

# **AIR DISPERSION MODELING REPORT REVISED SUBMITTAL**

**Hermosa Project**

**South32 Hermosa Inc.**

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# 1. INTRODUCTION

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## 1.1 Background

South32 Hermosa is a mineral exploration and development company focused on the exploration and potential development of the Hermosa Project near Patagonia, Arizona, in Santa Cruz County. On October 21<sup>st</sup>, 2022, South32 Hermosa submitted a Class I permit application to ADEQ for consideration. On November 21<sup>st</sup>, 2022, an initial modeling report was submitted to ADEQ. This final version incorporates all ADEQ comments received and supersedes the prior versions.

## 1.2 Purpose

As part of the minor New Source Review (mNSR) process under Arizona Administrative Code (A.A.C.) R18-2-334, an ambient air quality assessment was conducted via air dispersion modeling to demonstrate that potential impacts from the Hermosa Project will not interfere with attainment or maintenance of any National Ambient Air Quality Standard (NAAQS). The NAAQS are protective of the general public and “at risk” populations.

## 1.3 Pollutants

The following pollutants with NAAQS standards were evaluated in the air dispersion modeling analysis as the Hermosa Project has Potential-to-Emit (PTE) estimates for these pollutants included in the air permit application:

- ▶ Particulate matter less than 10 microns (PM<sub>10</sub>);
- ▶ Particulate matter less than 2.5 microns (PM<sub>2.5</sub>);
- ▶ Carbon Monoxide (CO);
- ▶ Nitrogen Oxides (NO<sub>x</sub>); and
- ▶ Lead (Pb)

Corresponding averaging periods and standards are included in detail in Section 3.1.

## 1.4 Modeling Approach

According to the Arizona Department of Environmental Quality (ADEQ)’s Air Quality Modeling Guidelines for Arizona Air Permits, the modeling analysis is typically performed in the following two steps:

- ▶ Step 1 – A significant impact analysis and, if required;
- ▶ Step 2 – A full impact analysis.

Typically, new facilities with multiple sources require a full impact analysis and as such, South32 Hermosa conservatively completed a full impact analysis. Additional details on the process are included in Section 3.3.

## 1.5 Modeling Protocol

A modeling protocol was submitted to ADEQ on June 20, 2022. After exchange of correspondence and submittal of additional information clarifying the protocol, ADEQ approved the modeling protocol on July 26<sup>th</sup>, 2022.

South32 is submitting revised air dispersion modeling to support the incorporation of ADEQ comments received and to incorporate a few additional changes. The results presented here reflect the changes incorporated into the modeling based on all received ADEQ comments and other design changes.

## **1.6 Other Assessments**

In addition to the air dispersion modeling demonstration assessing primary pollutant impacts, other assessments were conducted to evaluate the impacts of precursor emissions and secondary formation for ozone and particulate matter.

## 2. PROJECT AND SITE INFORMATION

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South32 Hermosa is a mineral exploration and development company focused on the exploration and potential development of the Hermosa Project near Patagonia, Arizona, in Santa Cruz County. The exploration work conducted thus far has shown deposits of zinc (Zn), silver (Ag), manganese (Mn), and lead (Pb), and further exploration work is ongoing. On March 31, 2022, President Biden declared manganese a strategic and critical mineral under the Defense Production Act of 1950, making production of manganese a national priority. Once South32 Hermosa determines the feasibility of the Hermosa Project and makes a subsequent decision to mine, South32 Hermosa will proceed with the expeditious construction and operation of an underground mine that will lead to the above-ground beneficiation of mined ores (zinc, silver, manganese, and lead) into concentrates. These proposed operations are referred to as “the Hermosa Project” and will be located in an area of Santa Cruz County currently designated as attainment or unclassifiable for all national ambient air quality standards (NAAQS).<sup>1</sup>

The proposed Project includes underground mining of two deposits:

- ▶ Taylor sulfide deposit (Taylor), a high-grade Zinc-Lead-Silver deposit
- ▶ Clark oxide deposit (Clark), a high-grade Manganese-Zinc-Silver deposit

Each deposit will have a dedicated main access (for employees and equipment); Taylor will be accessed via a shaft<sup>2</sup>, and Clark will be accessed via a decline.<sup>3</sup> Tailings and rock management will be shared between facilities, while ore will be handled separately. The Hermosa Project includes beneficiation of material from the two deposits. Material beneficiation from the Taylor deposit will involve various ore beneficiation steps including underground crushing and above-ground milling, screening, froth flotation, and regrind, ultimately producing a zinc/lead concentrate. Material from Clark will go through above-ground crushing, ultimately producing crushed ore. All products (concentrates and crushed ore) will be shipped off-site for further beneficiation. Tailings from the Taylor facility will be thickened, filtered, and returned underground to backfill voids as cemented paste backfill or dry stacked in either of the tailing storage facilities (TSF1 or TSF2).

The proposed Hermosa Project includes sufficient onsite power to meet project needs utilizing natural-gas and diesel fired reciprocating engines for both the Base Case and proposed Alternate Operating Scenario described below. All potential to emit estimates included full site build-out as the Base Case. The Base Case is not, however, fully representative of initial conditions or South32 Hermosa’s preferred development approach. South32 Hermosa is thus proposing two alternate operating scenarios (AOS), as well as two additional power generation options, to ensure that its application is fully representative of possible conditions:

- ▶ Alternate Operating Scenario No. 1 – Line Power Alternative: South32 Hermosa is including the use of supplied line power with the onsite power generation as backup power as an AOS in the event line power should become available.
- ▶ Alternate Operating Scenario No. 2 – Second Tailing Storage Facility: South32 Hermosa is including the development of a second TSF (TSF2) on National Forest lands located to the north and east of the

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<sup>1</sup> Per Arizona Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants, Green Book, Environmental Protection Agency (EPA).

<sup>2</sup> A vertical excavation through which personnel and material can move between the surface and the mine.

<sup>3</sup> A gradually-sloped, sometimes spiraled tunnel providing access to an underground mine.



proposed Project as a supplement to the existing TSF (TSF1). Addition of the second TSF requires approval from the Coronado National Forest through the approval of the Mine Plan of Operations (MPO) submitted to United States Forest Service (USFS) on August 17, 2023.

The modeling report and model files reference the Base Case as Plan I and operation of TSF2 as Plan II.

For each operating scenario proposed, the modeling has been revised to incorporate the two power generation options based on two different engine models for this site. Both modeled scenarios also include 12 diesel fired engines throughout the facility, including five ICE engines subject to a voluntary limit of 500 hours/year, along with the following options:

- ▶ Option 1 - Use of fifty-eight (58) 2.6 MW natural gas engines; OR
- ▶ Option 2 – Use of twenty-seven (27) 4.4 MW natural gas engines.

The associated vendor provided emissions rates have been included as an attachment; Each power generation scenario has been modeled for both Plan I and Plan II, for a total of four different scenarios modeled. The additional backup generators (one (1) each for the 2.6MW and 4.4MW scenarios) referenced in the application are not included in the modeling as no more than 58 natural gas engines and 27 natural gas engines will operate simultaneously for Option 1 and Option 2, respectively.

Because the Hermosa Project is planned as an integral whole, South32 Hermosa is calculating potential to emit based on the highest emissions in either Plan I or Plan II, and the highest emissions from either power generation scenario. There is no planned interruption between plans. Thus, South32 Hermosa is presenting modeling demonstrating that the NAAQS will be maintained in both plans.

Major operations at the Hermosa Project will consist of the following:

- ▶ Underground mining (including drilling, blasting, loading, hoisting, and hauling);
- ▶ Material transfer;
- ▶ Intermediate ore stockpiles;
- ▶ Primary and secondary crushing;
- ▶ Dust collection from drop points;
- ▶ Grinding and screening;
- ▶ Froth flotation and regrind;
- ▶ Concentrate filtration and thickening;
- ▶ Concentrate and crushed ore loading;
- ▶ Tailings filtration; and
- ▶ Tailings deposition/placement.

In addition to the major operations listed above, South32 Hermosa will include the following auxiliary operations at the proposed Hermosa Project:

- ▶ Laboratory operations;
- ▶ Cooling towers (associated with water treatment plant and refrigeration plants);
- ▶ Mechanical evaporators;
- ▶ Paste backfill system;
- ▶ Rock stockpiles;
- ▶ Power generation;
- ▶ Fuel storage tanks;

- ▶ Water and wastewater treatment facilities;
- ▶ Reagents storage; and
- ▶ Vehicle traffic.

Further details regarding the process are provided in the Class I air permit application submitted with this application package.

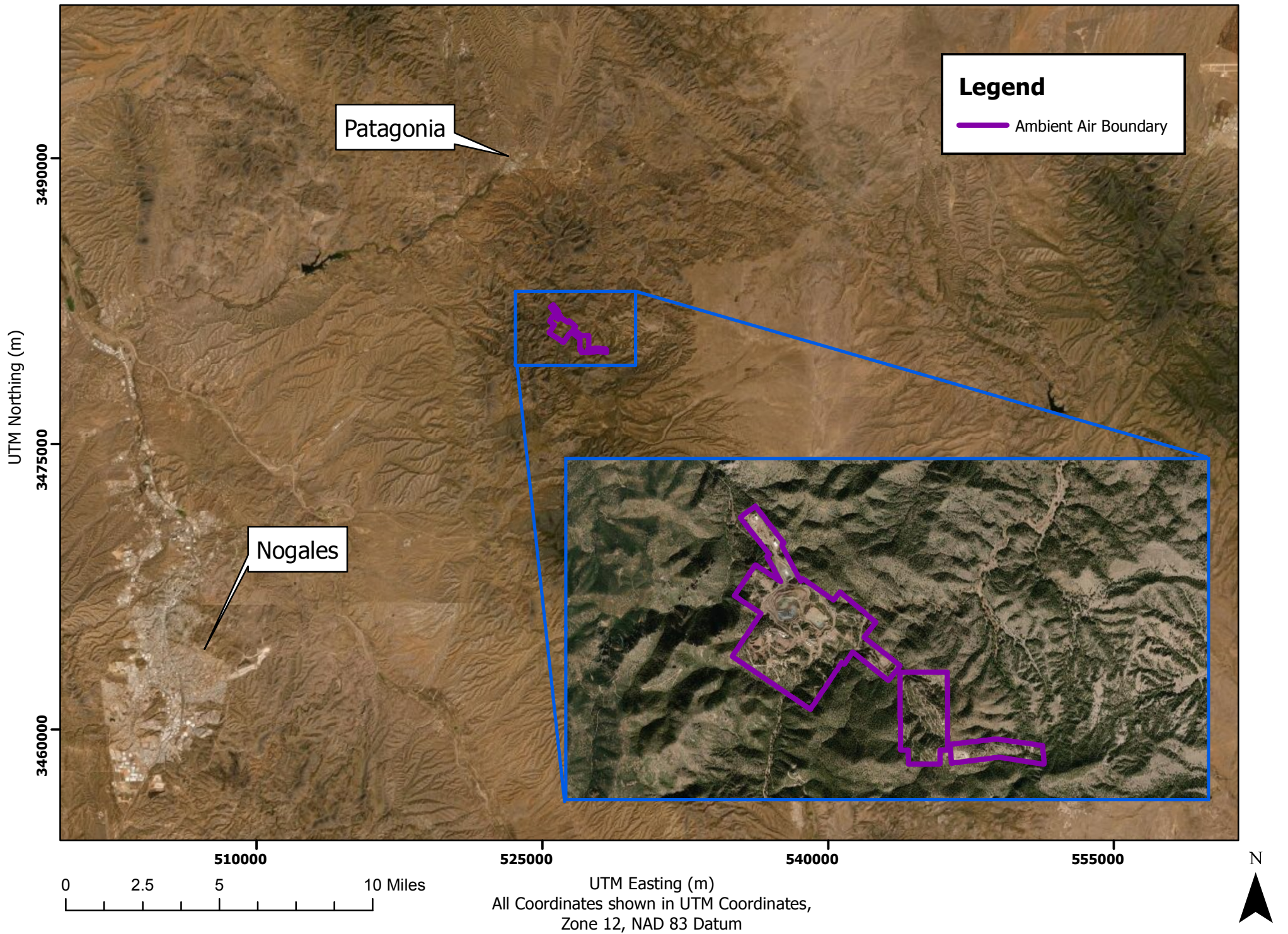
## 2.1 Site Location & Description

The proposed Hermosa Project is located approximately 24 kilometers (~15 miles) east-northeast of Nogales, Arizona in Santa Cruz County. Figure 2-1 and Figure 2-2 provides the general location of the site with respect to southern Arizona as well as surrounding cities and highways. Regionally, the Hermosa Project is located in the northern section of the Patagonia Mountains, a region with a long history of mining and which is characterized by forests and grasslands interspersed with areas of exposed rocks and jutting mountains. The Hermosa Project lies at approximately 1,585 meters above sea level with higher elevations to the north, west, and south. Figure 2-1 through Figure 2-1 include overall site plans during Plan I and Plan II, including property boundaries, as well as zoomed-in maps of the beneficiation areas for Taylor and Clark.

