sample size, sample collection frequency, and sampling duration), handling, preservation, and transport will be those currently established under the existing Waste Control Specialists REMP, in accordance with EPA SW846 analytical methods and the requirements of Department of Energy (DOE) "Environmental Measurement Laboratory Manual" (HASL 300, DOE 1997), with analysis performed at an approved NELAC/NELAP laboratory. ER Section 6.3 has been updated to reflect the procedures/protocols for sample collection as outlined in SAR Section 9.6.2.4, itself updated in response to RAIs NP-9-3 and NP-9-4.

- Discussion that justifies the choice of sample locations, analyses, frequencies, duration, sizes, and lower limits of detection: Justification is discussed in ER Section 4.12.2.2, which determined that the only significant radiological exposure pathway impacting human health or the environment at the CISF during normal operations is from external sources of gamma-rays and neutrons resulting from radioactive decay of irradiated fuel. All other radiological pathways, such as air, drinking water, soil ingestion, milk, and other foodstuff are not applicable. Additionally, no credible accidents were identified that result in a release of radioactive materials to the environment and thereby expose members of the public as discussed in Chapter 12 of the WCS CISF SAR. Based on this discussion, the choice of locations, analyses and frequencies were determined and stated in SAR Section 9.6.2.4. ER Section 6.3 has been updated to reference this discussion. Finally ER Section 9.0 was updated to include the WCS CISF SAR as a reference used in ER.

Impact:

ER Sections 6.3 and 9.0 and Figure 6.1-1 have been revised as described in the response.

Though no pathways exist for exposures due to liquid effluents, administrative investigation and action levels are established for monitoring surface water runoff as an additional step in the radiation control process. Because the surface water drainage paths are normally dry, it is not possible to monitor runoff in a continuous or batch mode basis. Even if surface water were sampled, the radionuclide levels would likely be so low as to be statistically insignificant. Instead, quarterly soil sampling coupled with weekly/monthly radiological surveys on the casks and storage pad would be conducted.

There are no connections to municipal sewer systems. Onsite sewage would be routed to holding tanks, which are periodically pumped; the sewage would then be sent offsite for disposal in a POTW. Each holding tank would be periodically sampled (prior to pumping) and analyzed for relevant radionuclides.

6.3 RADIOLOGICAL MONITORING PROGRAM

The Radiological Monitoring Program includes the collection of data during pre-operational years in order to establish baseline radiological information that would be used in determining and evaluating potential impacts from CISF operations on the local environment. *Due to the fact that half of the CISF will be within the permitted boundary of the current WCS facility, the pre-operational monitoring is basically complete. Combined with the pre-operational data of the three WCS facilities and the current operational data, there is an extensive amount of data to determine any impact from the addition of the CISF.* The Radiological Monitoring Program would be initiated at least one year prior to CISF operations. The early initiation of the Radiological Monitoring Program provides assurance that a sufficient environmental baseline has been established for the CISF before the arrival of the first cask shipment. Radionuclides in environmental media would be identified using *methods of analysis in accordance with EPA SW846 methodology and the requirements of the Department of Energy (DOE) "Environmental Measurement Laboratory Manual" (HASL 300, DOE 1997). Analysis will be performed at an approved NELAC/NELAP laboratory.* Data collected during the operational years would be statistically compared to the baseline generated by the pre-operational data. Such comparisons provide a means of assessing the magnitude of potential radiological impacts on members of the public and in demonstrating compliance with applicable radiation protection standards.

All Indicated Changes are in response to RAI EMM-1

As discussed in Chapter 4, Section 4.12.2.2, a bounding evaluation of off-site doses for a 40,000 MTU facility loaded in eight phases was conducted. The evaluation looked at two scenarios: 1) eight phases consisting of NUHOMS® HSMs arranged in three rows of 144 back-to-back HSMs containing 5,000 MTU in each phase (See Figure 4.12-4); and 2) eight phases consisting of NAC Vertical Concrete Casks (VCC) arranged in nine 4 x 9 arrays of casks containing 5,000 MTU in each phase (See Figure 4.12-5). The purpose of the dose calculations was to determine the impact to human health from radiation emitted from the HSMs and VCC containing up to 40,000 MTU of SNF and related GTCC waste. The design-basis of the HSMs and VCC, where canisters containing SNF are welded and sealed, prevents the release of radioactive materials into the environment. Accordingly, the only significant radiological exposure pathway impacting human health or the environment at the CISF during normal operations is from external sources of gamma-rays and neutrons resulting from radioactive decay of irradiated fuel. All other radiological pathways such as air, drinking water, soil ingestion, milk, and other foodstuff are not applicable. Additionally, no credible accidents were identified that result in a release of radioactive materials to the environment and thereby expose members of the public as discussed in Chapter 12 of the SAR. Based on the discussion above, the choice of locations, analyses, and frequencies were determined and stated in Chapter 9, Section 9.6.2.4 of the revised SAR.

Direct radiation in offsite areas emanating from fuel stored on the dry cask storage pad or resulting from cask handling operations is expected to be minimal, see Section 4.12.2 of this ER. However, TLDs or OSLs would be placed strategically around the CISF perimeter to measure these potential exposures and demonstrate regulatory compliance. *Waste Control Specialists uses the Luxel+ Ta (beta/photon/neutron) dosimeter for area monitoring under the radiation safety area monitoring program (minimum of eight locations on the inner fence of the PA) and the Landauer Inlight® Environmental X9 (beta/photon) dosimeter for the perimeter environmental monitoring program at the OCA boundary (for reference, see ER Figure 6.1-1). All dosimeters will be analyzed on a quarterly basis. Environmental boundary air and soil monitoring (i.e., Low Volume air sampling or High Volume air sampling) will be performed at a minimum of two locations on the north OCA boundary (for reference see Figures 4.12-7 and 4.12-9 in ER Chapter 4) in addition to the locations currently performed under the REMP. Analyses will be for gross alpha/beta and gamma spectrometry and performed by a*

All Indicated Changes are in response to RAI EMM-1

certified offsite laboratory. Air samples will be collected monthly for each location and composited for a quarterly analysis. Soil samples will be collected and analyzed annually unless air samples indicate the need to take additional samples.

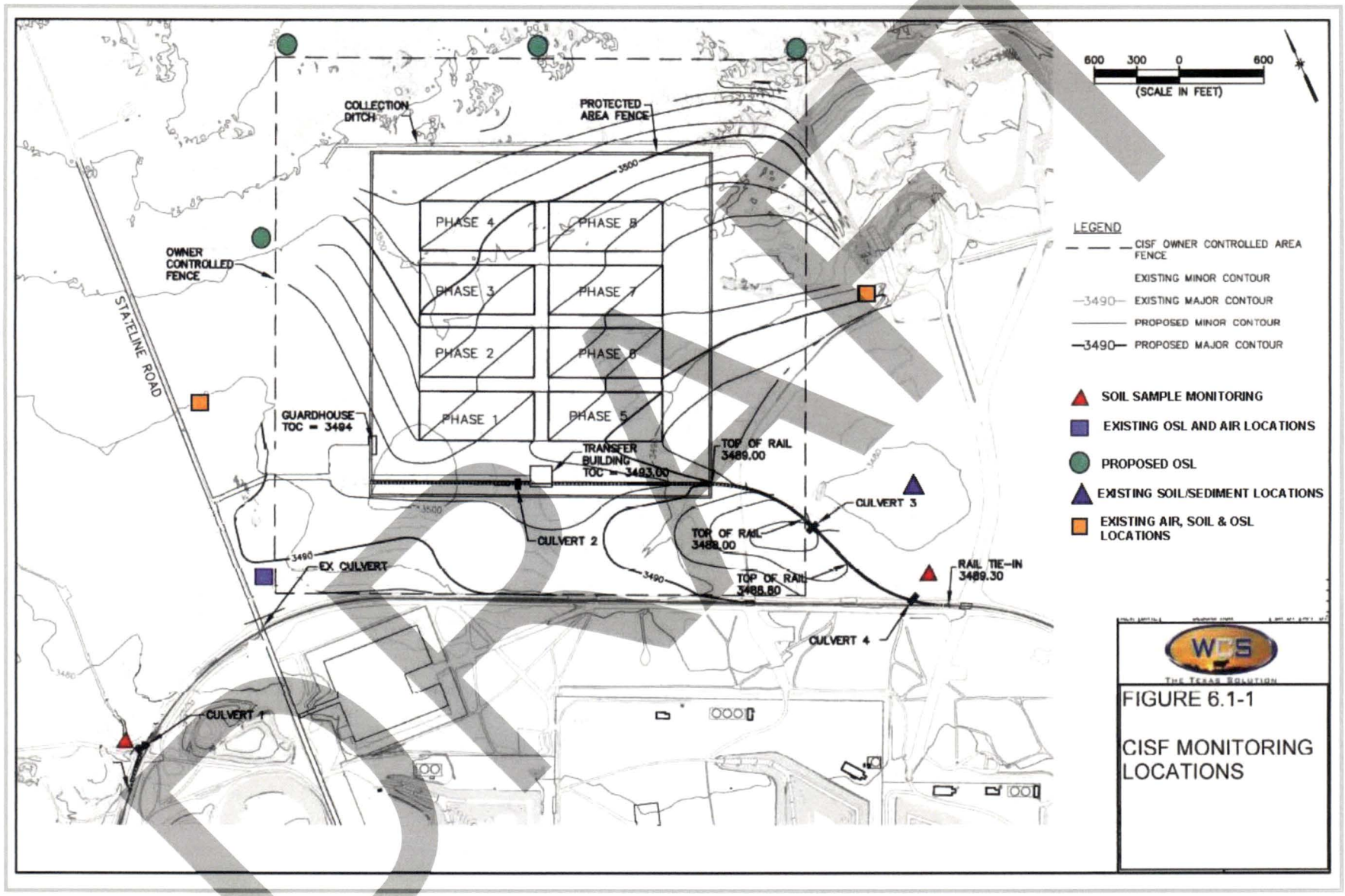
Detection of radionuclide impacts to surface water runoff would be conducted in a two-step process. First, all casks would be checked for surface contamination during *acceptance procedures and surveys, then* all storage pads would be checked for surface contamination during monthly surveys. Second, soil samples would be collected on *an annual* basis at the culverts leading to the CISF outfalls. *Although not expected due to welded and sealed dry stored canisters, monitored* radioactive contaminants exceeding the action levels, as established in written procedures, would cause an immediate investigation and would require corrective action to protect human health and prevent future recurrences.

