

APPENDIX 4.1-16

LEA Technical Appendices Errata

Appendix 4.1-16

LEA Technical Appendices Errata

Comments received on the Draft EIR were made on the Proposed Project; however, because the analysis in several of the Land Exchange Alternative (LEA) technical reports (Draft EIR, Appendices 4.1-1 through 4.1-15) were similar to the analysis for the Proposed Project, similar revisions would be required to the Land Exchange Alternative Technical Reports. The following Errata summarizes those changes.

Errata Summary of Planning Document Text Changes Land Exchange EIR Alternative

Section (Page)	Change	Reason for Change
<i>Specific Plan - Appendix 4.1-1A</i>		
Page 164	Table 11: MF Zoning Box – revise building type from “E” to “K”	Correction
Page 172	Table 15: VC – Mixed Use Zoning Box – revise building type from “C” to “K”	Correction
Page 173	Table 16: Residential Zoning – revise building type from “C” to “K”	Correction
Pages 195-203	Revise Tentative Map Waivers	Correction
<i>Preserve Edge Plan - Appendix 4.1-1B</i>		
Attachment A	Delete “Rhus lentii – Pink Flowering Sumac” in Response to EIR Comment O-6.1-32	Correction
Attachment A	Revise Note 2 regarding plant species on Approved Plant List in Response to EIR Comment O-6.1-30	Correction
<i>Fire Protection Plan – Appendix 4.1-1C</i>		
Section 3	Revised description of Ignition Sources	Response to Comment
Appendix H	Updated list of suggested plans	Response to Comment
<i>Energy Conservation Plan – Appendix 4.1-1D</i>		
5.1 (pg. 14 – 15)	Revised the Zero Net Energy Residences, Energy Star Appliances features, and added four additional project design features (PDFAQ/GHG-7, -8, -9, and 10).	Response to Comments
5.2.1 (pg. 15)	Revised the description of EV Charging Stations to require a dedicated 208/240 dedicated branch circuit in each garage of residential units.	Response to Comments
5.2.2.10 (pg. 17)	Added requirement for a TDM Program transportation coordinator	Response to Comments
5.3.1.5 (pg. 18)	Added PDF-UT-5 limiting water use for cleaning outdoor surfaces and vehicles.	Response to Comments
6 (Table 1)	Updated to include new project design features (PDF-AQ/GHG-7, -8, -9, -10 and PDF-UT-5)	Response to Comments
<i>Public Facilities Finance Report - Appendix 4.1-1E</i>		
Page 106	Correct information regarding existing and planned school facilities within the Chula Vista Elementary School District	Correction
Page 106	Clarify “Transfer of Territory” language and existing capacity within school districts serving the Land Exchange EIR Alternative	Correction
<i>Village Design Plan - Appendix 4.1-1F</i>		
Page 24	Revise “Fire” to “Fuel” Modification Zone	Correction
Page 51	Delete “Rhus lentii – Pink Flowering Sumac” in Response to EIR Comment O-6.1-32	Correction
Attachment A	Delete “Rhus lentii – Pink Flowering Sumac” in Response to EIR Comment O-6.1.32	Correction

Appendix 4.1-16 (Continued)

Errata Summary of Planning Document Text Changes Land Exchange EIR Alternative

Section (Page)	Change	Reason for Change
Attachment A	Revise Note 2 regarding plant species on Approved Plant List in Response to EIR Comment O-6.1-30	Correction
<i>General Plan Amendment Report - Appendix 4.1-1J</i>		
Page 19	Correct reference to County GPA "2007 (GPA 06-12)"	Correction
Page 31	Existing Zoning – add reference to A72 (General Agriculture)	Correction
Page 86	Add "scenic" to LU-6.6	Correction