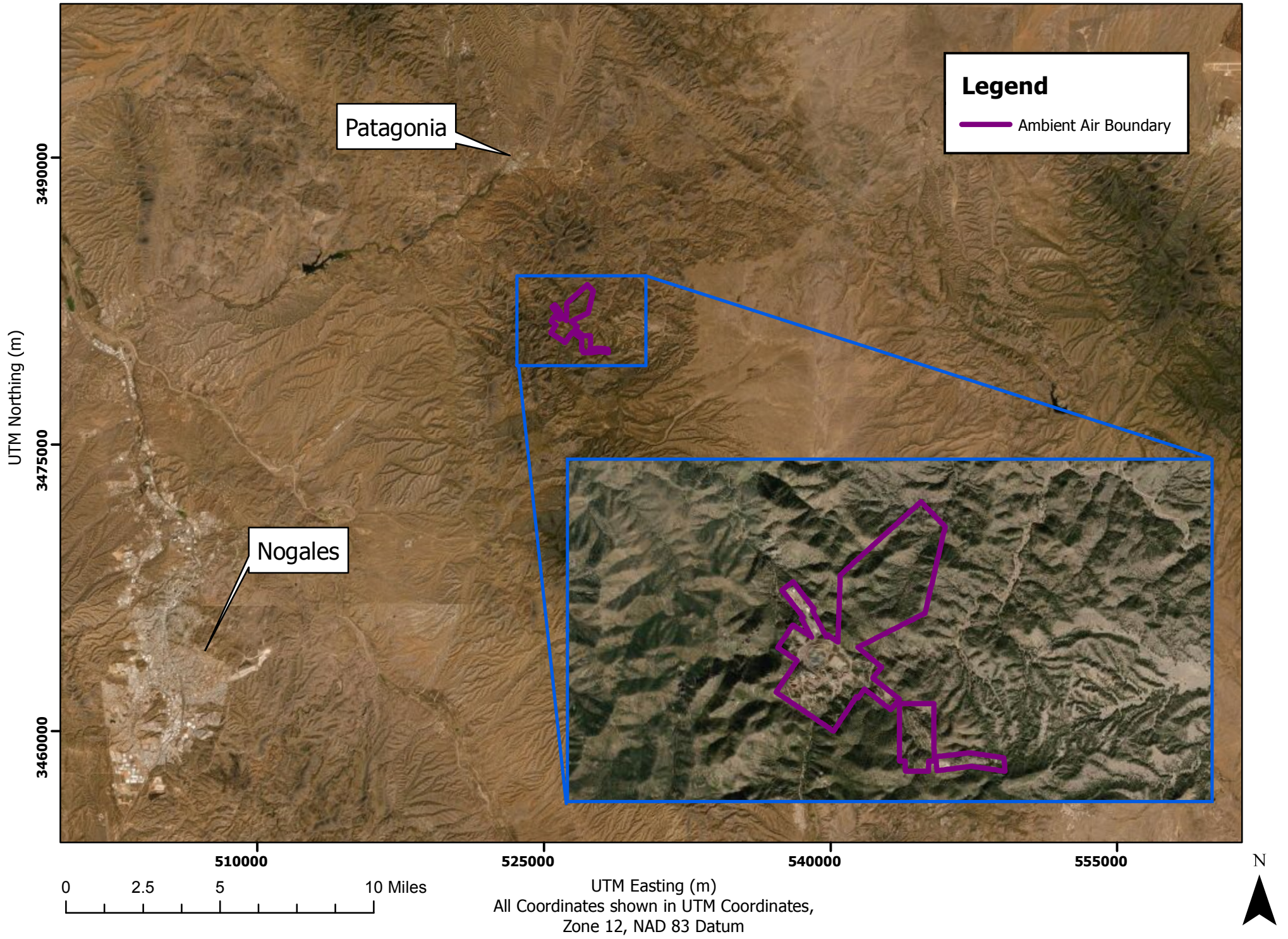
The Hermosa Project site is remote and surrounded by ridges and hills making the site limited in terms of accessibility. Primary access to the site is via Harshaw Road. All publicly accessible areas of the Hermosa Project are, or will be, fenced and/or posted with no trespassing signs and will be monitored for site security. The boundary was based upon a combination of rough terrain, fencing, and security patrols that will effectively preclude entry by the general public. Harshaw Road and areas of surrounding public access will be considered ambient air. There is a section of public roadway that runs through the Hermosa Project and as such, receptors have been included on locations that have public access i.e., public roadways. Access to the Flux Canyon Road within South32's patented lands is restricted through a gate at the northern entrance of the property, and this will be addressed in the Public Access Restriction Plan. The public portions (e.g., those outside South32's patented lands) are addressed by the general receptor grid and are included in the modeling files.

Because the boundary of the Hermosa Project will vary depending upon whether TSF2 is approved by the USFS, this modeling report has evaluated both the base case (TSF1 only) and the alternative case (TSF1 plus TSF2). Separate boundary conditions were established for both cases, and the model run on both cases to assure that the NAAQS are met under both cases. The modeling was run only using the two Base Cases (i.e. Full Generation, 2.6 MW engines and 4.4 MW engine options) alternate operating scenarios as that is the case with maximum emissions, and the alternate operating scenario merely removes some of the engines.

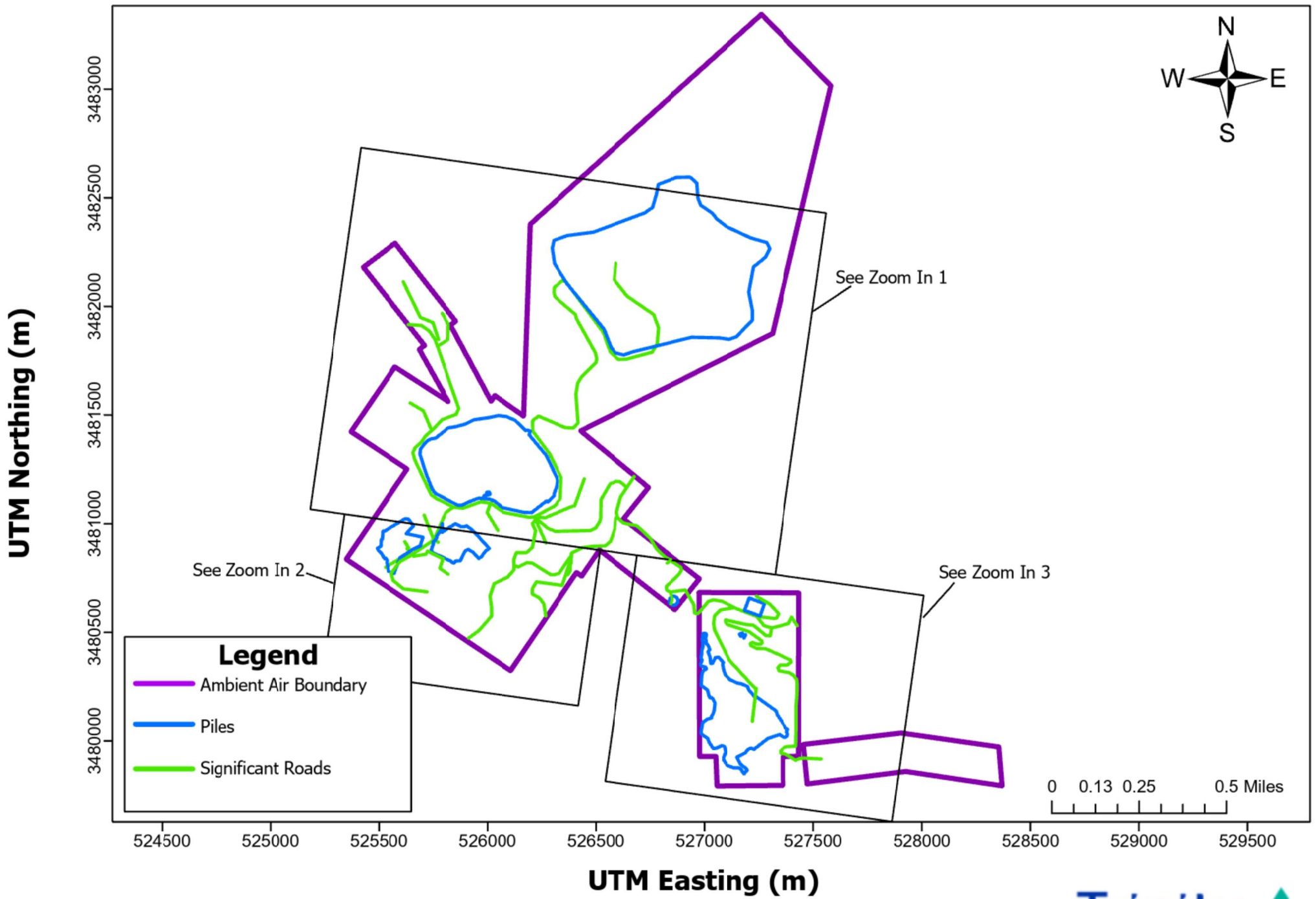
**Figure 2-1. Hermosa Project - Location Map - Plan I**