During the course of facility operations, revisions to the Radiological Monitoring Program may be necessary and appropriate to assure reliable sampling and collection of environmental data. The rationale and actions behind such revisions to the program would be documented and reported to the NRC and other appropriate regulatory agency, as required. Sampling focuses on locations proximate to the facility, but may also include distant locations as control sites. Potential sample locations have been identified, but are subject to change based on NRC guidance, meteorological information, ISP joint venture member Waste Control Specialists' extensive experience in environmental sampling in the area, and current land use, see figure 6.1-1.

6.4 COMPLIANCE WITH REGULATORY REQUIREMENTS

Compliance with 10 CFR §20.1301 is demonstrated using a calculation of the TEDE to the individual who is likely to receive the highest dose in accordance with 10 CFR 20.1302(b)(1). Appropriate models, codes, and assumptions that accurately represent the facility, the site and the surrounding area support the determination of the TEDE by pathway analysis.

Compliance is demonstrated through boundary monitoring and environmental sampling data. If a potential release should occur, then routine operational environmental data would be used to assess the extent of the release.



All Indicated Changes are in response to RAI EMM-1

Institute, N. E. (2015). Retrieved from Policy Brief: Nuclear Energy Industry Supports a Sustainable, Integrated Used Nuclear Fuel Management : http://www.nei.org/Prints?printpath=/Master-Document-Folder/Backgrounders/Policy-Briefs/Nuclear-Energy-Industry-Supports-a-Sustainable,-In&classname=custom.document&pNm=PolicyBriefs

Jablon, S., Hrubec, Z., & and Boice Jr, J. (1991). Cancer in Populations Living Near Nuclear Facilities: A Survey of Mortality Nationwide and Incidence in Two States. JAMA. 265(11):1403-1408.

RAI EMM-1

Interim Storage Partners (ISP 2019). WCS Consolidated Interim Storage Facility System Safety Analysis Report, NRC Docket No. 72-1050, Revision 3.

RAI NOI-2

ISO. (1996). (International Organization for Standardization). Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation. December 1996.

Jablon, S., Hrubec, Z., Boice Jr, J., & and Stone, B. (1990). Cancer in Populations Living Near Nuclear Facilities. Public Health Service, U.S. Department of Health and Human Services. Bethesda, Maryland: NIH Publication 90-874.

Jackson, T. O. (2001). The Effect of Previous Environmental Contamination on Industrial Real Estate Prices. The Appraisal Journal, 200-210.

Jones, I. (2001). Cenozoic Pecos Alluvium Aquifer. Aquifers of West Texas. Texas WatDevelopment Board Report 356, ed. R.E. Mace, W.F. Mullican III, and E.S. Angle, p. 120-134.

Joyce, E. (2015). Solar Project Planned at Former California Nuclear Power Plant Site. Capital Public Radio. September 10, 2015.

Kirk, J. S. (2015, August 27). Teleconference with Judge Skeet Jones on Loving County, Texas Site.

Learn, S. (2011). Transfer spent fuel at Trojan closed nuclear plant to interim site, commission says. The Oregonian. Published on August 01, 2011.

Lehman, T. (1994b). Save the Dockum Group!: West Texas Geological Society. Bulletin 34(4), p. 5-10.

Lehman, T. (1994a). The Saga of the Dockum Group and the Case of the Texas/New Mexico Boundary Fault: New Mexico Bureau of Mines and Mineral Resources. Bulletin 150, p. 37-51.

Libow, G. (2001). Land Sale for Power Plant Stalled. Tribune Digital – The Courant. October 12, 2001.

COST–BENEFIT (CB)

RAI CB-1

Revise the quantitative cost and benefit estimates in ER Chapter 7 to include discounting and provide details and assumptions (e.g., a project schedule by year specifying when activities occur) or provide a basis for not doing so for any of the cost factors.

Discounting was not used for any of the estimated costs and benefits of the proposed action and no-action alternative presented in ER Chapter 7. ER Section 7.2.1 explains that discounting was not used because ISFSI operations include substantial labor, technological, and regulatory compliance expenditures, and it was assumed that these expenses remain relatively constant. The justification for not discounting appears to focus only on ISFSI operational costs associated with the eliminated storage costs presented in ER Section 7.2.1. However, this only represents one of the three key cost factors presented in the analysis and the nature of the other two costs is somewhat different than the ISFSI operation cost. The cost for the development of the CISF and relocation of SNF described in ER Section 7.3 includes significant capital and infrastructure costs (see ER Table 7.4-2). The cost-benefit analysis for the repurposed land in ER Section 7.2.2 accounts for the future estimated value of the land at decommissioned-nuclear-purposed land once the license is terminated (see ER Table 7.2-6). The net benefit calculation in ER Section 7.4.1 uses the undiscounted values from all three of these key qualitative estimates. Discounting is appropriate when analyzing this proposed action because of the 40-year timeframe and the nature of some of the costs. Specifically, discounting the quantitative estimates is needed to support the description of the costs and benefits in the NRC's EIS. Discounting requires specifying the timing (i.e., the specific years) in which activities occur. Key "high dollar" activities include the construction, operation, and decommissioning of the CISF as well as the SNF transportation. The details and assumptions associated with the calculation (e.g., a project schedule by year specifying when activities occur) are needed to support NRC's staff's understanding of how the discounting calculations were performed and for evaluation of cost and benefits of the proposed action and no-action alternative.

The requested information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include consideration of the benefits and costs of the proposed action and its alternatives as well as contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-1:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

RAI CB-2

Clarify and supplement the SNF transportation schedule and associated assumptions as appropriate in the ER to

- Ensure the SNF transportation schedule and associated assumptions used for the cost benefit analysis are consistent with this information, as described in other parts of the ER or revise the analyses accordingly.
- To the extent it is known, provide greater detail for the assumptions for the shipment of SNF to the proposed CISF in future potential expansions of the CISF beyond the currently proposed 5000 MTU's ER Section 7.2.1 describes that SNF transport occurs over a 31 year period. ER Section 4.2.7.1 states that the SNF would be transported over a 20 year period, assuming up to 200 canisters of SNF being transported to the CISF annually. The detailed assumptions for the SNF transport in ER Section 7.2.1 address the initial transportation at a greater level of detail than the potential future expansion (e.g., ER Table 7.2-3).