Summary of Appendix 4.1-3 LEA Air Quality Technical Report Text Changes

Section (Page)	Change	Reason for Change
1.2.5 (19)	The following PDFs were added: PDF-AQ/GHG-6 Efficient Outdoor lighting, PDF-AQ/GHG-7 Energy Efficiency Education, PDF-AQ/GHG-8 Cool Roads, and PDF-AQ/GHG-9 Cool Pavements	Response to comment
1.2.5 (20)	PDF-AQ/GHG-6 was changed to PDF-AQ/GHG-10 and revised to included dedicated 208/240 dedicated branch circuit in each garage.	New PDFs AQ/GHG-6, 7, 8 and 9 were added as a response to comment
3.3.4 (81)	The following PDFs were added: PDF-AQ/GHG-6 Efficient Outdoor lighting, PDF-AQ/GHG-7 Energy Efficiency Education, PDF-AQ/GHG-8 Cool Roads, and PDF-AQ/GHG-9 Cool Pavements, and PDF AQ/GHG6 was revised to PDF AQ/GHG-10	Response to comment
5.1 (129)	The following PDFs were added: PDF-AQ/GHG-6 Efficient Outdoor lighting, PDF-AQ/GHG-7 Energy Efficiency Education, PDF-AQ/GHG-8 Cool Roads, and PDF-AQ/GHG-9 Cool Pavements	Response to comment

Summary of Appendix 4.1-4 Otay Ranch Village 14 and Planning Areas 16 & 19 LEA Biological Resources Technical Report Text Changes

Section (Page)	Change	Reason for Change
Sections 1.2	Clarification regarding ownership of the "Inverted L".	Response to Comment
Sections 1.2, 5, 5.4, 10.2.5.2, and 10.2.6	Update to reference more recent date of reference (RH Consulting Group et al. 2018).	Update
Section 2	Update regarding federal, state, and local regulations	Update
Section 2.4.1	Updated description of MSCP Cornerstone Lands regarding the potential for a Boundary Adjustment as part of the Site Development Permit Process	Response to Comment
Section 2.3.5	Update regarding the Otay Ranch RMP goals, objectives, and policies that apply to project	Update
Section 3.1	Added reference to literature review	Clarification
Section 3.1	Added additional review of wildlife corridor and crossing studies	Clarification and Additional Information
Section 3.3.1	Clarifications regarding reference population review	Response to comment

Appendix 4.1-16 (Continued)

Summary of Appendix 4.1-4 Otay Ranch Village 14 and Planning Areas 16 & 19 LEA Biological Resources Technical Report Text Changes

Section (Page)	Change	Reason for Change
Section 3.3.2	Updated text (removed) regarding Quino Checkerspot Butterfly Host Plant Mapping	Update
Section 3.3.8	Clarified the resources used during the habitat assessment	Clarification
Section 3.4	Clarifications regarding Survey Limitations	Clarification
Section 4.2	Clarifications regarding List of California Vegetation Alliances and Associations (removed text)	Clarification
Section 4.4	Clarification regarding Fauna and numbers of wildlife species	Clarification
Section 4.4.1	Added Footnote	Response to comment
Section 4.4.3	Clarification on bat information	Clarification
Section 4.5.1	Update regarding Munz's Sage	Clarification
Section 4.6.1	Updated description of Western Spadefoot	Response to Comments
Section 4.6.1	Clarified information regarding MSCP	Clarification
Section 4.6.1	Clarified definition of vernal pool	Clarification
Section 4.6.1	Clarification on information regarding protocol surveys	Clarification
Section 4.6.1	Clarification on information regarding Quino Checkerspot Butterfly	Clarification
Table 5-4 and Table 6-2	Changed to correct the spelling of western dichondra	Correction
Section 4.6.2	Corrected description of Monarch butterfly	Correction
Section 4.8	Update text with information on Appendix L	Update
Section 5.3.1.2 and Section 6.2.2.2	Clarified impact W-2 to include reference to breeding and nesting	Clarification
Section 5.3.1.2	Clarified survey years for Quino checkerspot butterfly	Clarification
Section 5.3.2.2 and Section 6.2.8.2	Added noise and lighting to permanent indirect impacts list	Correction
Section 5.5.1.2	Correct scientific names for species	Correction
Section 5.5.1.2	Update	Update
Section 6.2.1	Added reference to mitigation measures	Update
Section 6.2.1	Updated discussion of Temporary and Permanent Direct Impacts	Response to Comments
Section 6.2.2	Updated discussion of Impact SP-2 Permanent Direct Impacts to Special Status Plant Species	Update
Table 6-1	Updated information regarding San Diego goldenstar and additional County list A and B Species	Update
Section 6.2.1 and Section 6.2.2.2	Added reference to California Fish and Game Code Section 3503	Clarification
Section 6.2.2.1	Expanded discussion to clarify/reiterate that permanent direct impacts to special-status species are less than significant	Clarification, Response to Comment
Table 6-2	Update plant names and significance of impacts	Update
Section 6.2.3.2	Updated discussion of impacts to County Group 2 species for clarification	Clarification
Section 6.2.5	Update on Impact W-3	Update