**Figure 2-2. Hermosa Project - Location Map - Plan II**

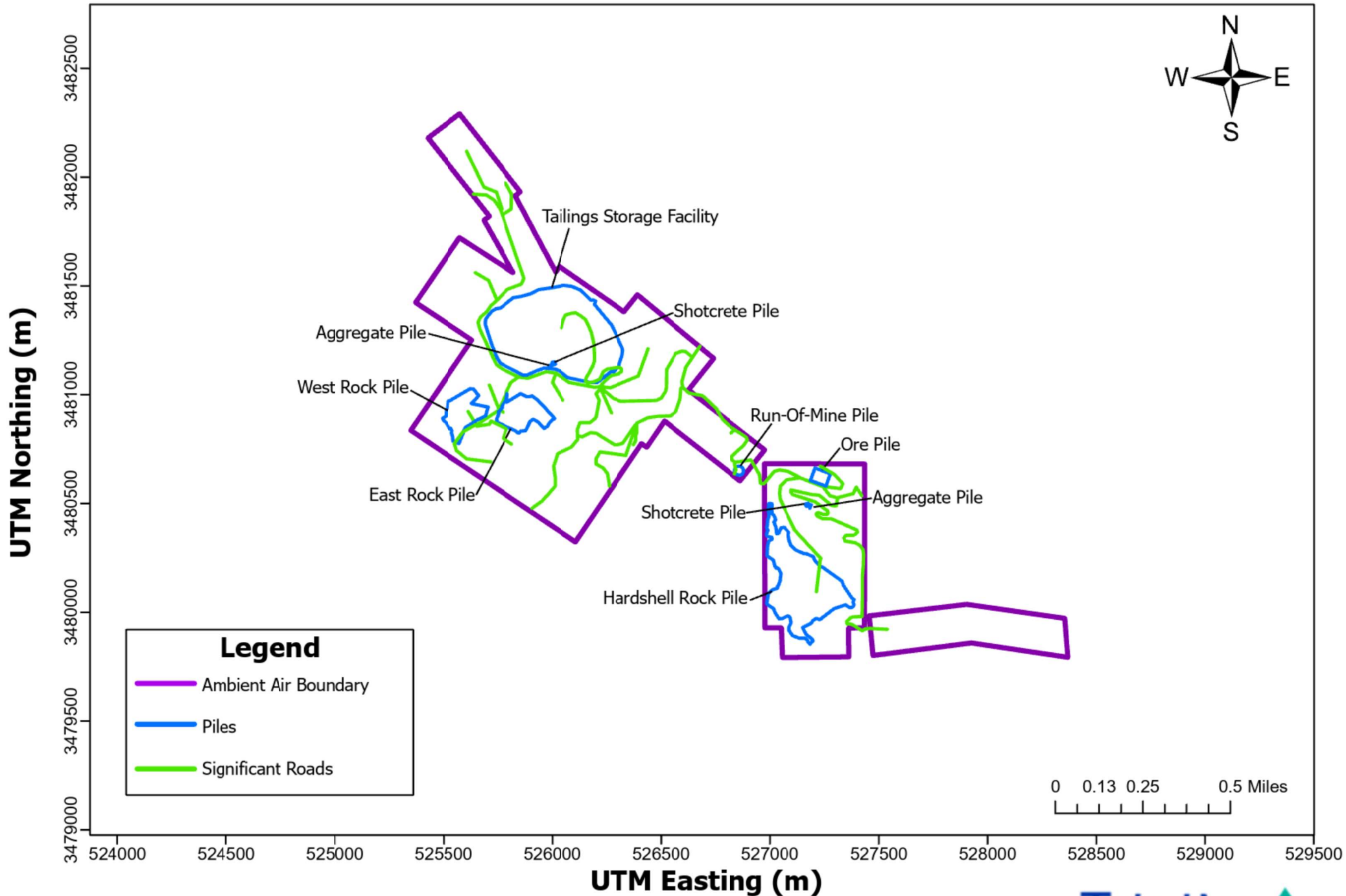


**Figure 2-3. Hermosa Project - Zoom In Locations**



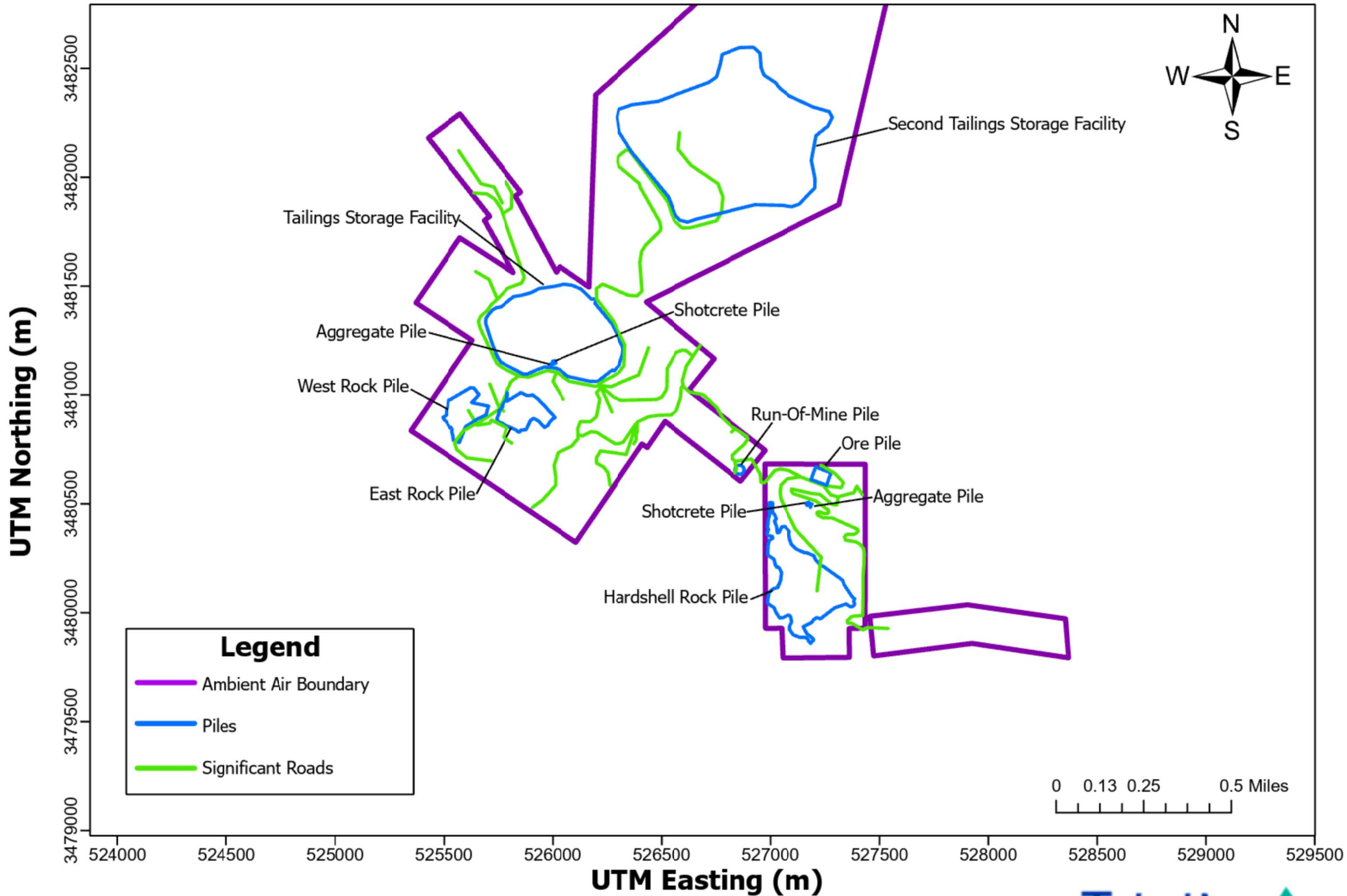
All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

**Figure 2-4. Hermosa Project - Piles and Roads - Plan I**



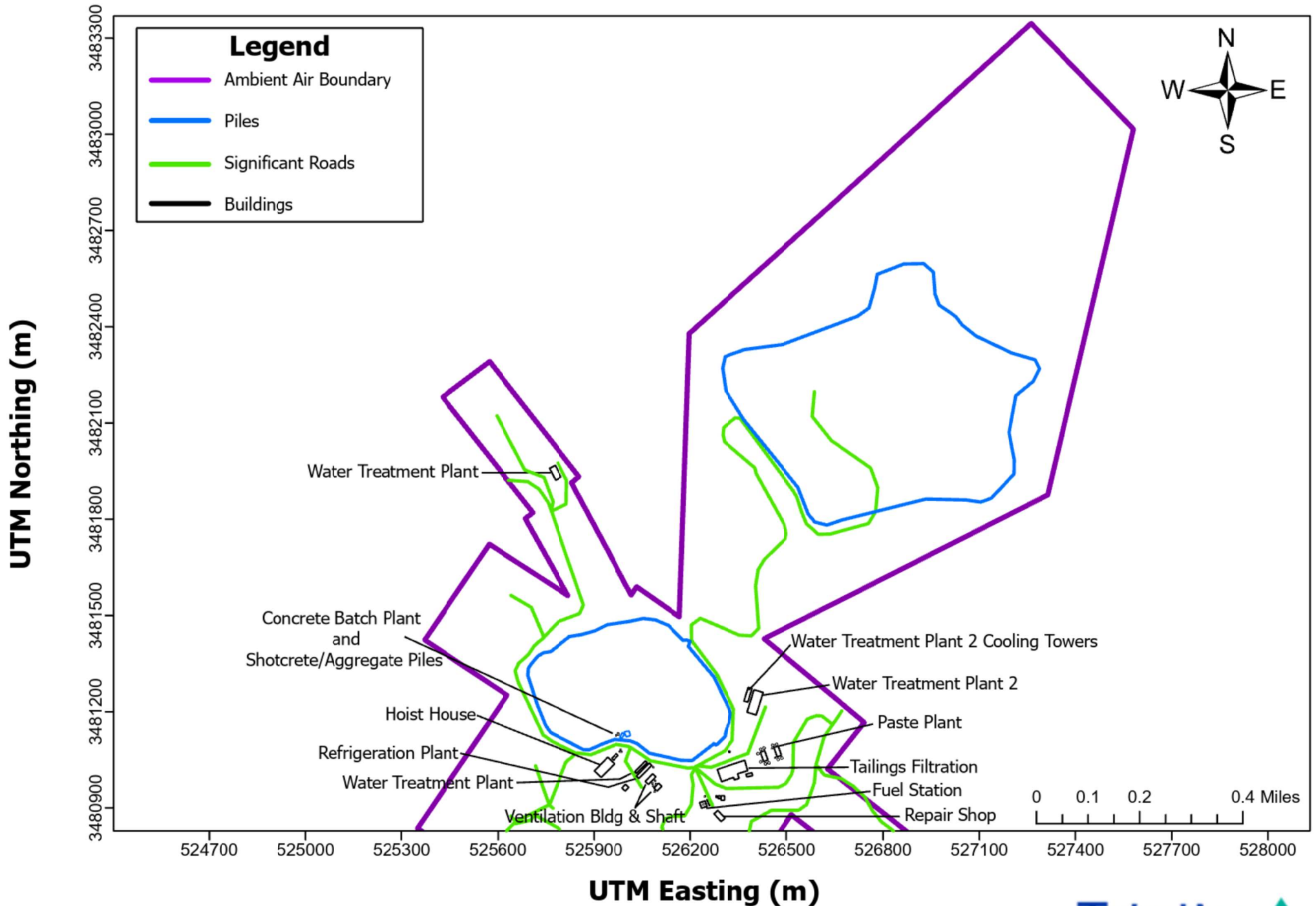
All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

**Figure 2-5. Hermosa Project - Piles and Roads - Plan II**



All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

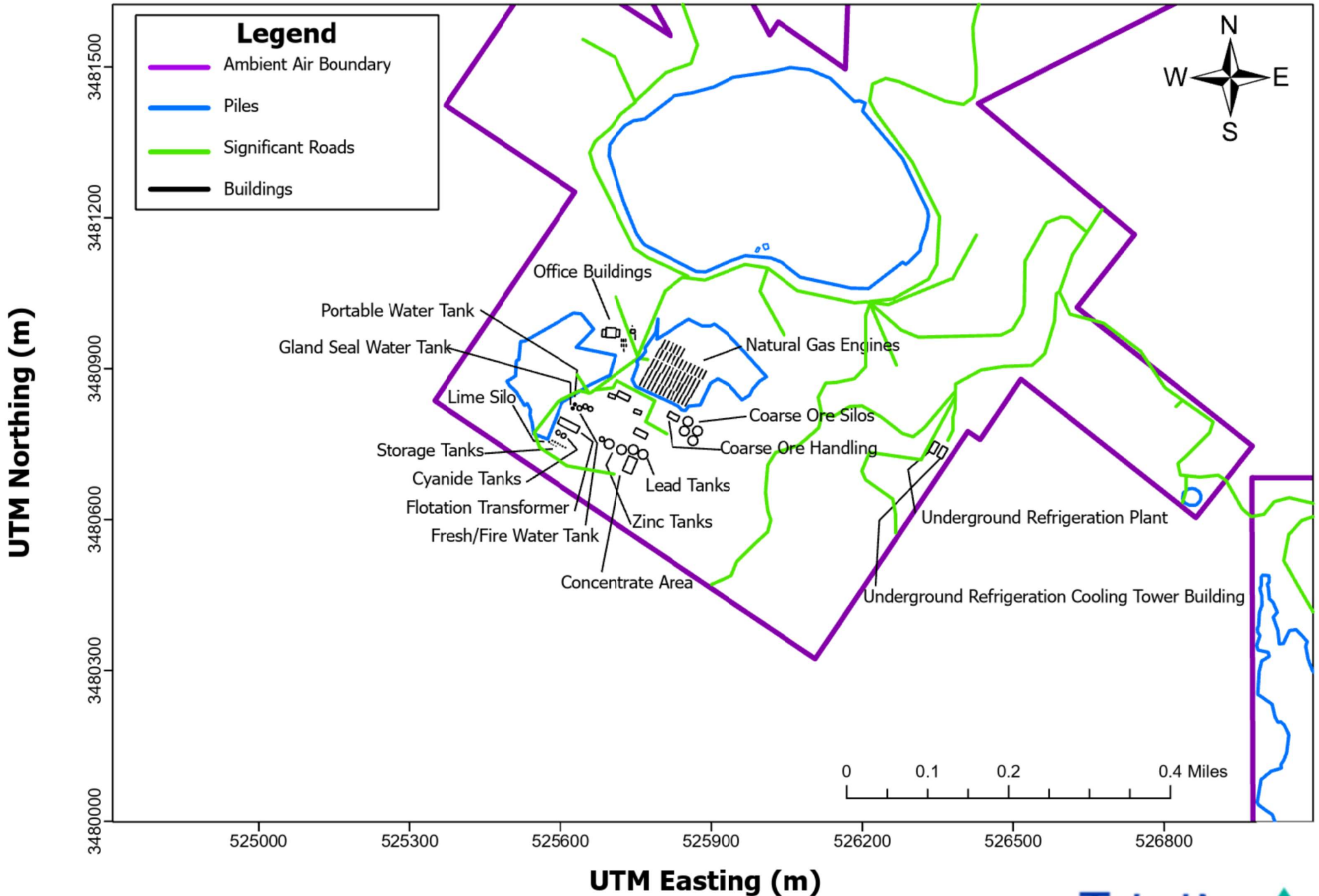
**Figure 2-6. Hermosa Project - Building Zoom In 1**