This information is needed in accordance with 10 CFR 51.45(b) and 10 CFR 51.45(c), which require that the ER include a description of the proposed action and sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-2:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

RAI CB-3

Provide additional information, supplement the calculation and associated assumptions for the total SNF storage costs presented in ER Table 7.2-2. This should include the following:

- Provide the detailed calculation and associated assumptions for the total SNF storage cost for both potential future expansions (all eight phases) and no action currently presented in ER Table 7.2-2.
- Supplement the current information in ER Table 7.2-2 to provide the cost estimates for implementing just phase 1 (i.e., the initial license request) and the detailed calculation and associated assumptions or provide a basis for not doing so.
- Supplement ER Table 7.2.2 to also include cost estimates, which assume no additional reactors are shutdown (i.e., use an annual cost of storing SNF for an operating reactor) and revise the cost benefit analyses in ER Chapter 7 accordingly or provide a basis for not doing so.
- Identify the reference for the statement in ER Section 7.2 that by 2053 there will be a total of 71 shutdown reactor sites in the United States according to NRC data (see AIN-1).

ER Table 7.2-2 contains the assumed total cost of storing SNF storage at the various generation sites over the 40 years (i.e., the proposed CISF 40-year license period) for both the full build out (i.e. all eight phases) (with a CISF) and no-action alternative (without a CISF). The difference between these two values is the avoided reimbursement cost. ER Section 7.2.1 provides a general description on how these values were calculated based on the transition of SNF from the current storage locations to the proposed ISP site. However, the ER does not provide sufficient information for the NRC staff to determine exactly how the particular values in Table 7.2-2 (and the associated Figure 7.2-1) were calculated. ER Table 7.2-2 also does not provide the cost estimate information for just phase 1 (i.e., the initial license request).

ER Table 7.2-2 assumes an annual cost of storing SNF at each generation site based on this activity occurring at a shutdown reactor. NRC staff requests that this table be supplemented to also include estimates assuming an annual cost of storing SNF based on this activity occurring at an operating reactor (i.e., no additional reactors are shut down). Using an annual storage cost based on a value for an operating reactor could alter the estimated benefit as calculated in ER Table 7.2-2. NRC staff consider this an important component for characterizing the costs and benefits. As requested in this RAI for the current estimate in ER Table 7.2-2, provide the detailed calculation and associated assumptions for the calculation so NRC staff can follow exactly how theses cost estimates were generated. Specifically, this additional information is needed to support NRC staff's description of the total cost for the proposed action and the no-action alternative in the NRC's EIS.

The requested information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include consideration of the benefits and costs of the proposed action and its alternatives as well as contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-3:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

RAI CB-4

Provide additional information, supplement the descriptions in ER Section 7.3 concerning the calculation, and associated assumptions for the costs of constructing, operating, and decommissioning the facility. This should include the following:

- Supplement the current information to provide the cost estimates for implementing just phase 1 (i.e., the initial license request) or provide a basis for not doing so.
- Clarify whether the staffing estimates in ER Table 7.3-10 represent the total number of employees supporting the ISP operations or only the additional new hires augmenting the existing WCS staff.

ER Section 7.3 explains that the costs for developing the proposed CISF, relocating the SNF to this facility, and operating the ISFSI incorporates the assumptions and cost estimates from a 2009 EPRI report (EPRI, 2009) and adjusts values, where appropriate, for the circumstances of the proposed CISF. However, the cost estimates in ER Section 7.3 appear to include future expansions (i.e. all eight phases) and do not include such estimates for just phase 1 (i.e., the initial license request). It is unclear whether the staffing estimates in Table 7.3-10 represent the total number of employees supporting the ISP operations or only the new employees augmenting the existing WCS staff. Specifically, this additional information is needed to support the NRC staff's description of the total cost for developing the proposed CISF, relocating the SNF to this facility, and operating this facility in the NRC's EIS.

The requested information is needed in accordance with 10 CFR 51.45(c), which requires that the ER include consideration of the benefits and costs of the proposed action and its alternatives as well as contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI CB-4:

Draft response will be provided in a separate submittal in the near future.

Impact:

To be finalized.

REFERENCED INFORMATION

RAI RI-1

Provide an electronic copy or active website link to the final version of WCS's "Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste" (dated 2007).

Citations in the ER indicate that relevant information and studies can be found in WCS's "Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste" (dated 2007). The requested information is needed to confirm information presented in the ER and to support NRC's evaluation of environmental impacts in the EIS.

This information is needed in accordance with 10 CFR 51.45(c), which requires ERs to contain sufficient data to aid the NRC in its development of an independent analysis.

Response to RAI RI-1:

An electronic copy of the applicable portions of the final version of Waste Control Specialists' "Application for License to Authorize Near Surface Land Disposal of Low-Level Radioactive Waste" (dated 2007) is provided in Enclosure Z. The portions provided include:

1. Appendix 2.3.1: Meteorological and Climatology Data
2. Appendix 2.3.1-2: Meteorological System
3. Figures 5-10 and 5-10a of Appendix 2.6.1
4. Attachment 2-1 to Appendix 2.6.1.pdf
5. Attachment 6-4 (Water Quality Analysis Of Baker Spring Ponded Water, November 2004) to Appendix 2.6.1
6. Attachment 6-6 (Groundwater Age Dating) to Appendix 2.6.1
7. Appendix 2.9.1: Ecological Assessment
8. Section 2.4.2 (Transportation Impact Analysis) of Attachment A to Appendix 11.1.1.
9. Figures 1 through 14 of Attachment A to Appendix 11.1.1
10. Appendix 11.9.2: Ecological Baseline Assessment

Impact:

No change as a result of this RAI.

Proprietary Information in Attachment LU-2-1 (42 pages)
Withheld Pursuant to 10 CFR 2.390.

Proprietary Information in Attachment WR-5-1 (80 pages)
Withheld Pursuant to 10 CFR 2.390.

Attachment WR-5-2

2007 search conducted by Waste Control Specialists and Banks Environmental Data Inc for water wells within 10 km of the WCS Low Level Radioactive Waste Facility.

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322650103041901	NM	6	103.07194	32.44722	Unknown	60	Unknown	Unused
322613103042002	NM	7	103.07222	32.43694	Unknown	Unknown	Unknown	Stock
322613103042001	NM	7	103.07222	32.43694	Unknown	Unknown	Unknown	Stock
26-40-201	TX	8	103.04444	32.46028	Ed Tinsley	Unknown	01/21/1990	Stock
26-40-602	TX	13	103.03139	32.42778	Flying W Diamond Ranch	80	01/21/1990	Stock
26-40-601	TX	13	103.03500	32.42750	Bill Vance	Unknown	01/21/1990	Stock
26-40-6B	TX	25	103.01114	32.44367	Ralph McWhorter	85	10/13/1978	Domestic
CP 00139	NM	30	103.09200	32.46704	Marion and William O. Stephens	Unknown	Unknown	Stock
322747103052701	NM	30	103.09083	32.46306	Stephens, Wayne and William O.	43	Unknown	Stock
CP 00705	NM	33	103.08557	32.47433	Unknown	Unknown	Unknown	Domestic
CP 00705	NM	33	103.08557	32.47433	Unknown	Unknown	Unknown	Domestic
CP 00678	NM	33	103.08662	32.47521	Unknown	125	6/24/1985	Domestic
CP 00660	NM	33	103.08348	32.47250	Hard B. Tapp	Unknown	12/20/1982	Domestic
CP 00650	NM	33	103.08662	32.47521	Seth Brown	155	5/19/1982	Domestic
26-40-6A	TX	34	103.01076	32.41932	Ralph McWhorter	68	08/25/1978	Domestic
26-40-901	TX	38	103.01778	32.41194	Ed Tinsley	Unknown	01/21/1990	Stock
322552103065701	NM	43	103.11583	32.43111	Wallach, P.	Unknown	Unknown	Stock
CP 00188	NM	44	103.10917	32.41445	George W. Sims	Unknown	Unknown	Domestic
322446103062501	NM	44	103.10694	32.41278	Unknown	Unknown	Unknown	N/A
322438103063901	NM	44	103.11083	32.41056	Sims, George	55	Unknown	Commercial
322928103050401	NM	45	103.08444	32.49111	Elliot Oil Co.	1200	Unknown	Commercial
322759103080301	NM	47	103.13417	32.46639	Skelly Oil Co.	Unknown	Unknown	Other
322752103080201	NM	47	103.13389	32.46444	Skelly Oil Co.	79	Unknown	Other
322746103081401	NM	47	103.13722	32.46278	Skelly Oil Co.	90	Unknown	Other
322746103080001	NM	47	103.13333	32.46278	Skelly Oil Co.	84	Unknown	Other
322738103075901	NM	47	103.13306	32.46056	Skelly Oil Co.	81	Unknown	Other

