Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility: **Camino Real Landfill**
2	Name of company: **Camino Real Environmental Center, Inc.**
3	Current Permit number: **No NSR Permit Number, Title V Permit No. P186L-R3**
4	Name of applicant's modeler: **John Henkelman, SCS Engineers**
5	Phone number of modeler: (**916) 503-2955**
6	E-mail of modeler: **jhenkelman@scsengineers.com**

16-B: Brief

1	Why is the modeling being done? Other (describe below) **Modeling done because this is a new NSR minor source permit applications.**		
2	Describe the permit changes relevant to the modeling. **This is new modeling.**		
3	What geodetic datum was used in the modeling? **WGS84**		
4	How long will the facility be at this location? **Permanent**		
5	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	~~**Yes**~~	**No**
6	Identify the Air Quality Control Region (AQCR) in which the facility is located. **153**		
7	List the PSD baseline dates for this region (minor or major, as appropriate). **NA (non-PSD)**		
8	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits). **None within 50 km**		

9	Is the facility located in a non-attainment area? If so, describe. **Sunland Park Ozone Maintenance Area**
10	Describe any special modeling requirements, such as streamline permit requirements. **None**

16-C: Modeling History of Facility

1 Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

The facility was modeled in 2011 for its Title V Permit Renewal. Using the methods and standards at that time, the site demonstrated compliance with air quality standards. However, modeling standards now require inclusion of background concentrations for PM, and the facility cannot demonstrate compliance with current requirements and modeling must be performed to current standards. NMED has added modeling requirements for H2S to since the original modeling. This modeling is is not derived from the previous modeling.

This modeling is for the new NSR permit application and Title V Significant application.

	Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
	CO	P186L-R2	April 2011	
	NO_2	P186L-R2	April 2011	
	SO_2	P186L-R2	April 2011	
	H_2S	None		No standard for H2S at time of modeling
	PM2.5	P186L-R2	April 2011	
	PM10	P186L-R2	April 2011	
	TSP	P186L-R2	April 2011	
	Lead	None		Not a source of lead
	Ozone (PSD only)	None		Not a PSD source (modeling not required)
	NM Toxic Air Pollutants (20.2.72.402 NMAC)	None		No modeling required for toxics

16-D: Modeling performed for this application

1 For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

	Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
	CO	X				
	NO_2	X				
	SO_2	X				
	H_2S	X				
	PM2.5		X			
	PM10		X			
	Lead					X
	Ozone					X
	State air toxic(s) (20.2.72.402					X

	NMAC)					

16-E: New Mexico toxic air pollutants modeling

1	List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application. No toxics included in this modeling. Toxic emissions do not exceed limits in Tables A and B 20.2.72.502.

List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

	Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor

16-F: Modeling options

1	What model(s) were used for the modeling? Why? **AERMOD v16216R; Current approved EPA model.**
2	What model options were used and why were they considered appropriate to the application? **Regulatory default; PM modeling included dry plume depletion**

16-G: Surrounding source modeling

1	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the unmerged list of sources to describe the changes. **All surrounding sources provided by NMED were included in the modeling except sources representing the Camino Real landfill.**
2	Date of surrounding source retrieval. **7/10/17**

	AQB Source ID	Description of Corrections

16-H: Building and structure downwash

1	How many buildings are present at the facility?	**NA (no point sources)**	
2	How many above ground storage tanks are present at the facility?	0	
3	Was building downwash modeled for all buildings?	Yes	No
4	If not, explain why. **NA (no point sources)**		
5	Building comments		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area. **CRLF is surrounded by at least a 3-strand barbed wire fence with access is controlled by a locking gate and other physical barriers. The southern boundary of the landfill is delineated by the USA/Mexico border fence, and is patrolled 24-hours per day, 365-days per year by US Border Patrol Personnel.**		
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	~~Yes~~	**No**
3	Are restricted area boundary coordinates included in the modeling files?	**Yes**	~~No~~
4	Describe the receptor grids and their spacing. **Multi-tier Uniform Cartesian receptor grid - 250 m spacing to 3 km from source, 1000 meter spacing to 10 km f**rom source. The grid was reduced in PM molding runs to determine cumulative impact.		
5	Describe receptor spacing along the fence line. **50 meter receptor spacing 10 meters outside fenceline.**		
6	Describe the PSD Class I area receptors. **None**		

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? This information is optional (and purposely undefined), but may help determine issues related to public notice.	**Yes**	~~No~~
2	If so, describe. **Desert View and Sunland Park Elementary Schools are northeast of the landfill.**		
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	**Yes**	~~No~~

16-K: Modeling Scenarios

1	Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3). **All sources modeled as regular sources with no SSM scenarios. Only one scenario was modeled.**		
2	Which scenario produces the highest concentrations? Why? **One scenario modeled.**		
3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes	~~No~~