All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

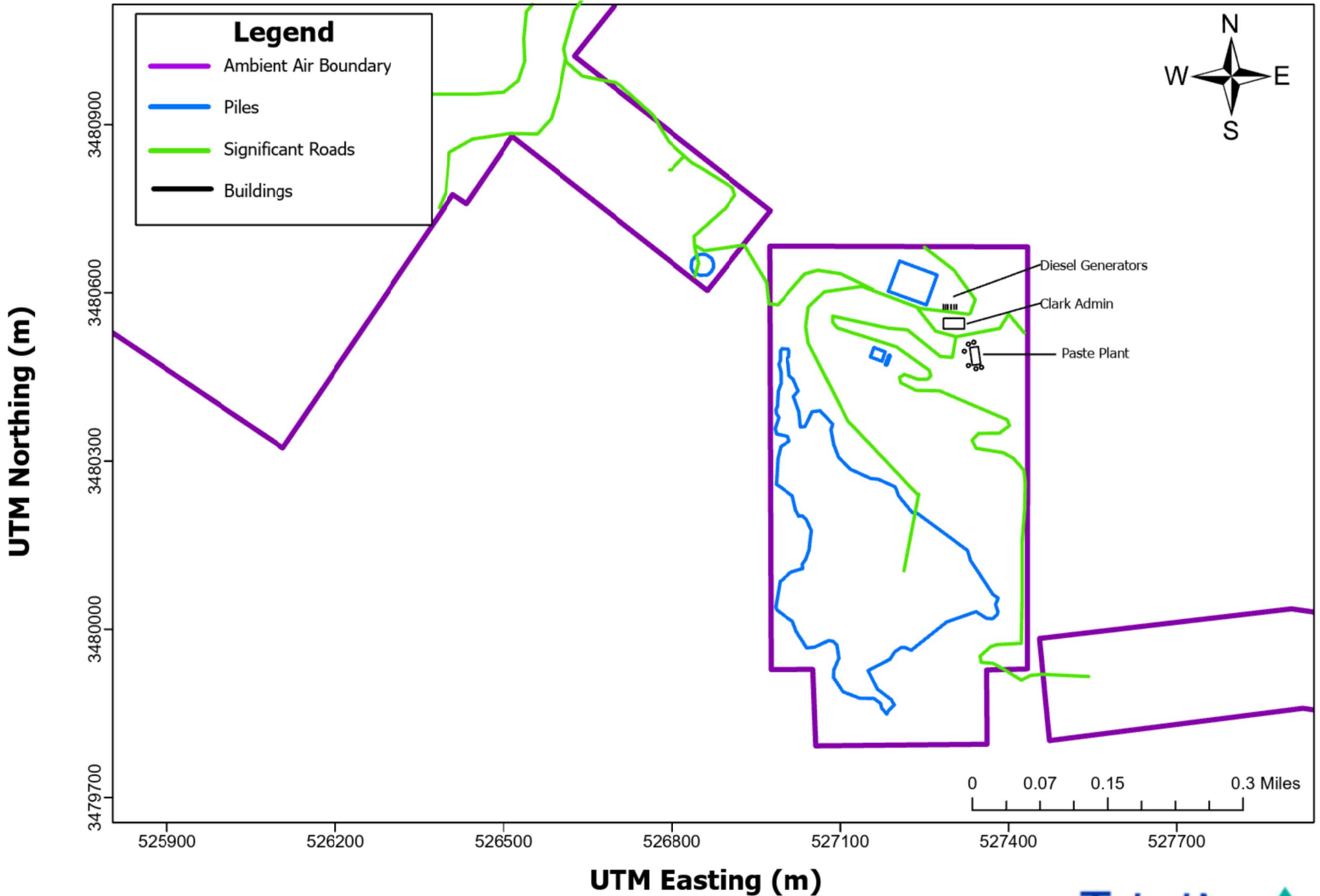


**Figure 2-7. Hermosa Project - Building Zoom In 2**



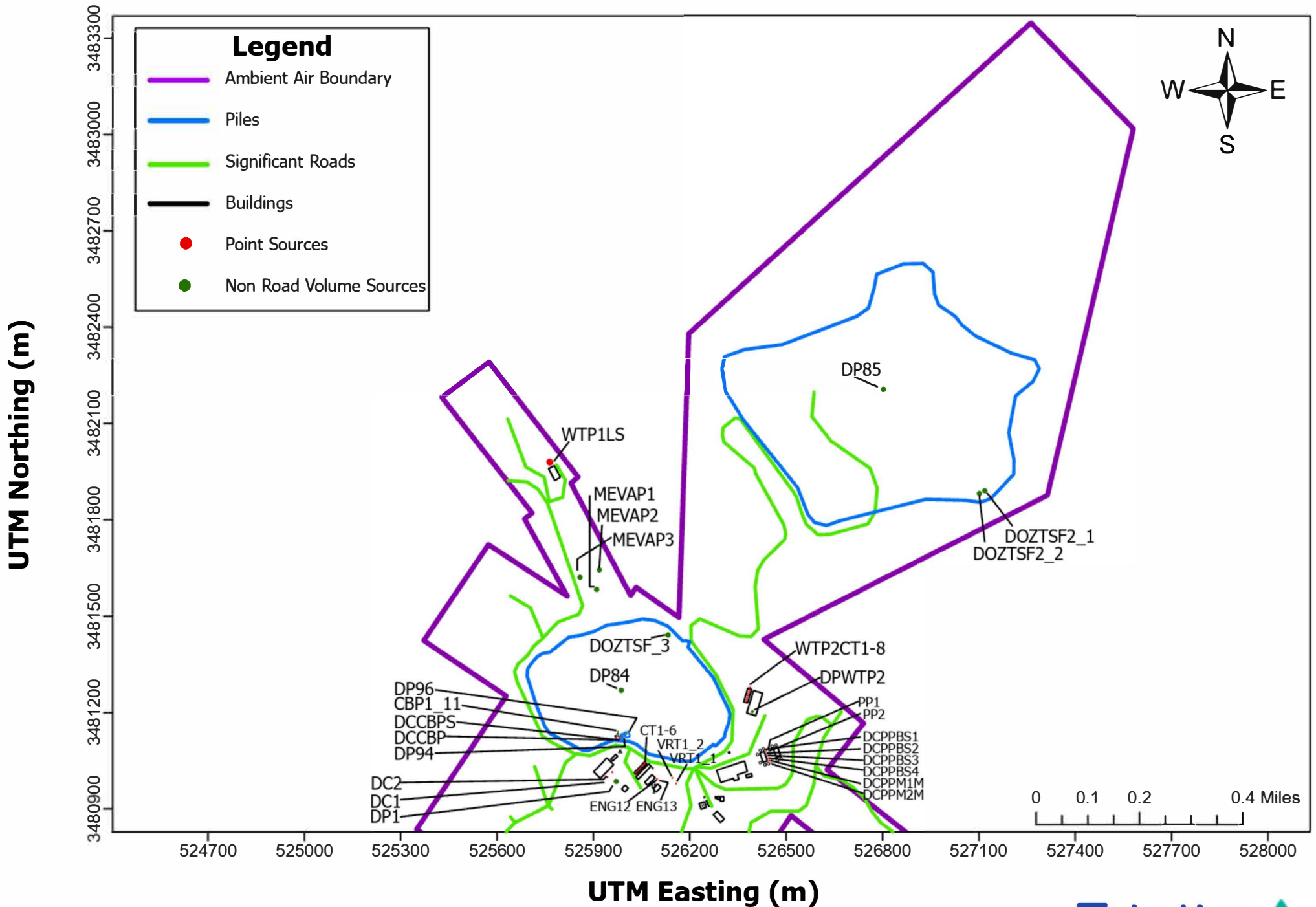
All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

**Figure 2-8. Hermosa Project - Building Zoom In 3**



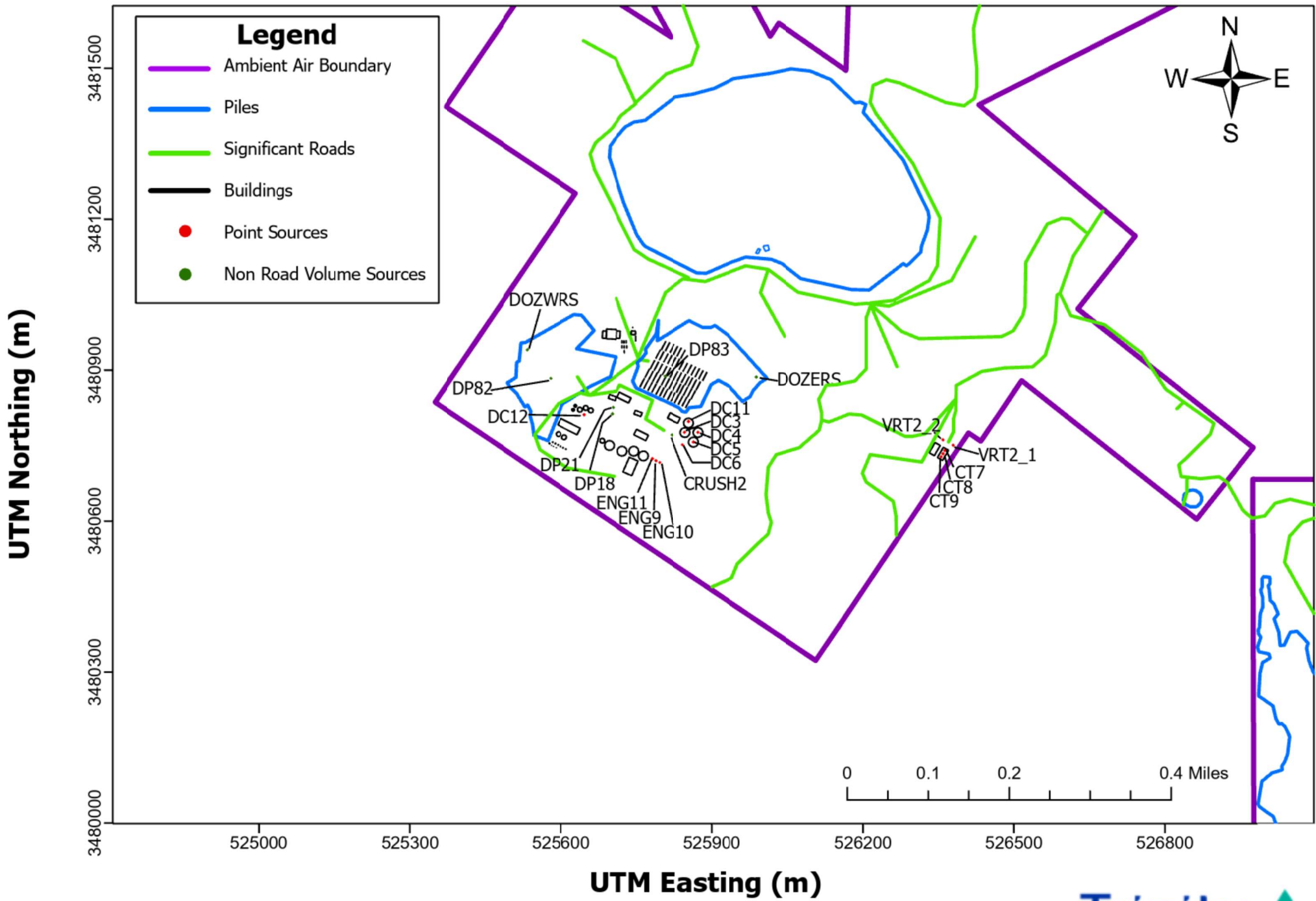
All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

**Figure 2-9. Hermosa Project - Emission Sources Zoom In 1**



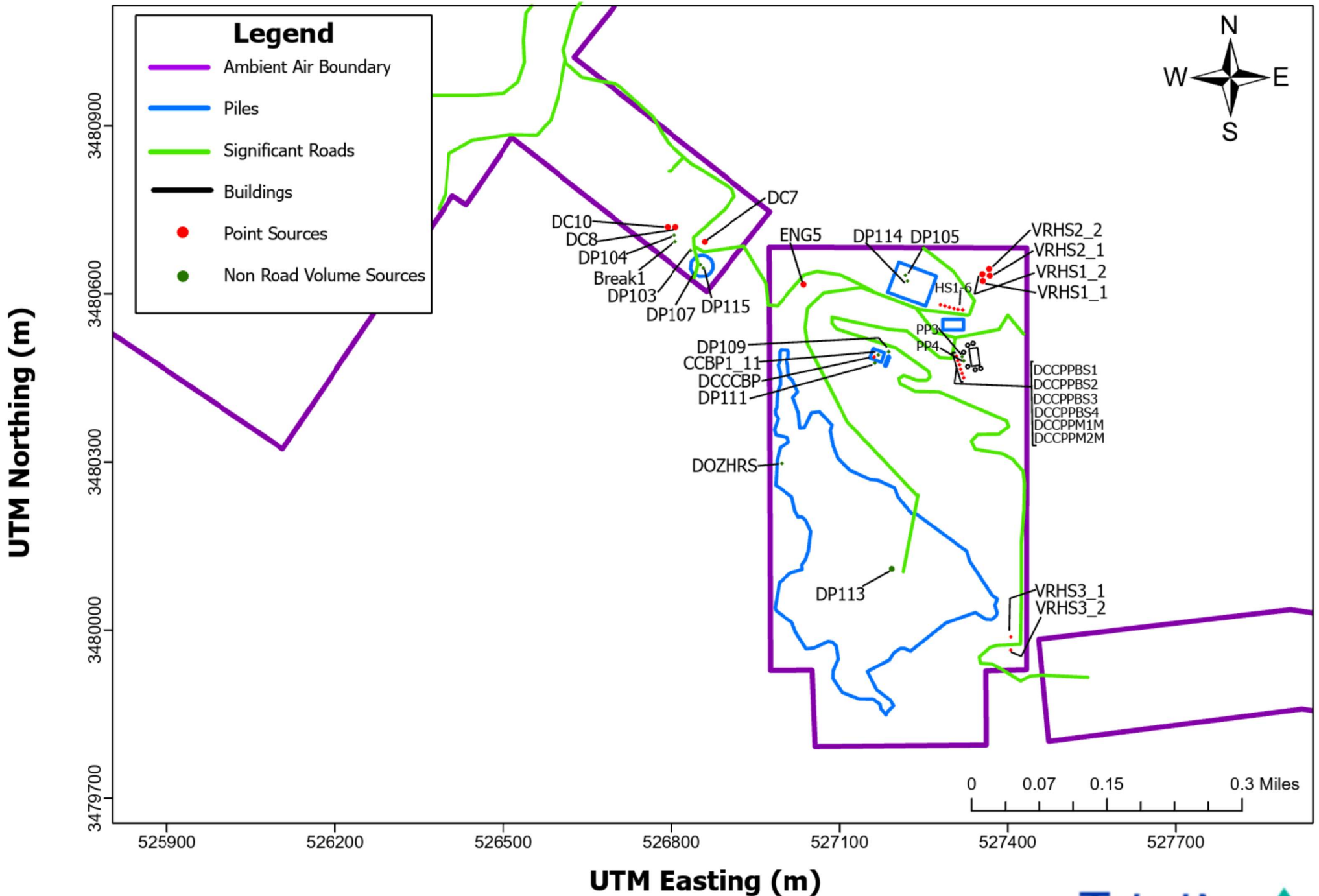
All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

**Figure 2-10. Hermosa Project - Emission Sources Zoom In 2**



All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

**Figure 2-11. Hermosa Project - Emission Sources Zoom In 3**



All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

ID	Description
CT1	Cooling Tower Cell 1
CT2	Cooling Tower Cell 2
CT3	Cooling Tower Cell 3
CT4	Cooling Tower Cell 4
CT5	Cooling Tower Cell 5
CT6	Cooling Tower Cell 6
WTP2CT1	WTP2 CT Cell 1
WTP2CT2	WTP2 CT Cell 2
WTP2CT3	WTP2 CT Cell 3
WTP2CT4	WTP2 CT Cell 4
WTP2CT5	WTP2 CT Cell 5
WTP2CT6	WTP2 CT Cell 6
WTP2CT7	WTP2 CT Cell 7
WTP2CT8	WTP2 CT Cell 8
CT7	UG Refrigeration CT Cell 1
CT8	UG Refrigeration CT Cell 2
CT9	UG Refrigeration CT Cell 3
VRT2_1	Vent Raise - Taylor
VRT2_2	Vent Raise - Taylor
VRT1_1	Ventilation Shaft - Taylor
VRT1_2	Ventilation Shaft - Taylor
DC1	21200-DCD-001
DC2	21300-DCD-002
DC3	21300-DCD-003
DC4	21300-DCD-004
DC5	21300-DCD-005
DC6	21300-DCD-006
DC7	Coarse Ore Dust Collection System,23100-DCD-001 #1
DC8	Coarse Ore Dust Collection System,23100-DCD-005 #2
DC10	Coarse Ore Dust Collection System,23100-DCD-002 #3
VRHS1_1	Ventilation - Exhaust Raises NE Hardshell #1
VRHS1_2	Ventilation - Exhaust Raises NE Hardshell #1
VRHS2_1	Ventilation - Exhaust Raises NE Hardshell #2
VRHS2_2	Ventilation - Exhaust Raises NE Hardshell #2
VRHS3_1	Ventilation - Exhaust Raise SE Hardshell
VRHS3_2	Ventilation - Exhaust Raise SE Hardshell
HS1-2	Diesel Hardshell 1 and 2
HS3-4	Diesel Hardshell 3 and 4
HS5-6	Diesel Hardshell 5 and 6
ENG4	Cummins C100D2RE
ENG5	CUMMINS Power Generation C200D2RE
ENG7	Kubota V2403-M-ET02
ENG8	Perkins 404D-52
ENG9	CAT C175 Substation 1
ENG10	CAT C175 Substation 2
ENG11	CAT C175 Substation 3
ENG12	CAT C175 Shaft 1
ENG13	CAT C175 Shaft 2
DC11	21300-DCD-005 Coarse Ore Silo Collection System collecting dust from entrance to 21500-SLO-004 Coarse Ore Silo No. 4
DP1	Drop of the crushed ore from the mine to the 21200-BIN-001 Mine Shaft Ore Bin
DP2	Drop from 21200-BIN-001 Mine Shaft Ore Bin to 21200-FOR-001 Mine Shaft Ore Discharge Feeder
DP18	Drop from 21700-CVR-008 Primary Mill Feed Conveyor to 22100-CHU-002 Primary Mill Feed Chute
CBP1_11	CBP Plant
DOZTSF21	TSF Dozer 1
DOZTSF22	TSF Dozer 2
DP103	Haul Truck Dump into Primary Crusher Feed Hopper from ROM Stockpile (23100-HPR-0001)
DP104	Drop from Coarse Ore Feed Conveyor to the SAG Mill Feed Chute (23200-CHU-0002)
DP105	Transfer of Development Ore from Ore Stockpile to Loader
DP106	Transfer of Development Ore Mined from Loader to Haul Truck
DP107	Transfer from ROM Stockpile to Loader
DP109	Transfer from Agg Stockpile to Loader
DP110	Transfer of Agg Material from Loader to Haul Truck
DP111	Transfer of Shotcrete Aggregate from Stockpile to Loader
DP113	Hardshell Rock Storage Drop
DP114	Ore Stockpile Drop
DP115	ROM Stockpile Drop
CCBP1_11	Clark CBP Plant