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322737103080101	NM	47	103.13361	32.46028	Owen, Jim	80	Unknown	Commercial
322527103070301	NM	47	103.11750	32.42417	Wallach, P.	58	Unknown	Stock
CP 00914	NM	48	103.12199	32.43620	Robert Wallach	72	Unknown	Exploration
CP 00133	NM	48	103.12622	32.43438	Harien Stephens	Unknown	Unknown	Domestic
322609103073401	NM	48	103.12611	32.43583	Stephens, William O.	70	Unknown	Stock
322555103072801	NM	48	103.12444	32.43194	Lea County Concrete Co.	80	Unknown	Commercial
CP 00193	NM	49	103.10698	32.40539	George W. Sims	Unknown	Unknown	Domestic
CP 00190	NM	49	103.10698	32.40539	George W. Sims	Unknown	Unknown	Domestic
322435103063101	NM	49	103.10861	32.40972	Sims, George	56	Unknown	Domestic
322405103062702	NM	49	103.10750	32.40139	Sims, George	47	Unknown	Unused
322405103062701	NM	49	103.10750	32.40139	Sims, George	Unknown	Unknown	Domestic
322508103070701	NM	51	103.11861	32.41889	Sims, George	85	Unknown	Unused
CP 00220	NM	52	103.12408	32.44892	M. W. Owens	Unknown	Unknown	Domestic
CP 00356	NM	53	103.12301	32.42986	Will J. McCasland	Unknown	Unknown	Domestic
CP 00111	NM	53	103.12084	32.43164	W. J. McCasland	Unknown	Unknown	Domestic
322552103073001	NM	53	103.12500	32.43111	Eva Owen Estate	74	Unknown	Commercial
322551103072801	NM	53	103.12444	32.43083	Roberts, Grady	Unknown	Unknown	Domestic
322547103072601	NM	53	103.12389	32.42972	Braithwaite, E.G.	91	Unknown	Unused
322546103073001	NM	53	103.12500	32.42944	Bowman, Gail	90	Unknown	Domestic
322538103072701	NM	53	103.12417	32.42722	McCasland, W.J.	90	Unknown	Domestic
26-40-9B	TX	54	103.00654	32.39383	Ralph McWhorter	70	10/04/1978	Domestic
26-40-9A	TX	54	103.00654	32.39613	Ralph McWhorter	180	08/17/1978	Domestic
26-40-9A	TX	54	103.00692	32.39613	Ralph McWhorter	50	09/18/1978	Domestic
322427103065001	NM	55	103.11389	32.40750	Sims, George	59	Unknown	Unused
322425103065301	NM	55	103.11472	32.40694	Sims, George	59	Unknown	Unused
CP 00138	NM	56	103.12839	32.43986	Marion and William O. Stephens	Unknown	Unknown	Stock
322637103074101	NM	56	103.12806	32.44361	Warren, Gulf	Unknown	Unknown	Unused

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322635103072601	NM	56	103.12389	32.44306	Owen, M. W.	80	Unknown	Stock
322625103074801	NM	56	103.13000	32.44028	Warren, Gulf	85	Unknown	Unused
322601103074201	NM	57	103.12833	32.43361	Owens, J.M. & M.W.	Unknown	Unknown	Domestic
322550103074601	NM	58	103.12944	32.43056	Owens, J.M. & M.W.	70	Unknown	Stock
322541103073801	NM	58	103.12722	32.42806	Warren, Gulf	195	Unknown	Commercial
322535103073101	NM	58	103.12528	32.42639	Snyder, Keith	87	Unknown	Stock
322532103073601	NM	58	103.12667	32.42556	Warren, Gulf	Unknown	Unknown	Commercial
322532103072601	NM	58	103.12389	32.42556	McCasland, W.J.	90	Unknown	Domestic
322531103074501	NM	58	103.12917	32.42528	Warren, Gulf	85	Unknown	Commercial
CP 00070	NM	59	103.10058	32.49243	McVay Drilling Co.	72	9/10/1962	Stock
26-40-301	TX	60	103.01889	32.49583	Doug McWharter	Unknown	01/21/1990	Stock
26-40-3	TX	60	103.01555	32.49749	John Goen	163	05/16/1994	Irrigation
CP 00442	NM	61	103.07806	32.50423	Unknown	532	1/1/1967	Exploration
CP 00195	NM	63	103.12201	32.41084	George W. Sims	Unknown	Unknown	Domestic
322521103073601	NM	64	103.12667	32.42250	Humble Oil Co.	87	Unknown	Domestic
322510103073601	NM	64	103.12667	32.41944	Humble Oil Co.	85	Unknown	Unused
26-40-3	TX	65	103.00692	32.49466	John Goen	147	04/14/1994	Irrigation
322831103071901	NM	66	103.12194	32.47528	Stephens, Wm O.	Unknown	Unknown	Stock
27-33-4B	TX	67	102.98046	32.42099	Ralph McWhorter	201	09/14/1978	Domestic
322321103054101	NM	68	103.09472	32.38917	Simms, George	386	Unknown	Unused
322309103054401	NM	68	103.09556	32.38583	Unknown	Unknown	Unknown	N/A
323031103035002	NM	69	103.06389	32.50861	McNeil	Unknown	Unknown	Unused
323031103035001	NM	69	103.06389	32.50861	McNeil	Unknown	Unknown	Stock
CP 00221	NM	70	103.13360	32.43522	J.M. Owen	Unknown	Unknown	Domestic
CP 00214	NM	70	103.13050	32.43438	J. M. and M. W. Owen	Unknown	Unknown	Domestic
322604103075901	NM	70	103.13306	32.43444	Continental Oil Co.	75	Unknown	Commercial
322551103081401	NM	70	103.13722	32.43083	Owen, J.M.	290	Unknown	Domestic

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322551103075001	NM	70	103.13056	32.43083	Owens, J.M. & M.W.	300	Unknown	Unused
CP 00192	NM	71	103.08994	32.38186	George W. Sims	Unknown	Unknown	Domestic
322245103053301	NM	71	103.09250	32.37917	Texas Co.	Unknown	Unknown	Unused
322446103073601	NM	72	103.12667	32.41278	Humble Oil Co.	82	Unknown	Unused
CP 00137	NM	73	103.11770	32.48516	Marion and William O. Stephens	Unknown	Unknown	Stock
322909103070601	NM	73	103.11833	32.48583	Unknown	Unknown	Unknown	Stock
322901103071101	NM	73	103.11972	32.48361	Terry, McNeil	100	Unknown	Unused
322637103080901	NM	74	103.13583	32.44361	Warren, Gulf	101	Unknown	Irrigation
CP 00700	NM	75	103.12941	32.46792	Wayne R. Walker	75	9/10/1986	Domestic
CP 00562	NM	75	103.12837	32.47068	Jimmie D. Weir	136	12/23/1976	Stock
CP 00134	NM	75	103.12409	32.47068	Harlen Stephens	Unknown	Unknown	Stock
322815103075602	NM	75	103.13222	32.47083	Stephens, W.O.	Unknown	Unknown	Unused
322805103075601	NM	75	103.13222	32.46806	Skelly Plant #2	83	Unknown	Unused
322803103073901	NM	75	103.12750	32.46750	Dunn, D.S.	Unknown	Unknown	Domestic
322801103073101	NM	75	103.12528	32.46694	Osborn, Mrs. O.J.	85	Unknown	Domestic
322759103075601	NM	75	103.13222	32.46639	Skelly Oil Co.	89	Unknown	Other
322426103073601	NM	76	103.12667	32.40722	Marathon Oil Co.	Unknown	Unknown	Unused
27-33-4A	TX	77	102.97541	32.41899	Ralph McWhorter	176	08/08/1978	Domestic
322241103052801	NM	78	103.09111	32.37806	Sims, George	513	Unknown	Domestic
322227103051401	NM	78	103.08722	32.37417	Sims, Amanda	476	Unknown	Unused
322805103080101	NM	79	103.13361	32.46806	Unknown	82	Unknown	Unused
322805103075901	NM	79	103.13306	32.46806	Stephens, Wm O.	Unknown	Unknown	Irrigation
322803103080101	NM	79	103.13361	32.46750	Skelly Oil Co.	81	Unknown	Other
322734103082601	NM	80	103.14056	32.45944	Warren, Gulf	96	Unknown	Unused
322731103081701	NM	80	103.13806	32.45861	Warren, Gulf	Unknown	Unknown	Unused
322724103083201	NM	80	103.14222	32.45667	Graves, Dr. Sam W.	Unknown	Unknown	Unused
322724103081101	NM	80	103.13639	32.45667	Warren, Gulf	84	Unknown	Unused