Appendix 4.1-16 (Continued)

Summary of Appendix 4.1-4 Otay Ranch Village 14 and Planning Areas 16 & 19 LEA Biological Resources Technical Report Text Changes

Section (Page)	Change	Reason for Change
Section 6.2.8.1	Added M-BI-19	Clarification
Section 6.2.11	Update Project Effects Relevant to Guidelines 4.1.K	Update
Section 6.2.12	Update Project Effects Relevant to Guidelines 4.1.L	Update
Section 6.3	Added reference to mitigation measures	Update
Section 6.3.1	Clarification on Otay Ranch Resort Village	Clarification
Section 6.4	Updated Mitigation Measure M-BI-3	Response to Comment
Section 6.4	Updated Mitigation Measure M-BI-6	Update
Section 6.4	Updated Mitigation Measure M-BI-7	Update
Section 6.4	Updated Mitigation Measure M-BI-10	Update
Section 6.4	Updated Mitigation Measure M-BI-11	Clarification
Section 6.4	Updated Mitigation Measure M-BI-17	Response to Comment
Section 7.2.5	Clarified Guideline 4.2.E does not apply	Clarification
Section 9.2.1	Clarified temporary impacts to habitat connectivity and wildlife corridors and corrected significance terminology.	Clarification and correction
Section 9.2.3	Clarification	Clarification
Section 9.2.4	Added noise and lighting to permanent indirect impacts list	Clarification
Section 10.2.5.4	Updated information regarding Otay Ranch RMP	Update
Section 10.2.5.5	Clarified essential public project	Clarification
Table 10-3	Added wetland deviation requirement for impacts to City wetlands	Clarification
References	Added new reference on Vernal Pools	Update
Appendix J-1	Revised Bell's sage sparrow potential to occur from moderate to high	Clarification
Appendix J-1	Revised red diamond rattlesnake name	Clarification
Appendix J-2	Update row containing information on spotted bat	Update
Appendix J-2	Update row containing information on sandstone night lizard	Update
Preserve Appendix Section 2.2	Updated text on habitat types and California Vegetation Alliances and Association	Update
Appendix L Wildlife Corridors Memo	Added Appendix L	Update

Appendix 4.1-16 (Continued)