ID	Description
DOZHRS	Dozer on Hardshell Rock Stockpile
CRUSH2	Pebble Crushing
DOZTSF_3	Dozer on TSF_3
DOZWRS	Dozer on West Rock Stockpile
DOZERS	Dozer on East Rock Stockpile
DP82	Drop on West Rock Stockpile
DP83	Drop on East Rock Stockpile
DP84	TSF
DP85	Drops on TSF1
DP94	Transfer from Agg Stockpile to Loader
DP95	Transfer of Agg Material from Loader to Haul Truck
DP96	Transfer of Shotcrete Aggregate from Stockpile to Loader
DPWTP2	WTP2 Reagent Drops inside Building
BREAK1	Clark Rock Breaker
MEVAP1	Mechanical Evaporator 1
MEVAP2	Mechanical Evaporator 2
MEVAP3	Mechanical Evaporator 3
DP21	Drop from 22210-CV-00002 Primary Screen Discharge Conveyor to 22210-CV-0001 Pebble Crusher Feed Conveyor
PP1	Taylor Truck Pneumatic Loadout to Silo 1
PP2	Taylor Truck Pneumatic Loadout to Silo 2
PP3	Clark Truck Pneumatic Loadout to Silo 1
PP4	Clark Truck Pneumatic Loadout to Silo 2

### 3. AIR DISPERSION MODELING APPROACH

As part of the mNSR process under A.A.C. R18-2-334, an ambient air quality assessment was conducted via air dispersion modeling to demonstrate that potential impacts from the Hermosa Project will not interfere with attainment or maintenance of any NAAQS. The NAAQS are standards set by the U.S. Environmental Protection Agency to protect public health and the environment. Primary standards protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards protect public welfare, including visibility and damage to animals, crops, vegetation, and buildings.

A modeling protocol was submitted to ADEQ on June 20, 2022. After exchange of correspondence and submittal of additional information clarifying the protocol, ADEQ approved the modeling protocol on July 26<sup>th</sup>, 2022. South32 is submitting revised air dispersion modeling to support the incorporation of ADEQ comments received and to incorporate a few additional changes. The results presented here reflect the changes incorporated into the modeling based on ADEQ comments and other design changes.

#### 3.1 Full Impact Analysis

A full impact analysis was performed to demonstrate that ambient concentrations from the Hermosa Project combined with representative background concentrations for that pollutant will not interfere with attainment or maintenance of the NAAQS. A full impact analysis was performed for a 50 km grid as a part of the original submittal in November 2022. For this revised submittal, a grid of 10 km was used<sup>4</sup>.

The full impact NAAQS analysis accounts for ambient background concentration of pollutants determined from ambient monitoring data. Per ADEQ’s guidance, an evaluation of off-site inventory sources was not conducted because the Hermosa Project does not trigger the PSD program.<sup>5</sup> The results from direct modeling of Hermosa Project emissions and ambient background concentration were compared to the NAAQS. The pollutants and averaging periods, the corresponding NAAQS used, and the form of the model result to be used for comparison are summarized in **Table 3-1** below based on a three-year meteorological dataset.

**Table 3-1. NAAQS Thresholds**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Class II NAAQS (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Modeling Result<sup>1,2,3</sup></b>
PM <sub>10</sub>	24-hour	150	H4H
PM <sub>2.5</sub>	Annual	12	H1H
	24-hour	35	H8H
NO <sub>2</sub>	Annual	100	H1H
	1-hour	188	H8H
SO <sub>2</sub>	3-hour	1,300	H2H
	1-hour	196	H4H

<sup>4</sup> Approved per email from Feng Mao with ADEQ on 04/18/2023.

<sup>5</sup> Per Arizona Department of Environmental Quality, *Air Dispersion Modeling Guidelines for Arizona Air Quality Permits*, Section 5, November 1, 2019. There are no significant sources in the vicinity of the Hermosa Project that would likely cause concentrations to diverge from the conservative background values chosen.



CO	1-hour	40,000	H2H
	8-hour	10,000	H2H
Pb	3-month (Rolling average)	0.15	H1H

<sup>1</sup> Guideline on Air Quality Models; Final Rule, 40 CFR Part 51, Appendix W, January 17, 2017.

<sup>2</sup> EPA Memo, Applicability of Appendix W Modeling Guidance for the 1-hour NO<sub>2</sub> NAAQS, June 28, 2010.

<sup>3</sup> EPA Memo, Modeling Procedures for Demonstrating Compliance with PM<sub>2.5</sub> NAAQS, March 23, 2010.

### 3.2 Hazardous Air Pollutants Analysis

Per ADEQ’s “Learning Site Policy,” if a facility is within 2 miles or less of a learning site, the facility should submit a modeling analysis to demonstrate compliance with the NAAQS and Acute/Chronic Ambient Air Concentrations (AAAC and CAAC) for listed air toxics.<sup>6</sup> Because there are no learning sites within 2 miles of the Hermosa Project, an analysis of AAAC and CAAC impacts was not required under ADEQ’s Learning Sites Policy.

### 3.3 Voluntary Limits

Pursuant to A.A.C. R18-2-304.F.5, South32 Hermosa may elect to accept voluntary limits in accordance with R18-2-306.01. South32 Hermosa has elected to implement the following voluntary limits:

- ▶ Only 3 out of 4 mechanical evaporators will operate at any given time and each mechanical evaporator will operate only 10% of the year. Compliance will be demonstrated by logging operating hours.
- ▶ The natural gas engines will operate only between 75% and 100% load. Compliance will be demonstrated by programming interlocks.
- ▶ Dozers are expected to operate only 12 hours a day. Compliance will be demonstrated by logging operating hours.
- ▶ Five (5) CAT C175 engines, each of 3000 kW, shall be subject to a voluntary limit of 500 hours/year to provide backup power for the Hermosa Project. These units would be used intermittently in a fashion similar to traditional emergency engines. They would undergo periodic readiness testing recommended by the manufacturer or South32 Hermosa’s insurer no more frequently than once a week for an hour or less and would otherwise be used only when the primary power (either line or prime generated power) to the area protected by the engine is not available or if more power is needed for a discrete, short-term project. Such projects are anticipated to be highly sporadic in nature, likely only one to three times a year for a few days. This intermittent use is not anticipated to significantly affect the emissions distribution from the Hermosa Project as a whole.

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<sup>6</sup> Per Arizona Department of Environmental Quality, *Air Dispersion Modeling Guidelines for Arizona Air Quality Permits*, Section 7.8, November 1, 2019. A “learning site” consists of all existing public schools, charter schools, and private schools at the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board.

## 4. MODEL OVERVIEW

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This section contains a description of the model selection and the meteorological data, terrain data, building wake effects, and receptors that were used in the air dispersion modeling analysis. It also describes the model refinements that were used for addressing PM<sub>10</sub>, Pb, and NO<sub>2</sub> impact.

### 4.1 Dispersion Model Selection

On November 9, 2005, the U.S. EPA promulgated the American Meteorological Society / Environmental Protection Agency Regulatory Model (AERMOD) for adoption into the Guideline on Air Quality Models (Guidelines).<sup>7</sup> AERMOD includes a state-of-the-science downwash algorithm and utilizes AERMET, a meteorological data preprocessor that utilizes current planetary boundary layer (PBL) theory to calculate the dispersion coefficients ( $\sigma_y$  and  $\sigma_z$ ).<sup>8</sup> The most current version of the AERMOD model (version 22112) was used in conducting the Hermosa Project modeling analysis. The modeling was performed using the regulatory default option, except as discussed in the sections below.

### 4.2 Meteorological Data

EPA modeling guidance allows the use of five years of off-site meteorological data or at least one year of on-site meteorological data. The EPA *Guidelines* provide a detailed discussion related to the use of “representative” meteorological data for air dispersion modeling purposes. Site specific data is preferred in the *Guidelines* as stated in Section 8.3.3.1 but must be deemed “representative” and quality assured.

On-site meteorological data at South32 Hermosa has been collected from 2018 through 2022 at the Trench meteorological station. The Trench station is located at the Hermosa Project; thus, the Trench station was the most representative for modeling purposes as it is at a similar elevation to the proposed emission sources and has similar terrain characteristics. South32 Hermosa’s on-site data from 01/01/2019 through 12/31/2021 were used in this analysis due to the exposure of the Trench Station to localized meteorology and because it meets the “representativeness” criteria and is in close proximity to the emission activities. Note that the tower siting, data collection, and QA/QC procedures were approved by ADEQ as a part of the Quality Assurance Project Plan (QAPP) submittal.<sup>9</sup> The meteorological data collected from the South32 Hermosa on-site station was consistent with EPA recommendations for on-site meteorological data instruments and completeness.

The EPA AERMOD program requires meteorological data preprocessed with the AERMET program. The most current version of the AERMET program (version 22112) was used in conducting the South32 Hermosa meteorological modeling analysis. AERMET is a three-stage meteorological data processor that reads in data observations, performs quality checks, and derives additional micrometeorological parameters required by AERMOD. In addition to the traditional wind and temperature data, AERMOD uses a combination of data observations and theory to characterize the turbulence in the atmosphere, both at the surface and aloft. AERMET meteorological data are refined for a particular analysis based on the choice of micrometeorological parameters that are linked to the land use and land cover (LULC) around the particular meteorological site. By providing raw surface and upper air station observation data to AERMET along with land use parameters,

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<sup>7</sup> Code of Federal Regulations, Title 40-Protection of the Environment, Part 51, Appendix W.

<sup>8</sup> U.S. EPA, User’s Guide for the AMS/EPA Regulatory Model-AERMOD, September 2004.

<sup>9</sup> QAPP for Trench Station submitted and approved by ADEQ on October 12, 2018

AERMOD model-ready data are created. AERMET generates both a surface file and vertical profile file to pass meteorological observations and turbulence parameters to AERMOD.

### 4.2.1 AERMET Processing

As requested by ADEQ, South32 Hermosa has reviewed the Bulk Richardson option as well as the ADJ\_U\* option for meteorological data processing.

#### 4.2.1.1 Use of Cloud Cover

South32 Hermosa set up AERMET to use the cloud cover measurements from the nearest airport weather station, i.e., Nogales Airport, to derive the atmospheric stability. South32 Hermosa applied the default cloud cover option for estimating heat flux under stable conditions. Cloud cover data was obtained from the Nogales airport NWS station located approximately 12 km WSW of the site. Given the proximity of the airport meteorological station and completeness of the cloud cover data, the non-default Bulk Richardson option outlined in 40 CFR Appendix W, 8.4.4.2, for estimating heat flux under stable conditions is not being requested as part of this permit application.

#### 4.2.1.2 Use of ADJ\_U\*

EPA allows for use of ADJ\_U\* or site-specific turbulence data while processing meteorological data in AERMET. South32 Hermosa included appropriate justification on the use of ADJ\_U\* option in AERMET as well as justification on the exclusion of partial turbulence data to avoid underprediction of impacts in the modeling protocol submitted to ADEQ on June 20<sup>th</sup>, 2022.

### 4.2.2 Data Completeness

EPA regulations require that for PSD modeling, without any filling, all meteorological parameters required for modeling be at least 90% complete, evaluated on a quarterly basis. Four consecutive quarters of data (which may or may not correspond to a single calendar year) meeting the 90% standard form a complete year. The model-ready meteorological data, which can have missing data due to gaps both in surface/on-site and upper air data, should also meet the 90% completeness requirement. Although the Hermosa Project does not involve PSD modeling, South32 Hermosa has chosen to use PSD quality data. The Trench meteorological data exceeded this standard for all parameters and quarters. Details of data completeness are included in **Table 4-1** below.