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322717103082301	NM	80	103.13972	32.45472	Warren, Gulf	96	Unknown	Other
26-40-3	TX	81	103.01498	32.50827	John Goen	136	04/19/1994	Irrigation
322418103075601	NM	82	103.13222	32.40500	Deck, Millard	140	Unknown	Stock
322403103080301	NM	82	103.13417	32.40083	Mitchell, A.P.	Unknown	Unknown	Stock
CP 00581	NM	83	103.12625	32.39815	Northern Natural Gas Co.	125	Unknown	Industrial
CP 00581	NM	83	103.12625	32.39815	Northern Natural Gas Co.	125	4/18/1979	Industrial
CP 00555	NM	83	103.12732	32.39727	Northern Natural Gas Co.	497	Unknown	Industrial
CP 00199	NM	83	103.12625	32.39452	Leo Sims	Unknown	Unknown	Domestic
CP 00189	NM	83	103.12201	32.39634	George W. Sims	Unknown	Unknown	Domestic
CP 00189	NM	83	103.15404	32.43260	Paul D. Prather	145	2/25/1994	Stock
322342103073101	NM	83	103.12528	32.39500	Pierce, Ray A.	78	Unknown	Stock
322333103072301	NM	84	103.12306	32.39250	Sims, George	Unknown	Unknown	Stock
322322103072101	NM	84	103.12250	32.38944	Sims, George	80	Unknown	Unused
322751103083101	NM	85	103.14194	32.46417	Skelly Oil Co.	85	Unknown	Other
322849103080601	NM	86	103.13500	32.48028	Owens, J.M.	48	Unknown	Stock
26-40-3	TX	87	103.02015	32.51517	John Goen	105	04/06/1994	Irrigation
04/05/94	TX	87	103.01900	32.51709	John Goen	138	04/05/1994	Irrigation
323025103062801	NM	88	103.10778	32.50694	McNeill, Ray	90	Unknown	Stock
323025103062501	NM	88	103.10694	32.50694	Unknown	90	Unknown	Unused
323022103062301	NM	88	103.10639	32.50611	Fullerton Oil Co.	90	Unknown	Unused
322704103084901	NM	89	103.14694	32.45111	Warren, Gulf	99	Unknown	Unused
322657103084801	NM	89	103.14667	32.44917	Skelly Oil Co.	101	Unknown	Other
322652103084701	NM	89	103.14639	32.44778	Skelly Oil Co.	Unknown	Unknown	Unused
322652103084401	NM	89	103.14556	32.44778	Warren, Gulf	118	Unknown	Other
322648103084601	NM	89	103.14611	32.44667	Skelly Oil Co.	Unknown	Unknown	Other
CP 00881	NM	90	103.14550	32.45799	Richard Don Jones	95	9/7/1999	Domestic
322729103085201	NM	90	103.14778	32.45806	Skelly Oil Co.	106	Unknown	Unused

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322724103085102	NM	90	103.14750	32.45667	Skelly Oil Co.	103	Unknown	Unused
322724103085101	NM	90	103.14750	32.45667	Graves, Dr. Sam W.	94	Unknown	Unused
CP 00212	NM	91	103.13480	32.48516	J. M. Owens	Unknown	Unknown	Domestic
27-33-4A	TX	92	102.95876	32.45059	EMCO Machine Works	147	02/26/1981	Domestic
322324103073501	NM	93	103.12639	32.39000	Sims, Leo	Unknown	Unknown	Stock
322322103074001	NM	93	103.12778	32.38944	Sim, Leo	80	Unknown	Unused
323046103062202	NM	94	103.10611	32.51278	Unknown	Unknown	Unknown	N/A
323046103062201	NM	94	103.10611	32.51278	Unknown	900	Unknown	N/A
322444103084801	NM	95	103.14667	32.41222	Cities Service Oil Co.	Unknown	Unknown	Unused
322804103085701	NM	96	103.14917	32.46778	Eubanks, O.R.	80	Unknown	Commercial
322804103084801	NM	96	103.14667	32.46778	Eubanks, O.R.	100	Unknown	Commercial
322803103085701	NM	96	103.14917	32.46750	Eubanks, O.R.	Unknown	Unknown	Commercial
322159103060601	NM	97	103.10167	32.36639	Hansen, Ernest	300	Unknown	Domestic
CP 00706	NM	98	103.12414	32.37462	Ellie Spear	96	12/31/1986	Domestic
CP 00187	NM	98	103.12414	32.37825	George W. Sims	Unknown	Unknown	Domestic
322258103073001	NM	98	103.12500	32.38278	Boyd, Ollie I.	Unknown	Unknown	Unused
322243103072501	NM	98	103.12361	32.37861	Unknown	Unknown	Unknown	N/A
322237103073601	NM	98	103.12667	32.37694	Sims, Leo	80	Unknown	Unused
322230103072301	NM	98	103.12306	32.37500	Sims, George	75	Unknown	Unused
322424103085401	NM	99	103.14833	32.40667	Fristoe, L.W.	63	Unknown	Unused
322416103085401	NM	99	103.14833	32.40444	Fristoe, L.W.	Unknown	Unknown	Stock
322222103070201	NM	100	103.11722	32.37278	Sims, George	Unknown	Unknown	Domestic
CP 00736	NM	101	103.15723	32.45163	Ronald K. Woorden	120	9/10/1988	Domestic
CP 00346	NM	101	103.15828	32.45254	H.A. Bramlett	Unknown	Unknown	Domestic
322714103093101	NM	101	103.15861	32.45389	Graves, Dr. Sam W.	63	Unknown	Stock
322708103091801	NM	101	103.15500	32.45222	Jones, Ron	Unknown	Unknown	Unused
322706103093001	NM	101	103.15833	32.45167	Faulkner, T.P.	80	Unknown	Domestic

TABLE 3-1
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE WCS LANDFILL SITE
(BANKS SURVEY)

Well ID	State	Map Number	Longitude W	Latitude N	Owner	Total Depth (feet)	Date Completed	Proposed Use
322659103093001	NM	101	103.15833	32.44972	Faulkner, T.P.	90	Unknown	Domestic
322658103092601	NM	101	103.15722	32.44944	Bramlett, H.A.	90	Unknown	Domestic
CP 00197	NM	102	103.11985	32.51060	George W. Sims	Unknown	Unknown	Domestic
322932103082701	NM	103	103.14083	32.49222	Humble Oil Co.	Unknown	Unknown	Unused
322923103083201	NM	103	103.14222	32.48972	Humble Oil Co.	60	Unknown	Unused
322921103083001	NM	103	103.14167	32.48917	Humble Oil Co.	Unknown	Unknown	Unused
CP 00673	NM	104	103.14443	32.39727	Paul E. and Mary Hughes	Unknown	Unknown	Domestic
CP 00548	NM	105	103.15832	32.43986	A.J. Redden	Unknown	Unknown	Domestic
322641103093001	NM	105	103.15833	32.44472	McLean, R.L.	93	Unknown	Irrigation
322638103093001	NM	105	103.15833	32.44389	McLean, R.L.	100	Unknown	Irrigation
322633103093401	NM	105	103.15944	32.44250	Eunice Rental Tool Co.	103	Unknown	Commercial
322632103093401	NM	105	103.15944	32.44222	Eunice Rental Tool Co.	100	Unknown	Commercial
322810103092001	NM	106	103.15556	32.46944	Unknown	Unknown	Unknown	Stock

NOTE:
WATER WELL LOCATIONS PROVIDED BY BANKS INFORMATION SOLUTIONS, INC. IN REPORT DATED 16 NOVEMBER 2005. ADDITIONAL WATER WELLS A-E LOCATED IN FIELD BY CJI PERSONNEL USING GPS UNIT.