Summary of Appendix 4.1-7 LEA Greenhouse Gas Technical Report Text Changes

Section	Change	Reason for Change
Executive Summary (ix)	Total construction related greenhouse gas emissions were updated.	Additional calculations captured in the Thematic Response to Blasting and Response to comment O-6-156
1.2.5	The following PDFs were added: PDF-AQ/GHG-6 Efficient Outdoor lighting, PDF-AQ/GHG-7 Energy Efficiency Education, PDF-AQ/GHG-8 Cool Roads, and PDF-AQ/GHG-9 Cool Pavements.	Response to comment O-6-193
1.2.5	PDF-AQ/GHG-6 was changed to PDF-AQ/GHG-10	New PDFs AQ/GHG-6, 7, and 8 were added as a response to comment O-6-193
1.2.5	PDF-AQ/GHG-10 was amended to include additional electrical vehicle charging infrastructure.	Response to comment O-5-86
1.2.5	Additional text was added to PDF-TR-1 to ensure implementation and monitoring of the vehicle miles traveled reduction included in the project design feature.	Response to comment O-6-160
1.2.5	Additional text was added to PDF-UT-4 to clarify the water reduction goals	Update
1.2.5	PDF-UT-5 Outdoor Watering was added.	Response to comment O-6-193
4.2.2	Criteria air pollutant was changed to greenhouse gas	Typographical error
4.2.6	Criteria air pollutant was changed to greenhouse gas	Typographical error
4.2.8	A discussion of blasting was added to the Technical Report.	Response to comment O-6-156
4.3.6	Removed reference to recycled water.	Response to comment O-5-82
4.3.6	Table 17 was updated to reflect the new PDFs added in response to comments.	Consistency with edits made in response to various comments.
5.1.2	Total construction related greenhouse gas emissions were updated.	Additional calculations captured in the Thematic Response to Blasting and Response to comment O-6-156.
5.1.4	Additional text was added to M-GHG-1 to clarify the geographic priority of carbon offsets.	Response to comment O-7-65
5.1.4	M-GHG-4 updated to include the additional PDFs added in response to comments.	Response to comment O-6-193
5.1.4	Total emissions updated	Additional calculations captured in the Thematic Response to Blasting and Response to comment O-6-156.
5.2.4	Total construction emissions updated	Additional calculations captured in the Thematic Response to Blasting and Response to comment O-6-156.

Appendix 4.1-16 (Continued)

Summary of Appendix 4.1-7 LEA Greenhouse Gas Technical Report Text Changes

Section	Change	Reason for Change
5.1.4	Additional text was added to M-GHG-2 to add a public review component to the "true-up" provision.	Response to comment O-6-177
6	Three additional blasting citations were added.	Response to comment O-6-156

Summary of Appendix 4.1-9 Otay Ranch Village 14 and Planning Areas 16 & 19 LEA Transportation Impact Study Text Changes

Section	Change	Reason for Change
Table 3.1	Changes to Signal Delay and LOS.	Intersection signal timings updated to the most recent CalTrans timings
Table 3.4	Freeway volume, V/C, LOS	Update to reflect 2016 freeway volumes per Caltrans request
Table 5.1	Changes to Signal Delay and LOS.	Intersection signal timings updated to the most recent CalTrans timings
Table 5.4	Freeway volume, V/C, LOS	Update to reflect 2016 freeway volumes per Caltrans request
Table 6.2	Changes to Signal Delay and.	Intersection signal timings updated to the most recent CalTrans timings
Table 7.1	Changes to Signal Delay and LOS.	Intersection signal timings updated to the most recent CalTrans timings
Table 8.3	Changes to Signal Delay and LOS.	Intersection signal timings updated to the most recent CalTrans timings
Table 12.1	Intersection LOS (Summary)	Update to reflect changes from all tables above
Table 12.4	Freeway LOS (Summary)	Update to reflect 2016 freeway counts per Caltrans request
Appendix A	New freeway counts / new signal timing plan	Appendix has been replaced to reflect updated freeway counts / signal timing plan
Appendix B	Updated synchro worksheet	Update to reflect new analysis results from updated SR-125 signal timing plan
Appendix F	Updated synchro worksheet	Update to reflect new analysis results from updated SR-125 signal timing plan
Appendix J	Updated synchro worksheet	Update to reflect new analysis results from updated SR-125 signal timing plan
Appendix L	Updated synchro worksheet	Update to reflect new analysis results from updated SR-125 signal timing plan
Appendix N	Updated synchro worksheet.	Update to reflect new analysis results from updated SR-125 signal timing plan

MEMORANDUM

To: Greg Mattson, County of San Diego
From: Rose Kelly, Dudek
Subject: Land Exchange Alternative Air Quality and GHG Technical Report Errata
Memo
Date: August 20, 2018
cc: Sean Kilkenny, Dudek
Attachment(s): Attachment A – Greenhouse Gas Emissions from Blasting Calculations

During the public comment period on the Draft Environmental Impact Report (DEIR) for the Otay Ranch Village 14 and Planning Areas 16/19 project (“Proposed Project”), no comments on the Land Exchange Alternative (LEA) were received by the County of San Diego (County). Although the County did not receive public comments on the LEA, the County felt that, due to the level of technical analysis performed on the LEA during the development of the Draft EIR, where comments on the Proposed Project applied to the LEA, those comments should be noted and incorporated into the record.