**Table 4-1. Trench Station– Meteorological Data Completeness**

<b>Year/Quarter</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>
<b>2019</b>	100.00%	100.00%	100.00%	99.23%
<b>2020</b>	99.63%	99.91%	99.86%	99.64%
<b>2021</b>	99.17%	99.95%	99.50%	99.59%

### 4.2.3 Surface Meteorological Data

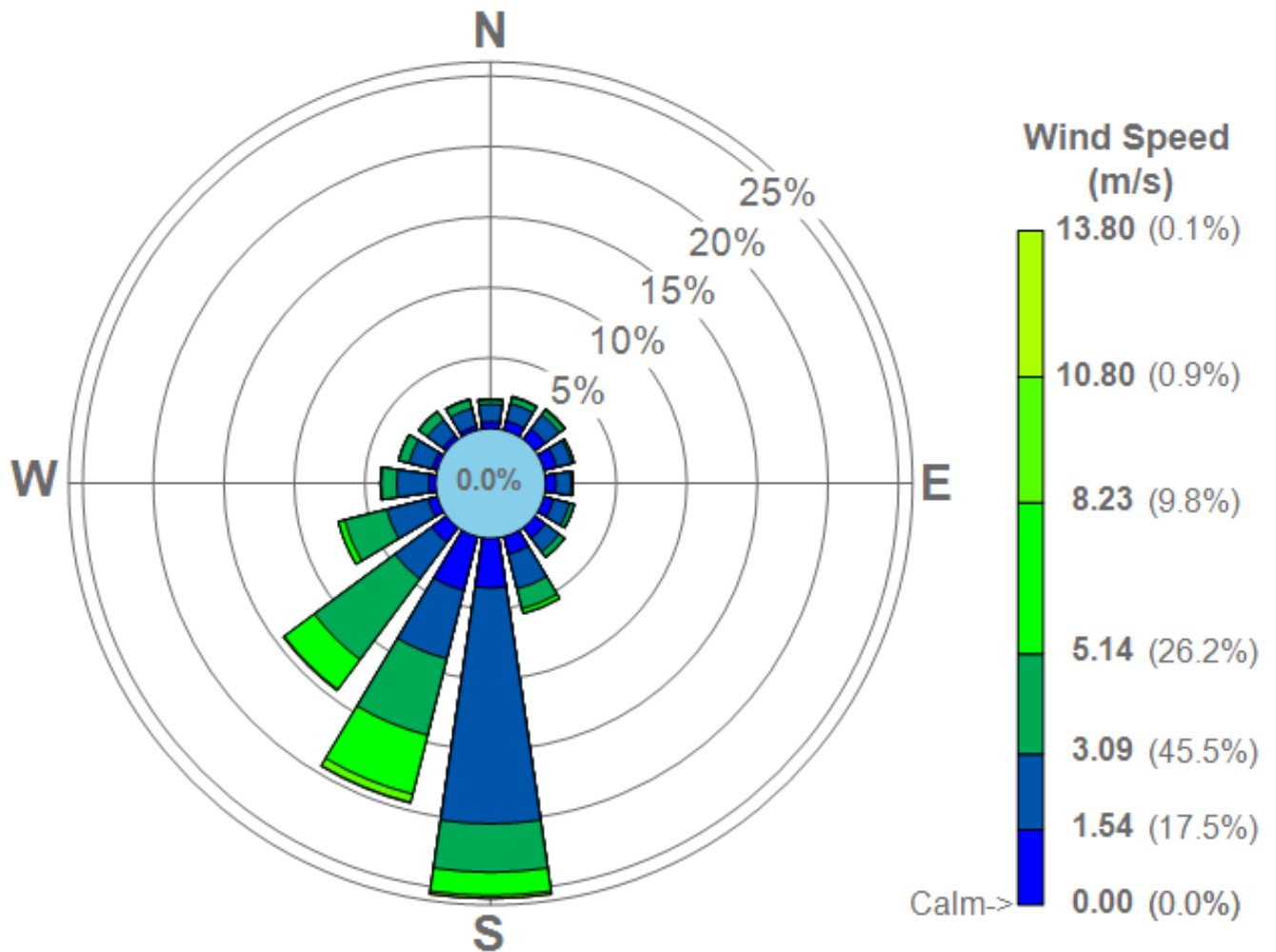
The following AERMET-relevant parameters were available from the South32 Hermosa on-site meteorological station at least once per hour:

- ▶ Wind speed and direction [at 10 meters (33 feet)];
- ▶ Standard deviation of horizontal wind direction [at 10 meters (33 feet)];

- ▶ Temperature [at 2 meters (6.6 feet) and 10 meters (33 feet)];
- ▶ Vertical temperature difference;
- ▶ Relative humidity [at 2 meters (6.6 feet)];
- ▶ Incoming solar radiation; and
- ▶ Station pressure.

**Figure 4-1** presents the surface wind rose for South32 Hermosa on-site data illustrating the frequency of prevailing winds during 2019-2021.

**Figure 4-1. Wind Rose of South32 Hermosa On-Site 2019 - 2021 Meteorological Data**



#### 4.2.4 Upper Air Data Processing

AERMET requires morning (12 GMT) sounding data from a representative upper air site to calculate mechanical mixing height and vertical potential temperature gradient. The nearest upper air sounding location to the Hermosa Project was the Tucson, AZ (TWC) station, which is located in a similar climatic region and was most representative of conditions at the Hermosa Project. As such, TWC upper air data was

used in generating the meteorological files needed for this analysis. The TWC station has a base elevation of 1205.5 meters, which sufficiently covers the Hermosa Project's lowest elevation level of 1500 meters.

#### 4.2.5 Land Use Analysis

When applying the AERMET meteorological processor to prepare the meteorological data for AERMOD, the values for three surface characteristics must be determined: surface roughness, albedo, and Bowen ratio. The surface roughness relates the height of obstacles to the wind flow and is, in principle, the height at which the mean horizontal wind speed is zero. The surface roughness length influences the surface shear stress and is an important factor in determining the magnitude of mechanical turbulence and the stability of the boundary layer. The albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. The daytime Bowen ratio, an indicator of surface moisture, is the ratio of sensible heat flux to latent heat flux and is used for determining planetary boundary layer parameters for convective conditions driven by the surface sensible heat flux.<sup>10</sup>

A land use analysis was conducted for the area surrounding the on-site meteorological station using the AERSURFACE program to determine the surface roughness, albedo, and Bowen ratio values to be input to AERMET. The most current version of the AERSURFACE program (version 20060) was used in conducting the South32 Hermosa modeling analysis. National Land Cover Data 2016 (NLCD 2016) obtained from the U.S. Geological Survey for the state of Arizona was input to AERSURFACE. The EPA AERSURFACE guidance indicates that the upwind fetch used to determine the surface roughness length should be one kilometer. Further, the guidance states that the surface roughness should be evaluated based on an inverse distance-weighted geometric mean, where the distance is the distance from the meteorological tower. Additionally, the albedo and Bowen ratio should be evaluated as the weighted average of the land use types over a 10 kilometer by 10 kilometer (6 mile by 6 mile) domain centered on the meteorological tower.<sup>11</sup> To run AERSURFACE, the user must provide NLCD 2016 data and information about the area surrounding the meteorological tower. In addition to the NLCD 2016 data for Arizona, the following inputs to AERSURFACE for the South32 Hermosa on-site meteorological station were used:

- ▶ Study radius for surface roughness (km) – 1 kilometer (0.6 miles);
- ▶ Number of sectors – 12;
- ▶ Temporal resolution – SEASONAL;
- ▶ Continuous snow cover most of the winter? – NO;
- ▶ Meteorological tower at an airport? – NO;
- ▶ Arid Region? – NO; and
- ▶ Surface Moisture? - [WET, see below]

Note that the surface moisture input is based on a comparison of annual precipitation to the 30-year climatological record of annual precipitation for Nogales, Arizona (KOLS), which is a nearby National Weather Service (NWS) station. The annual precipitation value for each year - 2019, 2020, and 2021 were separately compared to the 1991-2021 climatological record. Per U.S. EPA guidance for AERSURFACE, "Dry" surface moisture values are applied if the precipitation is below the 30th percentile of the 30-year climate record, "Wet" values are applied if the precipitation is above the 70th percentile of the 30-year climate record, and "Average" values are used if the precipitation is between the 30th and 70th percentiles. Precipitation data and details of the analysis are noted in **Table 4-2** and **Table 4-3** below.

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<sup>10</sup> U.S. Environmental Protection Agency, *AERMOD Implementation Guide*, Last Revised March 19, 2009.

<sup>11</sup> U.S. Environmental Protection Agency, *User's Guide for AERSURFACE*. EPA-454/B-08-001, 2008.

**Table 4-2. Precipitation Data for Station USW00003196 (Nogales) over 1991-2021 period**

<b>Year</b>	<b>Precipitation</b>
1991	14.69
1992	20.38
1993	18.37
1994	14.36
1995	10.55
1996	11.53
1997	14.44
1998	13.43
1999	10.84
2000	21.85
2001	13.64
2002	10.19
2003	13.12
2004	15.02
2005	12.3
2006	15.5
2007	12.85
2008	15.05
2009	9.59
2010	15.16
2011	10.97
2012	15.06
2013	14.51
2014	20.19
2015	18.61
2016	16.33
2017	12.49
2018	14.67
2019	18.34
2020	9.16
2021	14.51

**Table 4-3. Moisture Values for AERMET processing**

<b>30th percentile</b>	12.85
<b>70th percentile</b>	15.16
<b>2019</b>	Wet
<b>2020</b>	Dry
<b>2021</b>	Average

AERMET was run using the on-site, Tucson upper air, and AERSURFACE data to produce AERMOD-ready meteorological data files.

### 4.3 Terrain

The terrain elevation for each modeled receptor, building and source, was determined using the USGS National Elevation Dataset (NED). Specifically, the USGS NED 1/3 arc second (approximately 10-meter resolution) file was used. Where site grading data was available, elevation was determined using that data. For instance, site grading data was used in conjunction with NED to properly locate the TSFs, hoists, and grinding circuits to assure representative elevations.

The terrain height for each modeled receptor was calculated using the AERMOD terrain processor (AERMAP version 18018). In addition to terrain elevation, an additional parameter called the hill height scale was required for each receptor to execute AERMOD's terrain modeling algorithms. AERMOD computes the impact at a receptor as a weighted interpolation between horizontal and terrain-following states using a critical dividing streamline approach. This scheme assumes that part of the plume mass will have enough energy to ascend and traverse over a terrain feature and the remainder will impinge and traverse around a terrain feature under certain meteorological conditions. The hill height scale was computed by the AERMAP terrain preprocessor for each receptor as a measure of the one terrain feature in the modeling domain that would have the greatest effect on plume behavior at that receptor.

The hill height scale does not represent the critical dividing streamline height itself but supplies the computational algorithms with an indication of the relative relief within the modeling domain for the determination of the critical dividing streamline height for each hour of meteorological data.

According to Section 2.2.1 of the AERMOD Users Guide, the NED array boundary for AERMAP must include all terrain features that exceed a 10 percent elevation slope from any given receptor to properly calculate the hill height scale at each receptor.<sup>12</sup> The domain for the hill height analysis was set to the minimum coverage required for proper handling of elevation slope.

### 4.4 Building Wake Effects (Downwash)

The emission sources for South32 Hermosa considered in this analysis were evaluated in terms of their proximity to nearby structures. The purpose of this evaluation was to determine if stack discharge might become caught in the turbulent wakes of these structures. Wind blowing around a building creates zones of turbulence that are greater than if the building was absent. Plumes entrained in the zones of turbulence experience enhanced plume growth and restricted plume rise. AERMOD incorporates the Plume Rise Model Enhancements (PRIME) algorithms using dimensions from the EPA's Building Profile Input Program (BPIP) for estimating for plumes affected by building wakes.

The effects of downwash were limited to stacks located within a distance defined as five times "L" of a structure, where "L" is the lesser of a structure's height or direction-specific projected width. Stacks located at a distance greater than 5L are not subject to the wake effects of the structure.

The South32 Hermosa proposed site layout was reviewed to determine the buildings or structures that have stacks within 5L.

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<sup>12</sup> U.S. Environmental Protection Agency, *User's Guide for the AMS/EPA Regulatory Model – AERMOD*, Research Triangle Park, North Carolina, EPA-454/B-03-001, September, 2004.

Direction-specific building dimensions and the dominant downwash structure parameters were determined using the *BREEZE®* BPIP software, developed by Trinity Consultants, Inc. This software incorporates the algorithms of the U.S. EPA-sanctioned Building Profile Input Program with PRIME enhancement (BPIP-PRIME), version 04274.<sup>13</sup>

## 4.5 Receptor Grid

A receptor grid was developed for the air dispersion analyses to encompass a region extending up to 10 km beyond the South32 Hermosa ambient air boundary which would cover the town of Patagonia. This receptor grid was approved per email from Feng Mao with ADEQ on 04/18/2023. The receptor grid was developed to ensure that the maximum pollutant concentrations are captured by the model. Note that all receptor coordinates were established using the UTM NAD83 coordinate system. The primary receptor grids include the following<sup>14</sup>:

1. The “fenceline grid” is a discrete receptor grid with the receptors spaced at 25-meter intervals along the South32 Hermosa ambient air boundary and along Harshaw Road within the ambient air boundary.
2. The “fine grid” contains 100-meter spaced receptors extending approximately 1 kilometer from the ambient air boundary and 200-meter spaced receptors from 1 kilometer to approximately 3 kilometers from the ambient air boundary, excluding the receptors within the ambient air boundary.
3. The “medium grid” contains 400-meter spaced receptors extending approximately 5 kilometers from the ambient air boundary, excluding the receptors within the ambient air boundary and fine grids.
4. The “coarse grid” contains 800-meter spaced receptors extending up to 10 kilometers from the ambient air boundary, excluding the receptors within the ambient air boundary, fine, and medium grids.