BASE MAP SOURCE:
TEXAS NATURAL RESOURCE INFORMATION SYSTEM (TNRIS) DIGITAL DATA
TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT)
ANDREWS COUNTY, TEXAS SPRING 2003

REV.	DATE	DESCRIPTION	DR BY	APP BY

COOK-JOYCE INC.
ENGINEERING AND CONSULTING
812 WEST ELEVENTH 512-474-9097
AUSTIN, TEXAS 78701
TEXAS REGISTERED ENGINEERING FIRM F-883

PROJECT:
WASTE CONTROL SPECIALISTS LLC
ANDREWS COUNTY, TEXAS

SHEET TITLE:
WATER WELLS WITHIN A 10-KILOMETER RADIUS OF THE LANDFILL SITE

DES BY	---		SCALE: SEE BAR SCALE
DR BY	SDB		PROJECT NO. 18059.01
CHK BY	GG		CJI NO. 18059006
APP BY	GG		SHEETS 1 OF 1 SHEETS
DATE ISSUED: 08-09-2019			FIGURE NO. 6-1
FILE: WCS_Fig6-1.dwg			

S:\CAD\WCS\18059\18059006 Fig 6-1.dwg, 8/9/2019 11:53:29 AM

Attachment ECO-1-1

Five-Year Report Concerned with Threatened and Endangered Species Occurring near the Land Disposal Facilities Pursuant to Radioactive Material License No. R04100; License Condition 160

July 11, 2014

THE TEXAS SOLUTION

July 11, 2014 **VIA Fed Ex**

Mr. Charles Maguire Director
Radioactive Materials Division, MC-233
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

References: (1) Radioactive Material License No. R04100, Amendment 25
CN600616890/RN101702439

Subject: **Five-Year Report Concerned with Threatened and Endangered Species Occurring near the Land Disposal Facilities Pursuant to Radioactive Material License No. R04100; License Condition 160**

Dear Mr. Maguire:

Amendment 25 of Radioactive Material License R04100 (RML R04100) License Condition 160 requires:

The Licensee must provide to the executive director every five (5) years written documentation from the Texas Parks and Wildlife Department and the United States Fish and Wildlife Service regarding the presence of threatened or endangered species occurring near the site of the land disposal facility.

This letter along with the attached enclosures fulfills the five-year requirement of this license condition.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Corporate
5430 LBJ Freeway, Ste. 1700
Three Lincoln Centre
Dallas, TX
972-715-9800
Fax. 972-448-1419

Facility
P.O. Box 1129
Andrews, TX 79714
888-789-2783
Fax. 432-525-8902

WCS requests that a copy of all correspondence regarding this matter be emailed directly to my attention at (jcartwright@wcstexas.com) as soon as possible after issuance. If you have any questions or need additional information, please call me at 432-525-8500.

Sincerely,

Jay Cartwright,
Radiation Safety Officer and Director of Radiation Safety

Enclosures

cc: Bobby Janecka, TCEQ
Elicia Sanchez, WCS
Scott Kirk, WCS
Jane Grimm, WCS
WCS Regulatory Compliance
WCS Records Management

ENCLOSURES

1.) Summary of Federal and State listings of Threatened and Endangered Species, Andrews County, Texas

2.) Texas Parks and Wildlife Department List of Threatened and Endangered Species, Andrews County Texas

3.) U. S. Department of Fish and Wildlife List of Threatened and Endangered Species,

ENCLOSURE 1

ANDREWS COUNTY, TX

Taxon	Common Name	Scientific Name	Federal Status	State Status
Birds	American Peregrine Falcon	*Falco peregrinus anatum*	DL	T
Birds	Peregrine Falcon	*Peregrinus anatum*	DL	T
Birds	Northern Aplomado Falcon	*Falco femoralis septentrionalis*	LE	
Birds	Bald Eagle	*Haliaeetus leucocephalus*	DL	T
Birds	Lesser Prairie Chicken	*Tympanuchus pallidicinctus*	LT	
Birds	Whooping Crane	*Grus americana*	LE	E
Birds	Least Tern	*Sterna antillarum*	LE	
Birds	Piping Plover	*Charadriusmelodous*	LT	
Mammals	Gray Wolf	*Canus lupus*	LE	E
Mammals	Black-footed Ferret	*Mustela nigripes*	LE	
Reptile	Texas Horned Lizard	*Phrynosoma cornutum*		T

Status Key	
DL, PDL -	Federally Delisted/Proposed for Delisting
LE, LT -	Federally Listed Endangered/Threatened
E, T -	State Listed Endangered/Threatened

American Peregrine Falcon and ***Peregrine Falcon***: Both are delisted at the Federal level and listed as threatened in the State of Texas. These falcons are year round residents and local breeders in west Texas, nesting in tall cliff eyries, landforms which are absent at the WCS facility. These birds occupy a wide range of habitats during migration including urban, lakeshore and coastal environments. They migrate across the state from more northern breeding areas in the US and Canada, and winters along the coast and farther south. The preferred habitat for these falcons does not exist at the WCS site. It is likely that they migrate through Andrews County as a transient population.

Northern Aplomado Falcon: This bird is listed as endangered at the federal level. This falcon frequents desert grasslands and coastal prairies of western Texas, most of New Mexico and southeastern Arizona, using the abandoned nests of other hawks or ravens for rearing young. A "non-essential" experimental population has been established in Arizona and New Mexico. Numerous captive reared Aplomado Falcons have been released in Texas. The U. S. Fish and Wildlife Service cite mesquite encroachment on grasslands as a negative habitat factor for this falcon, thus the preferred habitat for the falcon does not exist near the WCS operation. It is likely that the Northern Aplomado Falcon seeks out more favorable habitat.

Bald Eagle: The Bald Eagle is listed as threatened by the State of Texas but it has been delisted at the Federal level. The ideal habitat for this bird is nearby rivers and large lakes. The Bald Eagle nests in tall trees or on cliffs near water. These habitat types are non-existent for many miles surrounding the WCS facility. It is possible that Bald Eagles migrate through the west Texas/southeast New Mexico area but it is very un-likely that Bald Eagles would take up residence in the area.

Lesser Prairie Chicken: The Lesser Prairie Chicken is listed as threatened at the Federal level but is not listed at in the State of Texas. The ideal habitat for this bird is arid grasslands generally interspersed with shrubs, but dominated by grasses. Lesser Prairie Chickens nest in scrapes lined with grasses. As part of the permitting process, WCS performed an intensive study to determine if Lesser Prairie Chickens frequented company controlled property. No evidence of the existence of these birds on WCS controlled lands was found.

Whooping Crane: Whooping Cranes are listed as an endangered species at both the Federal and State level. This bird prefers marshy wetland habitats, nesting on raised mounds within the marsh. The WCS facility is located in an arid region and no ideal habitat for Whooping Cranes exists for many miles surrounding the facility. Andrews County appears to be on the extreme western edge of the migration path between breeding grounds in Canada and wintering grounds on the Texas gulf coast. It is possible that Whooping Cranes could migrate through Andrews County as a transient population.

Least Tern: Least Terns are listed as endangered at the Federal level but is not listed at the State level. These birds live along rivers, wetlands, ponds and lakes. The WCS

facility is located in an arid region and no ideal habitat for Least Terns exists for many miles surrounding the facility. Andrews County may be on the migration path of the Least Tern between breeding grounds to the north and wintering grounds in the Caribbean and South America. It is possible that Least Terns could migrate through Andrews County as a transient population.

Piping Plover: This bird is listed as threatened at the Federal level but is not listed at the State level. The Piping Plover inhabits wide, flat open sandy beaches and nest along small creeks or wetlands. In the summer, the birds inhabit the Northern Great Plains, the Great Lakes Region and the Atlantic Coast. In the winter, the birds migrate to the Gulf of Mexico and points farther south. The WCS facility is located in an arid region and no ideal habitat for Piping Plovers exists for many miles surrounding the facility. Andrews County may be on the migration path of the Piping Plover between breeding grounds to the north and wintering grounds in the Gulf of Mexico. It is possible that Least Terns could migrate through Andrews County as a transient population.

Gray Wolf: The Gray Wolf is listed as an endangered species at both the Federal and State level. These animals are wide ranging and currently exist as a recovering population in the forests and savannas of northern tier states (Great Lakes and Rocky Mountain regions) of the United States. The wolf is relatively abundant in Canada and Alaska. The Gray Wolf population has recovered in reintroduction areas to the point that the species is proposed for delisting in 2014. A subspecies, the Mexican Gray Wolf, will remain on the endangered list for some time into the future. Recovery efforts for the Mexican Gray Wolf are ongoing in Arizona and New Mexico. There are no known populations of Gray Wolves or the Mexican Gray Wolves in Andrews County, Texas.