As explained in Section 4.1 of the Draft EIR, the LEA was formally submitted as a previous project in 2015 to the County. This submittal included a Tentative Map and Preliminary Grading Plan, technical studies, and supporting documents, as required by the Otay Ranch GDP/SPR. The applicant rescinded the application in 2016. The Land Exchange Alternative analysis represents a more refined analysis than the other four alternatives due to the substantial previous work efforts in support of the land exchange, and is a more detailed analysis than required by CEQA for alternatives. Accordingly, this memo presents information on the LEA which are provided in response to comments on the Draft EIR.

GREENHOUSE GAS EMISSIONS FROM BLASTING

As described in **Thematic Response –Blasting Emissions**, there are no industry standard GHG emission factors to estimate greenhouse gas (GHG) emissions from use of ammonium nitrate fuel oil (ANFO, composed of ammonium nitrate with 5.8%–8% fuel oil) during blasting activities. A carbon dioxide (CO₂) emission factor for consumption of fuel oil from The Climate Registry was used to estimate GHG emissions. The Climate Registry emission factor is 0.01035 of metric tons (MT) of CO₂ per gallon of fuel oil (The Climate Registry 2018). The following assumptions were

also applied to estimate GHG emissions based on The Climate Registry CO₂ emission factor: 6% composition of fuel oil #2 in ANFO and 7.41 pounds of fuel oil per gallon. Consistent with the analysis presented in Draft EIR Section 2.3, Air Quality, 8.25 tons of ANFO were assumed per blast. Based on The Climate Registry assumptions, it was determined that GHG emissions would be 1.38 MT CO₂ per blast. GHG emissions from blasting in the LEA is presented in Table 1.

Table 1
Greenhouse Gas Emissions Blasting Emissions

Phase	Blasts per Phase	CO ₂ Emissions
Proctor Valley Road North	1.7	2.3
North Village	73.1	101.0
Central Village	34.3	47.5
South Village	11.2	15.5
Total	120.3	166.25

Notes: Details are included in Attachment A

As shown in Table 1, 166.25 MT of CO₂e would need to be added to the emissions presented in the Greenhouse Gas Emissions Technical Report for the Land Exchange (Draft EIR Appendix 4.1-7). This would result in a total of 8,154 MT of CO₂e from construction of the LEA. The analysis in Chapter 4.8 of the Draft EIR remains otherwise unchanged and the same findings would apply.

PROJECT DESIGN FEATURES

In response to comments five additional project design features (PDFs) were added to the Proposed Project. The same five PDFs would be added to the LEA. None of the PDFs were quantified in the Proposed Project technical analyses and, therefore, these would not reduce the emissions presented in the Air Quality and Greenhouse Gas Emission Technical Report for either the Proposed Project or the LEA. The additional PDFs are re-stated below:

1. **Efficient Outdoor Lighting.** Prior to the issuance of permits, the Proposed Project applicant or its designee shall submit building plans that demonstrate that all outdoor lighting shall be LED (light emitting diodes) or use other high efficiency lightbulbs
2. **Energy Efficiency Education.** All new home packets shall provide information on energy efficiency, energy efficient lighting and lighting control systems, energy management, and existing energy incentive programs.
3. **Cool Roofs.** Prior to the issuance of residential building permits, the Proposed Project applicant or its designee shall submit building plans illustrating that residential structures

shall meet the U.S. Green Building Council standards for cool roofs. This is defined as achieving a three-year solar reflectance index (SRI) of 64 for a low-sloped roof and an SRI of 32 for a high- sloped roof.