It should be noted that the receptor grid does not extend into Mexico; the receptor grid generation follows the above except that receptors were not placed outside of the United States. The receptor grid elevations and scaling heights were calculated using AERMAP based on USGS NED 1/3 arc second data files.

South32 Hermosa has set forth a preliminary ambient air boundary (AAB) in purple for Plan I and Plan II along with discrete receptors outlined in blue in **Figure 4-2** through **Figure 4-2**. The boundary was based upon a combination of rough terrain, fencing, and security patrols that will effectively preclude entry by the general public. South32 Hermosa will provide ADEQ with a Public Access Restriction Plan prior to commencing operations which will provide additional details.

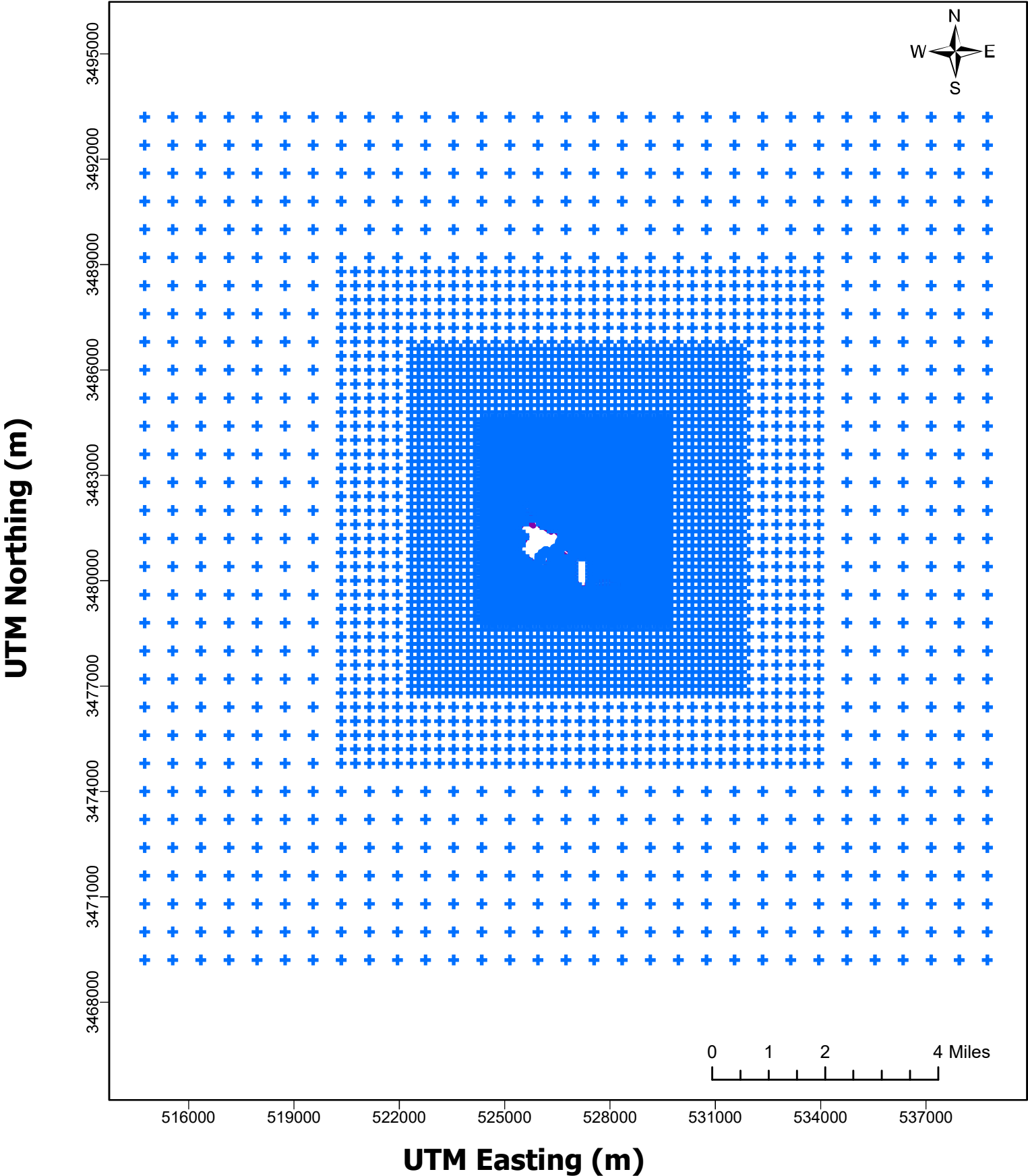
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<sup>13</sup> U.S. Environmental Protection Agency, *User’s Guide to the Building Profile Input Program*, Research Triangle Park, NC, EPA-454/R-93-038.

<sup>14</sup> Per Arizona Department of Environmental Quality, *Air Dispersion Modeling Guidelines for Arizona Air Quality Permits*, Section 3.6, September 23, 2013.



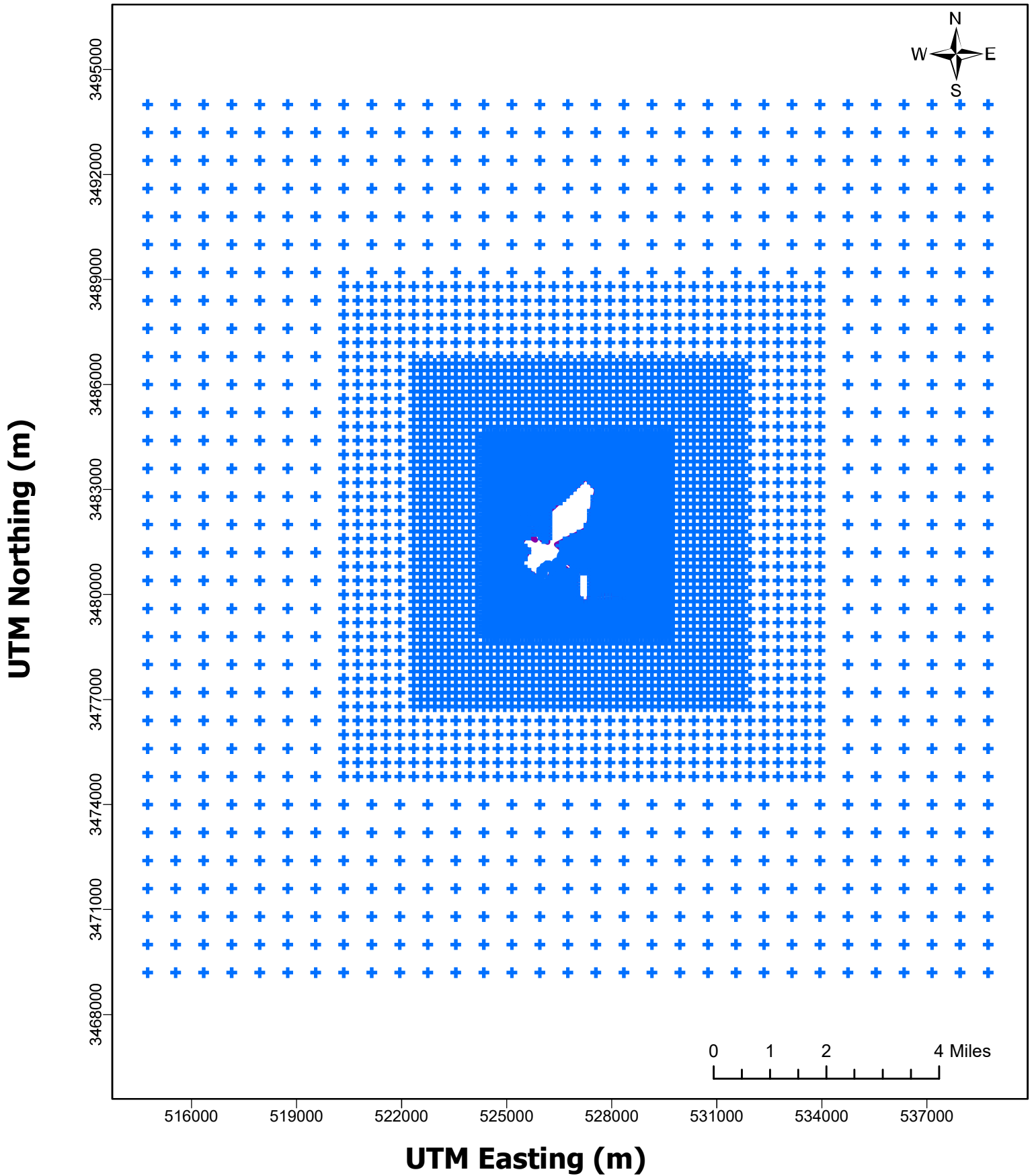
**Figure 4-2. Hermosa Project - Plan I - Receptors**



**UTM Easting (m)**  
All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983



**Figure 4-3. Hermosa Project - Plan II - Receptors**



All Coordinates shown in UTM Coordinates,  
Zone 12, NAD 1983

## 4.6 Considerations for 1-hour NO<sub>2</sub> Impacts

The following three-tiered approach for 1-hour NO<sub>2</sub> modeling is outlined in 40 CFR Part 51 Appendix W:

- ▶ Tier 1 Total Conversion - assumes full conversion of NO to NO<sub>2</sub> without any additional justification.
- ▶ Tier 2 Ambient Ratio Method 2 (ARM2) - multiplies Tier 1 result by empirically-derived NO<sub>2</sub>/NO<sub>x</sub> ratio, with a variable ambient ratio for the 1-hour NO<sub>2</sub> standard without additional justification.
- ▶ Tier 3 Plume Volume Molar Ratio Method (PVMRM)/ Ozone Limiting Method (OLM) - available as regulatory options within the AERMOD model.

In this modeling analysis, South32 Hermosa used an EPA-approved Tier 3 NO<sub>x</sub>/NO<sub>2</sub> conversion model option, which was a non-default option in AERMOD preferred for near-surface releases, to determine 1-hour NO<sub>2</sub> impacts.<sup>15</sup> The PVMRM algorithm requires the following two inputs:

- ▶ Hourly background ozone concentrations; and
- ▶ In-Stack Ratios (ISR) of NO<sub>2</sub>-to-NO<sub>x</sub> emissions.

Hourly monitor data was obtained and formatted for use with AERMOD. Any missing data was replaced using ADEQ guidelines as follows:<sup>16</sup>

- ▶ For a single missing hour, use linear interpolations to fill in the missing concentrations based on the previous and subsequent hour concentrations.
- ▶ For multiple missing hours, determine the maximum hourly ozone concentration for each month and use the monthly maximum concentration to substitute for any missing data within that month.

With regard to the ISR, EPA guidance recommends using an ISR of 0.5, but allows different ratios to be used, if justified.<sup>17</sup> For vent raises/shafts and diesel engines, South32 Hermosa used a default ISR of 0.5 and for the 2.6 MW natural gas engines, South32 Hermosa used an ISR of 0.095 based on vendor supplied stack testing data<sup>18</sup>. For the 4.4 MW natural gas engines, South32 Hermosa used an ISR of 0.35 based on data supplied by the vendor<sup>19</sup>.

## 4.7 Particle Dry Deposition

The Dry Deposition option in AERMOD calculates the fraction of the particulate emissions in the plume that are removed from the plume due to interaction with the ground surface. This option was utilized for the PM<sub>10</sub> and Pb modeling analyses. For Pb, all parameters were identical to PM<sub>10</sub>, with the exception of particle density and emissions rates where lead specific information was used.

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<sup>15</sup> Per EPA's memorandum, *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO<sub>2</sub> National Ambient Air Quality Standard*, September 30, 2014.

<sup>16</sup> Per Arizona Department of Environmental Quality, *Air Dispersion Modeling Guidelines for Arizona Air Quality Permits*, Section 7.1, September 23, 2013.

<sup>17</sup> Per EPA's memorandum, *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO<sub>2</sub> National Ambient Air Quality Standard*, September 30, 2014.

<sup>18</sup> Provided with the Class I permit application submitted to ADEQ on October 21<sup>st</sup>, 2022.

<sup>19</sup> Provided by Thomas Henkenmeier (Jenbacher), on July 27<sup>th</sup>, 2023, and submitted with the revised Class I air permit application package in September 2023.

There are two EPA methods available as part of the AERMOD Dry Deposition option – Method 1 and Method 2<sup>20</sup>. Since Method 2 is a non-regulatory option and based on feedback from ADEQ<sup>21</sup>, South32 Hermosa used Method 1 for all sources.

The use of this option in AERMOD required particle size distribution data including the following:

- ▶ Mean particle diameter;
- ▶ Mass weighted particle size distribution; and
- ▶ Particle density.

The sections below discuss the particle size and diameters used for this analysis based on AP-42 emission factors.