Black-footed Ferret: Black-footed Ferrets are listed as an endangered species at the Federal level. The preferred habitat for these animals is large Prairie Dog towns on open grasslands. These ferrets typically reside in the abandoned burrows of Prairie Dogs or other burrowing animals. Populations of Black Footed Ferrets have been re-established in Arizona, Colorado, Montana, South Dakota, Utah and Wyoming from captive stocks. Recovery efforts continue and delisting of the animal may occur in ten years or so, provided the population continues to recover. There are no Prairie Dog towns known on the WCS property thus, no suitable habitat exists at the WCS facility for the Black-footed Ferret.

Texas Horned Lizard: Texas Horned Lizards are listed as threatened in the State of Texas. This lizard ranges from Colorado and Kansas to northern Mexico and from southeastern Arizona to Texas. Isolated, introduced populations exist in the Carolinas, Georgia and northern Florida. The Texas Horned Lizard may also be native to Arkansas and Louisiana. This reptile typically occupies bright sunny areas near Harvester Ant hills. These ants make up the majority of this lizard's diet. The decline of the Texas Horned Lizard has been attributed to the invasion of Fire Ants into Texas. Fire Ants eradicate Harvester Ant colonies, removing the lizard's primary food source.

The Texas Horned Lizard has declined over 30 percent of its range but is now reportedly recovering throughout its range.

ENCLOSURE 2

Last Revision: 4/28/2014 4:07:00 PM

ANDREWS COUNTY

BIRDS

		Federal Status	State Status
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T

year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Arctic Peregrine Falcon	*Falco peregrinus tundrius*	DL	

migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.

Baird's Sparrow *Ammodramus bairdii*

shortgrass prairie with scattered low bushes and matted vegetation; mostly migratory in western half of State, though winters in Mexico and just across Rio Grande into Texas from Brewster through Hudspeth counties

Bald Eagle	*Haliaeetus leucocephalus*	DL	T

found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds

Ferruginous Hawk *Buteo regalis*

open country, primarily prairies, plains, and badlands; nests in tall trees along streams or on steep slopes, cliff ledges, river-cut banks, hillsides, power line towers; year-round resident in northwestern high plains, wintering elsewhere throughout western 2/3 of Texas

Lesser Prairie-Chicken	*Tympanuchus pallidicinctus*		T

arid grasslands, generally interspersed with shrubs such as sand sagebrush, sand plum, skunkbush sumac, and shinnery oak shrubs, but dominated by sand dropseed, sideoats grama, sand bluestem, and little bluestem grasses; nests in a scrape lined with grasses

Mountain Plover *Charadrius montanus*

breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous

Peregrine Falcon	*Falco peregrinus*	DL	T

both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level; see subspecies for habitat.

Prairie Falcon *Falco mexicanus*

open, mountainous areas, plains and prairie; nests on cliffs

ANDREWS COUNTY

BIRDS

		Federal Status	State Status
Snowy Plover	*Charadrius alexandrinus*		

formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast

Sprague's Pipit	*Anthus spragueii*	C	

only in Texas during migration and winter, mid September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges.

Western Burrowing Owl *Athene cunicularia hypugaea*

open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows

Western Snowy Plover *Charadrius alexandrinus nivosus*

uncommon breeder in the Panhandle; potential migrant; winter along coast

Whooping Crane	*Grus americana*	LE	E

potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties

MAMMALS

		Federal Status	State Status
Black-footed ferret	*Mustela nigripes*	LE	

extirpated; inhabited prairie dog towns in the general area

Black-tailed prairie dog *Cynomys ludovicianus*

dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle; live in large family groups

Gray wolf	*Canis lupus*	LE	E

extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands

Jones' pocket gopher *Geomys knoxjonesi*

southwestern plains of Texas; deep sandy soils of aeolian origin; small isolated population vulnerable to land use changes

Pale Townsend's big-eared bat *Corynorhinus townsendii pallescens*

roosts in caves, abandoned mine tunnels, and occasionally old buildings; hibernates in groups during winter; in summer months, males and females separate into solitary roosts and maternity colonies, respectively; single offspring born May-June; opportunistic insectivore

Swift fox *Vulpes velox*

restricted to current and historic shortgrass prairie; western and northern portions of Panhandle

ANDREWS COUNTY

REPTILES

		Federal Status	State Status
Dune sagebrush lizard	*Sceloporus arenicolus*		

confined to active sand dunes near Monahans; dwarf shin-oak sandhills with sagebrush and yucca; opportunistic insectivore; 'sit and wait' predator; burrows in sand or plant litter to escape enemies

Texas horned lizard	*Phrynosoma cornutum*		T

open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September

PLANTS

		Federal Status	State Status
Dune umbrella-sedge	*Cyperus onerosus*		

moist to wet sand in swales and other depressions among active or partially stabilized sand dunes; flowering/fruiting late summer-fall

Notes for
County Lists of Texas' Special Species

The Texas Parks and Wildlife (TPWD) county lists **include:**

Vertebrates, Invertebrates, and Vascular Plants identified as being of conservation concern by TPWD within Texas. These special species lists are comprised of species, subspecies, and varieties that are federally listed; proposed to be federally listed; have federal candidate status; are state listed; or carry a global conservation status indicating a species is critically imperiled, very rare, vulnerable to extirpation, or uncommon.

The TPWD county lists **do not include:**

Natural Plant Communities such as Little Bluestem-Indiangrass Series (native prairie remnant), Water Oak-Willow Oak Series (bottomland hardwood community), Saltgrass-Cordgrass Series (salt or brackish marsh), Sphagnum-Beakrush Series (seepage bog).

Other Significant Features such as bird rookeries, migratory songbird fallout areas, comprehensive migratory bird information, bat roosts, bat caves, invertebrate caves, and prairie dog towns.

These lists are not all inclusive for all rare species distributions. The lists were compiled, developed, and are updated based on field guides, staff expertise, scientific publications, and the TPWD Texas Natural Diversity Database (TXNDD) (formerly the Biological and Conservation Data System) occurrence data. Historic ranges for some state extirpated species, full historic distributions for some extant species, accidentals and irregularly appearing species, and portions of migratory routes for particular species are not necessarily included. Species that appear on county lists do not all share the same probability of occurrence within a county. Some species are migrants or wintering residents only. Additionally, a few species may be historic or considered extirpated within a county.

TPWD includes the Federal listing status for your convenience and makes every attempt to keep the information current and correct. However, the US Fish and Wildlife Service (FWS) is the responsible authority for Federal listing status. The TPWD lists do not substitute for contact with the FWS and federally listed species county ranges may vary from the FWS county level species lists because of the inexact nature of range map development and use.

Status Key:

LE, LT -	Federally Listed Endangered/Threatened
PE, PT -	Federally Proposed Endangered/Threatened
SAE, SAT -	Federally Listed Endangered/Threatened by Similarity of Appearance
C -	Federal Candidate for Listing; formerly Category 1 Candidate
DL, PDL -	Federally Delisted/Proposed for Delisting
NL -	Not Federally Listed
E, T -	State Listed Endangered/Threatened
NT -	Not tracked or no longer tracked by the State
"blank" -	Rare, but with no regulatory listing status

This information is specifically for your assistance only; due to continuing data updates, **please do not redistribute the lists**, instead refer all requesters to the web site at: http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/ or to our office for the most current information available. For questions regarding county lists, please call (512) 389-4571.

Please use the following citation to credit the source for this county level information:

Texas Parks and Wildlife Department, Wildlife Division, Diversity and Habitat Assessment Programs. County Lists of Texas' Special Species. [county name(s) and revised date(s)].

ENCLOSURE 3

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Austin Ecological Services Field Office
10711 BURNET ROAD, SUITE 200
AUSTIN, TX 78758
PHONE: (512)490-0057 FAX: (512)490-0974
URL: www.fws.gov/southwest/es/AustinTexas/;
www.fws.gov/southwest/es/EndangeredSpecies/lists/

Consultation Tracking Number: 02ETAU00-2014-SLI-0239 July 10, 2014
Project Name: Permit Renewal at an Existing Facility

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project.