Prior to the issuance of non-residential building permits, the Proposed Project applicant or its designee shall submit building plans illustrating non-residential structures shall meet the U.S. Green Building Council standards for cool roofs. This is defined as achieving a three-year SRI of 64 for a low-sloped roof and 32 for a high- sloped roof.

4. **Cool Pavements.** Prior to the issuance of building permits, the Proposed Project applicant or its designee shall submit building plans illustrating that outdoor pavement, such as walkways and patios shall use paving materials with three-year SRI of 0.28 or initial SRI of 0.33.
5. **Outdoor Watering.** Homeowner's Associations shall appropriately regulate the use of water for cleaning outdoor surfaces and vehicles through the Covenants, Conditions, and Restrictions.

Additionally, two existing PDFs in both the Proposed Project were modified in response to comments. Similar to the additional PDFs, these modifications would be included in the LEA, but would not be quantified. These two modified PDFs are listed below in ~~strikeout~~/underline:

1. **Electric Vehicle Charging Stations.** Prior to the issuance of residential building permits, the Proposed Project applicant or its designee shall submit plans for the installation of a dedicated 208/240 dedicated branch circuit will be included in each garage and one Level 2 electric vehicle (EV) charging station in the garage in half of all residential units to San Diego County for review and approval. Prior to the issuance of non-residential building permits, the applicant or its designee shall submit plans for the installation of ten (10) Level 2 EV charging stations in parking spaces located in the Village Core's commercial development area and P1 through P4 park areas to San Diego County for review and approval.
2. The Proposed Project applicant ~~proposes shall implementation implement of~~ a Transportation Demand Management (TDM) Program to facilitate increased opportunities for transit, bicycling, and pedestrian travel, as well as provide the resources, means, and incentives for ridesharing and carpooling. The following components ~~are to~~ shall be included in the TDM Program:

- Develop a comprehensive pedestrian network designed to provide safe bicycle and pedestrian access between the various Proposed Project phases, land uses, parks/open spaces, schools, and the Village Core. Where approved by the appropriate jurisdiction, the pedestrian network would also provide connections to the various recreational trails/pathways and multi-modal facilities accessing the Project Area.
- Provide bicycle racks along main travel corridors adjacent to commercial developments and at public parks and open spaces within the Project Area.
- Coordinate with San Diego Association of Governments' (SANDAG's) iCommute program for carpool, vanpool, and rideshare programs that are specific to the Proposed Project.
- Promote available websites providing transportation options for residents and businesses.
- Create and distribute a "new resident" information packet addressing alternative modes of transportation.
- Coordinate with San Diego Metropolitan Transit System and SANDAG about the future siting of transit stops/stations within the Project Area.
- Provide a school carpool program by coordinating with the local school district and SANDAG. Provide dedicated parking space for the school carpool program at the Village Core.
- Implement a school bus program in coordination with the school district.
- Homeowner's associations (HOAs) within the Project Area would be required to coordinate with the local school district and partner with the on-site elementary school to create a "walking school bus program" for neighborhood students to safely walk to and from school. The Proposed Project applicant would also coordinate with the local school district to encourage the provision of bicycle storage facilities at the on-site elementary school.

To ensure that the TDM Program strategies are implemented and effective, a transportation coordinator (likely as part of a HOA) shall be established to monitor the TDM Program, and shall be responsible for developing, marketing, implementing, and evaluating the TDM Program.

ATTACHMENT A

*Greenhouse Gas Emissions from Blasting
Calculations for the Land Exchange Alternative
(Dudek; 2018)*

**Proctor Valley EIR
Blasting Emissions
Phase PV Rd North**

Anticipated blasting activities is assumed to include the following:

Assumptions:

- 15,000 cubic yard/blast
- 1 blast/day
- 8.25 ton explosives/per 15,000 CY blast (maximum blast)
- 11.24 feet average depth

Project Phase Estimates:

- 25,000 total cubic yard/phase
- 1.7 total blasts
- 13.75 total ton explosives/phase
- 8.25 maximum ton explosives/day
- 2,224 total square feet blasted/phase
- 1,335 maximum square feet blasted/day