4	If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.) Sources: **Earthmoving equipment and haul roads (operational only during landfill operating hours)**											
5	Hour of Day (Mon-Sat)	Factor	Hour of Day (Mon-Sat)	Factor	Hour of Day (Sun)	Factor	Hour of Day (Sun)	Factor				
	1	0	13	1	1	0	13	0				
	2	0	14	1	2	0	14	0				
	3	0	15	1	3	0	15	0				
	4	0	16	1	4	0	16	0				
	5	0	17	1	5	0	17	0				
	6	1	18	0	6	0	18	0				
	7	1	19	0	7	0	19	0				
	8	1	20	0	8	0	20	0				
	9	1	21	0	9	0	21	0				
	10	1	22	0	10	0	22	0				
	11	1	23	0	11	0	23	0				
	12	1	24	0	12	0	24	0				
	If hourly, variable emission rates were used that were not described above, describe them here:											
6	Were different emission rates used for short-term and annual modeling?			~~Yes~~			**No**					
7	If yes, describe.											

16-L: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply. **No NOx-specific modeling options invoked.** **High eighth high used for 1-hr NO2 concentration**	
	X	100% NO_X to NO_2 conversion
		ARM
		PVMRM
		OLM
		ARM2
		Other:
2	Describe the NO_2 modeling. **Maximum impact/ROI modeling for an open flare**	
3	In-stack NO_2/NO_X ratio(s) used in modeling. **No NOx-specific modeling options invoked.**	
4	Equilibrium NO_2/NO_X ratio(s) used in modeling. **No NOx-specific modeling options invoked.**	
5	Describe/justify the use of the ratios chosen. **No NOx-specific modeling options invoked.**	
6	Describe the design value used for each averaging period modeled. 1-hour: **High first high** **High first high used as a conservative approach.**	

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	X	PM2.5
	X	PM10
	TSP standard removed	TSP
		None

2 Describe the particle size distributions used.
Include the source of information.
PM10:

2.5 um	**5%**
10 um	**15%**

PM2.5:

2.5 um	**100%**

Fractions obtained from NMED guidance for haul roads.

3	Was secondary PM modeled for PM2.5? Only required for PSD major modifications that are significant for NOx and/or SOx. Optional for minor sources, but allows use of high eighth high.	~~Yes~~	**No**

16-N: Setback Distances and Source Classification

1 Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.

No portable sources included in the modeling. The PM emissions from haul roads and the earthmoving operations are from stationary sources. Multiple locations for earthmoving operations are included in the modeling evaluation (ERTHMOVE, EARTHSOUTH, and EARTHEAST sources).

2 Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source.
A typical haul road location is used in the modeling.

3	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match?	~~Yes~~	No

4 Provide a cross-reference table between unit numbers if they do not match. It's ok to place the table below section 16-N for easier formatting.

Emission Source	Unit	Source ID
Road Particulate Emissions	001	L00000##
Landfill Earthmoving Particulate Emissions	002	ERTHMOVE, EARTHSOUTH, EARTHEAST (3 scenarios)
Landfill Gas Emissions	003	Landfill
Landfill Gas Flare	005	Flare

5	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match?	Yes	~~No~~
6	If not, explain why.		

7	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	~~Yes~~	No
8	Which units consume increment for which pollutants? Earthmoving, Haul Roads – PM10 Flare – PM10 and NOx		
9	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date). Earthmoving and haul road emissions sources existed in 2000, the PM10 baseline date. Emission rates in 2000 are derived from modeling files provided by NMED. The flare was not included in the modeling files. Documentation indicates it was installed two months prior to the PSD baseline. However, it was included in the modeling as a conservative approach and its relatively small contribution to modeled PM10 impacts.		
10	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. The flare was installed May 2000. The roadways existed in 2000. Emission calculations for 2000 are derived from modeling files from 2000 provided by NMED.	~~Yes~~ See text	~~No~~ See text
11	If not please explain how increment consumption status is determined for the missing installation dates.		

16-O: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	Flare	**30**	**4748660**	**1.87**

16-P: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? **NA – No guidelines provided for landfills or earthmoving dust as a volume source**	Yes	No
2	If the dimensions of volume sources are different from standard dimensions in the AQB Modeling Guidelines, describe how the dimensions were determined. **NA-no guidance provided**		
3	Describe the determination of sigma-Y and sigma-Z for fugitive sources. **Landfill emissions:** **Sigma-Z=2 meters to provide initial volume with a reasonable initial vertical mixing** **Sigma-Y=initial width/4.3 = 300m/2.15** **Earthmoving emissions:** **Sigma-Z=initial height/2.15 = 4m/2.15** **Sigma-Y=initial width/4.3 = 190m/4.3**		

4	Describe how the volume sources are related to unit numbers. Or say they are the same. **Earthmoving equipment – unit number 2 – Model ID ERTHMOVE, EARTHSOUTH, EARTHEAST** **ERTHMOVE represents the approximate current location of fill/earthmoving activities. EARTHSOUTH and EARTHEAST represent future earthmoving locations in Cell 3 (EARTHSOUTH) and the Cell 4 (EARTHEAST).** **Landfill – unit number 2 – Model ID LANDFILL**
5	Describe any open pits. **None**
6	Describe emission units included in each open pit. **None**