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that *may* occur within the county of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

Please note that new information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Also note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of federally listed as threatened or endangered species and to determine whether projects may affect these species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

While a Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment, the Federal Agency must notify the Service in writing of any such designation. The Federal agency shall also independently review and evaluate the scope and content of a biological assessment prepared by their designated non-Federal representative before that document is submitted to the Service.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by a federally funded, permitted or authorized activity, the agency is required to consult with the Service pursuant to 50 CFR 402. The following definitions are provided to assist you in reaching a determination:

- *No effect* – the proposed action will not affect federally listed species or critical habitat. A “no effect” determination does not require section 7 consultation and no coordination or contact with the Service is necessary. However, if the project changes or additional information on the distribution of listed or proposed species becomes available, the project should be reanalyzed for effects not previously considered.
- *May affect, but is not likely to adversely affect* – the project may affect listed species and/or critical habitat; however, the effects are expected to be discountable, insignificant, or completely beneficial. Certain avoidance and minimization measures may need to be implemented in order to reach this level of effect. The Federal agency or the designated non-Federal representative should consult with the Service to seek written concurrence that adverse effects are not likely. Be sure to include all of the information and documentation used to reach your decision with your request for concurrence. The Service must have this documentation before issuing a concurrence.
- *Is likely to adversely affect* – adverse effects to listed species may occur as a direct or indirect result of the proposed action. For this determination, the effect of the action is neither discountable nor insignificant. If the overall effect of the proposed action is beneficial to the listed species but the action is also likely to cause some adverse effects to individuals of that species, then the proposed action “is likely to adversely affect” the listed species. The analysis should consider all interrelated and interdependent actions. An “is likely to adversely affect” determination requires the Federal action agency to initiate formal section 7 consultation with our office.

Regardless of the determination, the Service recommends that the Federal agency maintain a complete record of the evaluation, including steps leading to the determination of effect, the qualified personnel conducting the evaluation, habitat conditions, site photographs, and any other related information. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:
http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

Migratory Birds

For projects that may affect migratory birds, the Migratory Bird Treaty Act (MBTA) implements various treaties and conventions for the protection of these species. Under the MBTA, taking, killing, or possessing migratory birds is unlawful. Migratory birds may nest in trees, brushy areas, or other areas of suitable habitat. The Service recommends activities requiring vegetation removal or disturbance avoid the peak nesting period of March through August to avoid destruction of individuals, nests, or eggs. If project activities must be conducted during this time, we recommend surveying for nests prior to conducting work. If a nest is found, and if possible, the Service recommends a buffer of vegetation remain around the nest until the young have fledged or the nest is abandoned.

For additional information concerning the MBTA and recommendations to reduce impacts to migratory birds please contact the U.S. Fish and Wildlife Service Migratory Birds Office, 500 Gold Ave. SW, Albuquerque, NM 87102. A list of migratory birds may be viewed at http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/mbtintro.html. Guidance for minimizing impacts to migratory birds for projects including communications towers can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html. Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Finally, please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html).

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Permit Renewal at an Existing Facility

Official Species List

Provided by:

Austin Ecological Services Field Office
10711 BURNET ROAD, SUITE 200
AUSTIN, TX 78758
(512) 490-0057
http://www.fws.gov/southwest/es/AustinTexas/
http://www.fws.gov/southwest/es/EndangeredSpecies/lists/

Consultation Tracking Number: 02ETAU00-2014-SLI-0239
Project Type: Landfill
Project Description: This is an existing facility. Requested List will become part of a 10 Year Permit Renewal for RCRA Permit. Need the information for a Site Selection Report that is a required part of TCEQ Application Part B Form. Location is north of State HWY 176 at the TX/NM State line in Andrews County, TX. Size of the facility is approx. 1338 acres.
Facility disposes waste for industry, states and the Federal govt.

United States Department of Interior
Fish and Wildlife Service

Project name: Permit Renewal at an Existing Facility

Project Counties: Andrews, TX

United States Department of Interior
Fish and Wildlife Service

Project name: Permit Renewal at an Existing Facility

Endangered Species Act Species List

There are a total of 5 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 3 of these species should be considered only under certain conditions. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	Status	Has Critical Habitat	Condition(s)
Least tern *(Sterna antillarum)* Population: interior pop.	Endangered		Wind Energy Projects
Lesser prairie-chicken *(Tympanuchus pallidicinctus)*	Threatened		
northern aplomado falcon *(Falco femoralis septentrionalis)* Population: Entire, except where listed as an experimental population	Endangered		
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened	Final designated	Wind Energy Projects
Red Knot *(Calidris canutus rufa)*	Proposed Threatened		Wind Energy Projects

United States Department of Interior
Fish and Wildlife Service

Project name: Permit Renewal at an Existing Facility

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Ref: Jay Cartwright Date: 11Jul14 SHIPPING: 22.71
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HANDLING: 0.00
DV: 0.00 TOTAL: 24.87

Svcs: PRIORITY OVERNIGHT
TRCK: 6045 1917 2613

ORIGIN ID:MAFA (575) 394-4300
BOBBY SMITH
WASTE CONTROL SPECIALISTS
9998 HWY 176 WEST

ANDREWS, TX 79714
UNITED STATES US

SHIP DATE: 11JUL14
ACTWGT: 0.8 LB
CAD: 0978529/CAFE2704

BILL SENDER

TO **MARIE BOREN**
TCEQ
12100 PARK 35 CIRCLE BUILDING F
MC-233
AUSTIN TX 78753
(512) 239-6476
DEPT: RAD SAFETY

REF: JAY CARTWRIGHT

51RCP/FMF/SF03

FedEx Express

J1311130523012G

TRK# 0201 **6045 1917 2613**

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PRIORITY OVERNIGHT

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78753
TX-US **AUS**

Part # 156148-434 RITZ 05/12

July 14,2014

Dear Customer:

The following is the proof-of-delivery for tracking number **604519172613.**

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	B.COOPER	**Delivery location:**	12100 PARK 35 CIRCLE Austin, TX 78753
Service type:	FedEx Priority Overnight	**Delivery date:**	Jul 14, 2014 08:42
Special Handling:	Deliver Weekday		

Shipping Information:

Tracking number:	604519172613	**Ship date:**	Jul 11, 2014
		Weight:	1.0 lbs/0.5 kg

Recipient:
Marie Boren
TCEQ
12100 Park 35 Circle Building F
MC-233
Austin, TX 78753 US
Reference
Department number

Shipper:
Bobby Smith
Waste Control Specialists
9998 hwy 176 west
Andrews, TX 79714 US

Jay Cartwright
Rad Safety

Thank you for choosing FedEx.

Patricia Greene

From: Patricia Greene
Sent: Friday, July 11, 2014 10:56 AM
To: Charles Maquire (charles.maguire@tceq.texas.gov); (Bobby.Janecka@tceq.texas.gov); Elicia Sanchez; Scott Kirk Valhi; Jane Grimm Valhi; REGCOMPLIANCE
Cc: Jay Cartwright; Sheila Parker; Richard Wyckoff; John Farrell
Subject: 07-11-2014 Five Year Report Concerned with Threatened and Endangered Species Occuring Near the Land Disposal Facilities
Attachments: 07-11-2014 Five-Year Report Concerned with Threatened and Endangered Species.pdf

For your file.

Patricia L. Greene
Compliance Administration Supervisor
Waste Control Specialists LLC
P.O. Box 1129
Andrews, Texas 79714
Phone: (432) 525-8605
Fax: (432 525-8902

Patricia Greene

From: Charles Maguire [charles.maguire@tceq.texas.gov]
Sent: Friday, July 11, 2014 11:08 AM
To: Patricia Greene; Bobby Janecka; Elicia Sanchez; Scott Kirk Valhi; Jane Grimm Valhi; REGCOMPLIANCE
Cc: Jay Cartwright; Sheila Parker; Richard Wyckoff; John Farrell
Subject: RE: 07-11-2014 Five Year Report Concerned with Threatened and Endangered Species Occuring Near the Land Disposal Facilities

Received

From: Patricia Greene [mailto:pgreene@wcstexas.com]
Sent: Friday, July 11, 2014 10:56 AM
To: Charles Maguire; Bobby Janecka; Elicia Sanchez; Scott Kirk Valhi; Jane Grimm Valhi; REGCOMPLIANCE
Cc: Jay Cartwright; Sheila Parker; Richard Wyckoff; John Farrell
Subject: 07-11-2014 Five Year Report Concerned with Threatened and Endangered Species Occuring Near the Land Disposal Facilities

For your file.

Patricia L. Greene
Compliance Administration Supervisor
Waste Control Specialists LLC
P.O. Box 1129
Andrews, Texas 79714
Phone: (432) 525-8605
Fax: (432 525-8902