

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) 361-1297
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).			
	<p>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 not derived from the previous modeling.</p> <p>This modeling is for the new NSR permit application and Title V Significant application.</p>			
	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 ₂ S	None		No standard for H ₂ S at time of modeling
	PM _{2.5}	P186L-R2	April 2011	
	PM ₁₀	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 ₂ S	X				
	PM _{2.5}		X			
	PM ₁₀		X			
	TSP		X			
	Lead					X
	Ozone					X

	State air toxic(s) (20.2.72.402 NMAC)						X
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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	<p>“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.</p> <p>Describe the fence or other physical barrier at the facility that defines the restricted area.</p> <p>CRLF access is restricted by barbed-wire fence and physical barriers (steep hillsides, sand dunes, and elevated railroad tracks), and access is controlled by a locking gate. The southern boundary of the landfill is delineated by the USA/Mexico border fence, a 15-foot high fence that is patrolled 24-hours per day, 365-days per year by US Border Patrol Personnel.</p>		
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 from source. The grid was reduced in PM modeling runs to determine cumulative impact.		
5	Describe receptor spacing along the fence line. 50 meter receptor spacing 10 meters outside fence line.		
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	Yes	No

	for calculating the maximum emission rate.)											
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: NO₂ Modeling

1	Which types of NO ₂ modeling were used? Check all that apply. No NO_x-specific modeling options invoked. High eighth high used for 1-hr NO₂ concentration	
	<input checked="" type="checkbox"/>	100% NO _x to NO ₂ conversion
	<input type="checkbox"/>	ARM
	<input type="checkbox"/>	PVMRM
	<input type="checkbox"/>	OLM
	<input type="checkbox"/>	ARM2
	<input type="checkbox"/>	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 NO_x-specific modeling options invoked.	
4	Equilibrium NO ₂ /NO _x ratio(s) used in modeling. No NO_x-specific modeling options invoked.	
5	Describe/justify the use of the ratios chosen. No NO_x-specific modeling options invoked.	

6	Describe the design value used for each averaging period modeled. 1-hour: High eighth 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 (PM10 compliance with air quality standards was demonstrated by TSP modeling and PM10 was not run individually)	
	X	TSP	
	None		
2	Describe the particle size distributions used. Include the source of information. TSP:		
	2.5 um	5%	
	10 um	15%	
	15 um	5%	
	30 um	75%	
	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. No setbacks considered in modeling. The PM emissions from haul roads and the earthmoving operations are from stationary sources. This section is not applicable.		
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation 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.		
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?		
9	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).		

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.	Yes	No
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/4.3 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 EARTHMOVE 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

1	Describe the modeling files: A description of all files is provided in the table below. The files are included on a CD attached at the end of this UA-4 Form.		
	File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
	Camino Real TSP ROI	TSP, PM10 (as TSP)	ROI determination
	Camino Real TSP Cumulative	TSP, PM10 (as TSP)	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/m ³)	Total Modeled Concentration (µg/m ³)	Total Modeled Concentration (PPM)	Background Concentration	Cumulative Concentration	Standard	Value of Standard	Units of Standard, Background, and Total	Percent of Standard
H2S	hourly		10.1		0	10.1	13.9	NMAAQS	ug/m3	73%
CO	8-hour		23.3		NA	NA	500	SIL	ug/m3	4.6%
CO	1-hour		62.5		NA	NA	2,000	SIL	ug/m3	3%
NOx	Annual		0.332		NA	NA	1	SIL	ug/m3	33%
NOx	24-hour		2.77		NA	NA	5	SIL	ug/m3	55%
NOx	1-hour		21.7		80.86	102.56	188.03	NAAQS	ug/m3	55%
SOx	Annual		0.075		NA	NA	1	SIL	ug/m3	8%
SOx	24-hour		0.629		NA	NA	5	SIL	ug/m3	13%
SOx	3-hour		2.29		NA	NA	25	SIL	ug/m3	9%
SOx	1-hour		4.93		NA	NA	7.8	SIL	ug/m3	63%
TSP	Annual		39.4		Hourly	39.4	60	NMAAQS	ug/m3	66%
TSP	24-hour		114		Hourly	114	150	NMAAQS	ug/m3	76%
PM10	24-hour		39.4		Hourly	39.4	150	NAAQS	ug/m3	76%
PM2.5	Annual		1.62		9.53	11.15	12	NAAQS	ug/m3	93%
PM2.5	24-hour		12.1		20.6	32.7	35	NAAQS	ug/m3	93%

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	348953	3518716	3983	Fenceline	5350
CO	8-hour	349710	3517697	4120	Fenceline	0
CO	1-hour	349710	3517697	4120	Fenceline	0
NOx	Annual	350092	3518135	4127	145	0
NOx	24-hour	350092	3518135	4127	145	0
NOx	1-hour	349710	3517697	4120	Fenceline	1580
SOx	Annual	350092	3518135	4127	145	0
SOx	24-hour	350092	3518135	4127	145	0
SOx	3-hour	349696	3517704	4114	Fenceline	0
SOx	1-hour	349710	3517697	4120	Fenceline	0

TSP	Annual	348770	3518433	4035	Fenceline	780
TSP	24-hour	348772	3517584	4098	Fenceline	1800
PM10	24-hour	348772	3517584	4098	Fenceline	1800
PM2.5	Annual	348770	3518433	4035	Fenceline	400
PM2.5	24-hour	348342	3519636	4058	Fenceline	1,750

16-X: Summary/conclusions

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