16-Q: Background Concentrations

1	Identify and justify the background concentrations used. **Raw hourly background PM10 concentrations were provided by NMED. SCS processed the concentrations and submitted them for review with the modeling plan. PM2.5 background concentrations were obtained from the NMED modeling guidance.**		
2	Were background concentrations refined to monthly or hourly values? **Hourly PM10 background concentrations were used in modeling.**	**Yes**	~~No~~

16-R: Meteorological Data

1	Identify and justify the meteorological data set(s) used. **Desert View 2016 – closest available met station on NMED website, most recent complete year selected to reflect current background PM10 concentrations.**
2	Discuss how missing data were handled, how stability class was determined, and how the data were processed, if the Bureau did not provide the data. **Data provided by NMED.**

16-S: Terrain

1	Was complex terrain used in the modeling? If no, describe why. **Yes**
2	What was the source of the terrain data? **USGS NED**

16-T: Modeling Files

Describe the modeling files: **A description of all files is provided in the table below. The files are included at (**https://www.dropbox.com/sh/lvadtbjiwvs5uin/AADUWnhCMcXh0idCMOUYzdOea?dl=0**).**

	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
1	**Camino Real PM10 ROI**	**PM10**	**ROI determination**
	Camino Real PM10 Cumulative	**PM10**	**Cumulative impacts**
	Camino Real PM2.5 ROI	**PM2.5**	**ROI determination**
	Camino Real PM2.5 Cumulative	**PM2.5**	**Cumulative impacts**
	Camino Real 1-hr NOx	**NOx (1-hr)**	**ROI determination**

	Camino Real Non-PM	SOx, CO, H2S, NOx (all other periods)	ROI Determination

16-U: PSD New or Major Modification Applications (NOT APPLICABLE)

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)? Not a new PSD source or major modification.	Yes	No
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes	No
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed?		

16-V: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant.
2	Identify the maximum concentrations from the modeling analysis.

Pollutant	Period	Facility Concentration (µg/m3)	Total Modeled Concentration (µg/m3)	Total Modeled Concentration (PPM)	Background Concentration	Cumulative Concentration	Standard	Value of Standard	Units of Standard, Background, and Total	Percent of Standard
H2S	hourly		9.74		0	9.74	13.9	NMAAQS	ug/m3	70%
CO	8-hour		23.0		NA	NA	500	SIL	ug/m3	4.6%
CO	1-hour		95.7		NA	NA	2,000	SIL	ug/m3	4.8%
NOx	Annual		0.283		NA	NA	1	SIL	ug/m3	28%
NOx	24-hour		1.63		NA	NA	5	SIL	ug/m3	33%
NOx	1-hour		21.0		80.86	101.86	188.03	NAAQS	ug/m3	54%
NOx	Annual		0.283		NA	NA	2.5	PSD Increment	ug/m3	11%
SOx	Annual		0.055		NA	NA	1	SIL	ug/m3	5.5%
SOx	24-hour		0.370		NA	NA	5	SIL	ug/m3	7.4%
SOx	3-hour		2.28		NA	NA	25	SIL	ug/m3	9.1%
SOx	1-hour		4.76		NA	NA	7.8	SIL	ug/m3	61%
PM10	Annual		7.94		NA	7.94	17	PSD Increment	ug/m3	48%

PM10	24-hour		137		Hourly	137	150	NAAQS	ug/m3	91%
PM2.5	Annual		10.9		Modeled	10.9	12	NAAQS	ug/m3	91%
PM2.5	24-hour		19.4		Modeled	19.4	35	NAAQS	ug/m3	55%

16-W: Location of maximum concentrations

1 Identify the locations of the maximum concentrations.

Pollutant	Period	UTM East (m)	UTM North (m)	Elevation (ft)	Distance (m)	Radius of Impact (ROI) (m)
H2S	hourly	3518951	348535	3980	Fenceline	5350
CO	8-hour	3517586	349684	4127	Fenceline	0
CO	1-hour	3517598	351800	4133	Fenceline	0
NOx	Annual	3518145	350191	4090	Fenceline	0
NOx	24-hour	3517584	349784	4086	Fenceline	0
NOx	1-hour	3517598	351800	4133	Fenceline	1580
SOx	Annual	3518145	350191	4090	Fenceline	0
SOx	24-hour	3517586	349684	4127	Fenceline	0
SOx	3-hour	3517586	349684	4128	Fenceline	0
SOx	1-hour	3517598	351800	4133	Fenceline	0
PM10	Annual	3517929	348518	4086	Fenceline	780
PM10	24-hour	3517584	349784	4086	Fenceline	1800
PM2.5	Annual	3517978	348518	4133	Fenceline	400
PM2.5	24-hour	3517601	348687	4129	Fenceline	1750

16-X: Summary/conclusions

1 A statement that modeling requirements have been satisfied and that the permit can be issued.

Modeling demonstrates that the facility will not contribute significantly to an exceedance of the NAAQS or NMAAQS outside the facility boundary. Modeling requirements have been met and the permit can be issued.