Emissions Calculations:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (ton/year)
ROG	1	N/A	lb/ton	—	—	—
NOx	1	17	lb/ton	140.25	233.75	0.12
CO	1	67	lb/ton	552.75	921.25	0.46
SOx	1	2	lb/ton	16.50	27.50	0.01
PM ₁₀	2	—	lb/blast	0.35	0.76	0.00
PM _{2.5}	2	—	lb/blast	0.02	0.04	0.00

Source/Reference:

1. AP-42, Section 13.3, Table 13.3-1 for ANFO.
2. AP-42, Section 11.9, Table 11.9-1.
 $PM_{10} = 0.52 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.
 $PM_{2.5} = 0.03 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.

Notes:

lb = pounds

GHG Emissions Calculation Comparison:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (MT/year)
CO ₂	1	10.35	kg/gallon	--	--	2.30
CO ₂	2	0.1670	MT/MT	--	--	2.08

Source/Reference:

1. The Climate Registry. 2018 Emission Factors. Table 12.1 U.S. Default Factors for Calculating CO2 Emissions from Combustion of Fossil Fuel and Biomass.

2. Australian Government - Department of Heritage Australian Greenhouse Office. *AGO Factors and Methods Workbook*. December 2006

Conversion

Values:

7.41 lbs/gallon fuel oil

6.00% composition of fuel oil #2 in ANFO

10.35 kg CO₂/gallon fuel oil #2

2000 lbs/ton

1000 kg/MT

1.102 tons/MT

Notes:

MT = metric tons

kg = kilograms

lb = pounds

**Proctor Valley EIR
Blasting Emissions
JSP North**

Anticipated blasting activities is assumed to include the following:

Assumptions:

- 15,000 cubic yard/blast
- 1 blast/day
- 8.25 ton explosives/per 15,000 CY blast (maximum blast)
- 11.24 feet average depth

Project Phase Estimates:

- 1,095,819 total cubic yard/phase
- 73.1 total blasts
- 602.70 total ton explosives/phase
- 8.25 maximum ton explosives/day
- 97,493 total square feet blasted/phase
- 1,335 maximum square feet blasted/day

Emissions Calculations:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (ton/year)
ROG	1	N/A	lb/ton	—	—	—
NOx	1	17	lb/ton	140.25	10,245.91	5.12
CO	1	67	lb/ton	552.75	40,380.93	20.19
SOx	1	2	lb/ton	16.50	1,205.40	0.60
PM ₁₀	2	—	lb/blast	0.35	221.61	0.11
PM _{2.5}	2	—	lb/blast	0.02	12.79	0.01

Source/Reference:

- AP-42, Section 13.3, Table 13.3-1 for ANFO.
- AP-42, Section 11.9, Table 11.9-1.
 $PM_{10} = 0.52 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.
 $PM_{2.5} = 0.03 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.

Notes:

lb = pounds

GHG Emissions Calculation Comparison:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (MT/year)
CO ₂	1	10.35	kg/gallon	--	--	101.02
CO ₂	2	0.1670	MT/MT	--	--	91.33

Source/Reference:

- The Climate Registry. 2018 Emission Factors. Table 12.1 U.S. Default Factors for Calculating CO2 Emissions from Combustion of Fossil Fuel and Biomass.

2. Australian Government - Department of Heritage Australian Greenhouse Office. *AGO Factors and Methods Workbook*. December 2006

Conversion

Values:

7.41 lbs/gallon fuel oil

6.00% composition of fuel oil #2 in ANFO

10.35 kg CO₂/gallon fuel oil #2

2000 lbs/ton

1000 kg/MT

1.102 tons/MT

Notes:

MT = metric tons

kg = kilograms

lb = pounds

**Proctor Valley EIR
Blasting Emissions
JSP Central**

Anticipated blasting activities is assumed to include the following:

Assumptions:

- 15,000 cubic yard/blast
- 1 blast/day
- 8.25 ton explosives/per 15,000 CY blast (maximum blast)
- 11.24 feet average depth

Project Phase Estimates:

- 514,697 total cubic yard/phase
- 34.3 total blasts
- 283.08 total ton explosives/phase
- 8.25 maximum ton explosives/day
- 45,792 total square feet blasted/phase
- 1,335 maximum square feet blasted/day

Emissions Calculations:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (ton/year)
ROG	1	N/A	lb/ton	—	—	—
NOx	1	17	lb/ton	140.25	4,812.42	2.41
CO	1	67	lb/ton	552.75	18,966.58	9.48
SOx	1	2	lb/ton	16.50	566.17	0.28
PM ₁₀	2	—	lb/blast	0.35	71.34	0.04
PM _{2.5}	2	—	lb/blast	0.02	4.12	0.00

Source/Reference:

- AP-42, Section 13.3, Table 13.3-1 for ANFO.
- AP-42, Section 11.9, Table 11.9-1.
 $PM_{10} = 0.52 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.
 $PM_{2.5} = 0.03 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.

Notes:

lb = pounds

GHG Emissions Calculation Comparison:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (MT/year)
CO ₂	1	10.35	kg/gallon	--	--	47.45
CO ₂	2	0.1670	MT/MT	--	--	42.90

Source/Reference:

- The Climate Registry. 2018 Emission Factors. Table 12.1 U.S. Default Factors for Calculating CO₂ Emissions from Combustion of Fossil Fuel and Biomass.

2. Australian Government - Department of Heritage Australian Greenhouse Office. *AGO Factors and Methods Workbook*. December 2006

Conversion

Values:

7.41 lbs/gallon fuel oil

6.00% composition of fuel oil #2 in ANFO

10.35 kg CO₂/gallon fuel oil #2

2000 lbs/ton

1000 kg/MT

1.102 tons/MT

Notes:

MT = metric tons

kg = kilograms

lb = pounds

**Proctor Valley EIR
Blasting Emissions
Phase JSP South**

Anticipated blasting activities is assumed to include the following:

Assumptions:

- 15,000 cubic yard/blast
- 1 blast/day
- 8.25 ton explosives/per 15,000 CY blast (maximum blast)
- 11.24 feet average depth

Project Phase Estimates:

- 168,000 total cubic yard/phase
- 11.2 total blasts
- 92.40 total ton explosives/phase
- 8.25 maximum ton explosives/day
- 14,947 total square feet blasted/phase
- 1,335 maximum square feet blasted/day

Emissions Calculations:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (ton/year)
ROG	1	N/A	lb/ton	—	—	—
NOx	1	17	lb/ton	140.25	1,570.80	0.79
CO	1	67	lb/ton	552.75	6,190.80	3.10
SOx	1	2	lb/ton	16.50	184.80	0.09
PM ₁₀	2	—	lb/blast	0.35	13.30	0.01
PM _{2.5}	2	—	lb/blast	0.02	0.77	0.00

Source/Reference:

- AP-42, Section 13.3, Table 13.3-1 for ANFO.
- AP-42, Section 11.9, Table 11.9-1.
 $PM_{10} = 0.52 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.
 $PM_{2.5} = 0.03 \times 0.000014 \times (A)^{1.5}$, where A is the horizontal area blasted.

Notes:

lb = pounds

GHG Emissions Calculation Comparison:

Pollutant	Source	Emission Factor	Units	Maximum Daily (lbs/day)	Annual (lbs/year)	Annual (MT/year)
CO ₂	1	10.35	kg/gallon	--	--	15.49
CO ₂	2	0.1670	MT/MT	--	--	14.00

Source/Reference:

- The Climate Registry. 2018 Emission Factors. Table 12.1 U.S. Default Factors for Calculating CO2 Emissions from Combustion of Fossil Fuel and Biomass.

Conversion

Values:

7.41 lbs/gallon fuel oil

6.00% composition of fuel oil #2 in ANFO

10.35 kg CO₂/gallon fuel oil #2

2000 lbs/ton

1000 kg/MT

1.102 tons/MT

Notes:

MT = metric tons

kg = kilograms

lb = pounds