#### 4.7.1 Mean Particle Diameters

EPA modeling guidance does not specify default values for the particle size categories to be used in the AERMOD Dry Deposition option. As a result, the particle size categories contained in **Table 4-4** below were used in the Dry Deposition Method 1 option as these were accepted as part of the recent Rosemont Copper Project EIS (as contained in the Rosemont Copper Project, AERMOD Modeling Analysis, Appendix A, December 2012). The expected mean particle diameter of particle size ranges between 0 and 10 microns in diameter were calculated using the following formula.<sup>22</sup>

$$d = \left( \frac{d_1^3 + d_1^2 d_2 + d_1 d_2^2 + d_2^3}{4} \right)^{1/3}$$

where:

- d = mean particle diameter
- d<sub>1</sub> = low end of particle size category range
- d<sub>2</sub> = high end of particle size category range

**Table 4-4. Particle Size Distribution - Mean Particle Diameters**

Particle Size (mg)		Mean Particle Diameter (mm)
Lower	Upper	
0	3.5	2.20
3.5	5	4.29
5	7	6.06
7	8.5	7.77
8.5	10	9.27

<sup>20</sup> Per *AERMOD Deposition Algorithms – Science Document (Revised Draft)*, located at [http://www.epa.gov/scram001/7thconf/aermod/aer\\_scid.pdf](http://www.epa.gov/scram001/7thconf/aermod/aer_scid.pdf)

<sup>21</sup> Per comments on preliminary modeling protocol from ADEQ dated May 16<sup>th</sup>, 2022

<sup>22</sup> Per page 2 of "Basic Principles of Particle Size Analysis" located at [http://www.atascientific.com.au/publications/wp-content/uploads/2012/07/Basic\\_principles\\_of\\_particle\\_size\\_analysis\\_MRK034-low\\_res.pdf](http://www.atascientific.com.au/publications/wp-content/uploads/2012/07/Basic_principles_of_particle_size_analysis_MRK034-low_res.pdf)

#### 4.7.2 Particle Density

A particle density for different emission sources have been obtained from various sources noted below:

- ▶ Ore/Rock – 3.01 g/cm<sup>3</sup> (Particle Density based on South32 Hermosa engineering) for PM<sub>10</sub> modeling
- ▶ Ore/Rock – 7.60 g/cm<sup>3</sup> (Density of lead sulfide) for Pb modeling
- ▶ Tailings – Density = 2.82 g/cm<sup>3</sup> (Particle Density based on South32 Hermosa engineering) for PM<sub>10</sub> modeling. This density applies to all sources that process or contain tailings.
- ▶ Density of aggregate, shotcrete, cement = 1.44 g/cm<sup>3</sup> (Cement particle density from <https://civiljungle.com/density-of-cement-sand-and-aggregate/>)
- ▶ Density of paste backfill binder assumed to be the same as shotcrete.
- ▶ Density of lime = 3.34 g/cm<sup>3</sup> from [Density of Lime in 285 units and reference information \(aquacalc.com\)](https://aquacalc.com)
- ▶ Roads – Density of soil = 2.66 g/cm<sup>3</sup> (<https://agriinfo.in/density-of-soil-bulk-density-and-particle-density-260/>)
- ▶ Cooling Towers, Refrigeration, and Mechanical Evaporators – Density = 2.7 g/cm<sup>3</sup>. The main component of TDS is assumed to be similar for that of Calcium Carbonate. The density of Calcium Carbonate is extracted from the following source: <http://www.labchem.com/tools/msds/msds/75445.pdf>
- ▶ WTP2 Reagent Drops – Density of Sodium Sulfate = 2.70 g/cm<sup>3</sup>. Sodium sulfate has the highest throughput compared to the other two flocculants, therefore the density of sodium sulfate is used for WTP2 operations (<https://www.sigmaaldrich.com/US/en/sds/SIGALD/793531>)
- ▶ For sources where particle speciation is unknown, but a value must be set, Trinity conservatively applied default parameters provided in the EPA-Published Workbook for Plume Visual Impact Screening and Analysis, and consequently assumed 100% of the mass was particulate matter with an aerodynamic diameter of 0.3 microns or less with a particle density of 1.5 g/cm<sup>3</sup>. The small aerodynamic diameter used for these sources ensures that the effects of deposition for these sources are negligible.

#### 4.7.3 Particle Size Distribution Methodology

The distribution of PM<sub>30</sub> emissions for each emission source is derived from the emissions calculations methodology of each source as well as fitting the emissions profile into an equation.

The PM<sub>30</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> emissions rates for each emission source are fitted to a 2<sup>nd</sup> degree polynomial equation. The emission rates of particulates for each mean particle diameter category (as identified in Table 4-4) is calculated based on this polynomial equation. The percentage of emissions and cumulative emissions percentage were calculated for each mean particle diameter category. The cumulative emissions percentages provide the particle size distribution which is then used in modeling. **Appendix B** of this report presents the particle size distribution for each emission source.

Note that some emissions sources have PM<sub>10</sub> emissions equal to PM<sub>2.5</sub> emissions. The particle size distribution for the following aboveground sources assumes that all emissions are equal to PM<sub>2.5</sub>. These sources are:

- ▶ Generators; and
- ▶ Concrete batch plant operations.

Please refer to the emissions calculations provided as a part of the application for details on the emissions calculation methodology.

#### *4.7.3.1 Underground Operations*

There are five (5) major operations occurring underground at Taylor and Clark deposit that generate PM<sub>10</sub> and PM<sub>2.5</sub> emissions: drilling, blasting, crushing, material handling, and road traffic. Emissions from all underground operations escape through multiple ventilation shafts/raises for the dedicated deposits to the atmosphere. Particle size distribution is calculated for all of the underground operations. However, because all emissions route through ventilation shaft, emissions from individual underground operations are added and the particle size distribution is calculated based on a cumulative contribution of all underground activities. Therefore, the particle size distribution of the ventilation shafts/raises are based on the location (Taylor vs. Clark) and cumulative underground emissions at that location.

## 5. BACKGROUND CONCENTRATIONS

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“Background concentrations” refer to the monitored existing concentrations of a regulated pollutant in an area. A “representative” background concentration is required for each modeled pollutant and averaging period to complete the Full Impact NAAQS modeling analysis. The background concentration accounts for sources of air pollution other than those explicitly modeled. These sources may include the following:

- ▶ Natural sources;
- ▶ Nearby, non-modeled sources; and
- ▶ Unidentified sources of air pollution (e.g., long-range transport).

Typically, background concentrations are accounted for by using air quality data measured at an appropriate monitoring station. For isolated sources such as the Hermosa Project, there might be an absence of monitoring stations in the vicinity of the Hermosa Project, or the closest monitor might not be representative of Hermosa Project background concentrations. Under such occurrence, and per 40 CFR Part 51, Appendix W, South32 Hermosa can utilize a “regional site” to represent an equivalent background for each pollutant. A regional site is one that is not located near the Hermosa Project, but is impacted by similar natural, industrial, and long-range transport sources of pollutant emissions. Section 8.3 of 40 CFR Part 51, Appendix W discusses the requirements for obtaining “representative” background concentrations.

Data from EPA’s AirData website was reviewed to identify the monitor station locations in areas surrounding South32 Hermosa. The evaluation area was expanded until a “representative” monitor station could be located.

Per ADEQ guidance for determining background concentrations, the quality and age of the data collected must be considered. Therefore, the analysis utilizes the most recent three years of data, in which the background data is more than 75% complete<sup>23</sup>, for each regional site.

### 5.1 Carbon Monoxide

All active carbon monoxide monitors with complete data from 2019 to 2021 were in urban areas and the closest monitor which met the completeness criteria was conservatively chosen. The maximum concentration within the last three years, in accordance with ADEQ’s modeling guidance, was chosen as the background concentration. As such, the 22nd & Alvernon monitor in Tucson was chosen and the most representative CO background concentration is equal to the following:

- ▶ 1.8 ppm for the 1-hour standard; and
- ▶ 0.9 ppm for the 8-hour standard.

### 5.2 Nitrogen Dioxide

Per discussions with ADEQ<sup>24</sup>, Alamo Lake was chosen as a representative monitor for 1-hour NO<sub>2</sub>. ADEQ recommends using 20 µg/m<sup>3</sup> as the 1-hour background concentration for areas where local anthropogenic NO<sub>x</sub> sources are negligible. In order to evaluate whether the Hermosa Project was a site where local

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<sup>23</sup> Data completeness per 40 CFR Part 50, Appendix K, Sections 2.3(a) and (b); 40 CFR Part 50, Appendix N, Section 3.0(c); 40 CFR Part 50, Appendix R, Section 4(b) and 4(c)(i); and 40 CFR Part 50, Appendix S, Section 3.1(b) and Section 3.2(b).

<sup>24</sup> Meeting with ADEQ (Feng Mao and Mike Sonenberg) on April 6<sup>th</sup>, 2022.

anthropogenic sources are negligible, South32 Hermosa evaluated whether sources in Nogales may contribute. Based upon geography, wind roses, and a HYSPLIT analysis discussed in the modeling protocol, the air located in the Nogales area very rarely is advected to the Hermosa Project area. As the Hermosa Project is located in a rural area with no other nearby anthropogenic sources of NO<sub>x</sub>, the Alamo Lake monitor was chosen as the background monitor.

Furthermore, the hourly background concentration was used to calculate the representative annual concentration.

The most representative NO<sub>2</sub> background concentration is equal to the following:

- ▶ 20 µg/m<sup>3</sup> for the 1-hour standard; and
- ▶ 2.08 µg/m<sup>3</sup> for the annual standard.

### 5.3 Lead

There are three active lead monitors in Arizona, all of which are near specific lead emission sources thereby making them unrepresentative of non-source specific background concentrations. There are nine inactive lead monitors in Arizona, five of which were shut down prior to 1998 and one near a general aviation airport (i.e. Deer Valley airport) which would reflect lead impacts from general aviation fuel. Of the remaining two inactive monitors, one is the Phoenix Supersite which is located in a densely populated urban area and approximately 260 km from the site. The other recently inactivated lead monitor is the Children's Park Monitor located in a moderately dense urban area of Tucson. The Children's Park Monitor is approximately 100 km from the Hermosa Project site and is considered the most representative background monitor for this project. The maximum concentration within the last three years, in accordance with ADEQ's modeling guidance, should be chosen as the background concentration. However, the Children's Park Monitor terminated data collection in 2016. As such the highest 3-month rolling average background concentration value between 2013 and 2016 was utilized as representative background, per discussions with ADEQ<sup>25</sup>.

The most representative Pb background concentration was equal to the following:

- ▶ 0.005 µg/m<sup>3</sup> for the Rolling 3-month average standard.

### 5.4 Particulate Matter

40 CFR 51 Appendix W Section 8.3.2.b states the following: "The EPA recommends use of the most recent quality assured air quality monitoring data collected in the vicinity of the source to determine the background concentration for the averaging times of concern. In most cases, the EPA recommends using data from the monitor closest to and upwind of the project area. If several monitors are available, preference should be given to the monitor with characteristics that are most similar to the project area. If there are no monitors located in the vicinity of the new or modified source, a "regional site" may be used to determine background concentrations. A regional site is one that is located away from the area of interest but is impacted by similar or adequately representative sources."

The Nogales monitor was rejected because ambient PM concentrations are heavily influenced by urban and international sources that do not impact the area surrounding the Hermosa Project. Other regional

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<sup>25</sup> Per emails and discussions with ADEQ in May 2023.



monitoring sites were considered and reviewed to determine a representative monitor. Further details were provided in the modeling protocol submitted to ADEQ on June 20<sup>th</sup>, 2022.

Per discussions with ADEQ<sup>26</sup>, the IMPROVE Saguaro East monitor was chosen as a representative monitor when compared to the next nearest regional monitor - Coronado De Tucson. The most current version of AERSURFACE (v20060) was run for both IMPROVE Saguaro East and Coronado De Tucson monitors. The results show that both monitors are in locations with more than 90% area classified as rural which is in line with the Hermosa Project. The measurement scale of both monitors is regional scale which is defined as fifty (50) to one hundred (100) km, and both monitors are between fifty (50) and one hundred (100) km from the facility. Lastly, Pima County Fairgrounds and the Interstate-10 are approximately two (2) miles and four (4) miles away from the Coronado De Tucson monitor, respectively. The Pima County Fairgrounds has regular events that would lead to dust generating activities due to set up and tear down associated with each event as well as parking on unpaved parking lots. There is an RV/trailer park located in the same compound as well. Additionally, the Tucson Kart Speedway has go-karting activities on unpaved roads. This is expected to disproportionately affect the Corona De Tucson monitor. Whereas there are no high PM-emitters in the close proximity of the IMPROVE Saguaro East and the Interstate-10 is approximately eight (8) miles away from this monitor. Due to the PM emissions from nearby sources by the Coronado De Tucson monitor, South32 Hermosa decided this was not a representative monitor.

Since the 2021 data for the IMPROVE Saguaro East does not meet the 75% completeness criteria, the 2018 to 2020 values were used to determine the background concentration. The average of the 98<sup>th</sup> percentile 24-hour values over the most recent 3 years, in accordance with ADEQ's modeling guidance, was chosen as the background concentration for the PM<sub>2.5</sub> 24-hr background concentration. The average of the 2<sup>nd</sup> highest yearly values for the most recent 3 years, in accordance with ADEQ's modeling guidance, was chosen as the background concentration for the PM<sub>10</sub> 24-hr background concentration.

The most representative background concentrations were equal to the following:

- ▶ 28 µg/m<sup>3</sup> for the 24-hr PM<sub>10</sub><sup>27</sup> standard; and
- ▶ 7.2 µg/m<sup>3</sup> for the 24-hr PM<sub>2.5</sub><sup>28</sup> standard

Since the IMPROVE monitor does not collect PM<sub>2.5</sub> Annual<sup>29</sup> data, these values were calculated using the PM<sub>2.5</sub> 24-hr data and the value is 3.76 µg/m<sup>3</sup>.

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<sup>26</sup> Meeting with ADEQ (Feng Mao and Mike Sonenberg) on April 6, 2022.

<sup>27</sup> The PM<sub>10</sub> 24-hour standard is met when the three-year average of the first maximum value for each year is less than or equal to 150 µg/m<sup>3</sup>.

<sup>28</sup> The 24-hour standard is met when the three-year average of the 98<sup>th</sup> percentile value at each site is less than or equal to 35 µg/m<sup>3</sup>.

<sup>29</sup> The annual PM<sub>2.5</sub> standard is met when the three-year average of the annual mean is less than or equal to 12 µg/m<sup>3</sup>

**Figure 5-1. PM-emitting sources in the vicinity of the Corona De Tucson monitor**



## 5.5 Ozone

These are three monitors closest to the Hermosa Project:

- ▶ Saguaro National Park monitor – Neighborhood Scale monitor (range of 500 m to 4 km)
- ▶ Fairgrounds monitor – Urban Scale monitor (range of 4 km to 50 km)
- ▶ Green Valley monitor – Neighborhood Scale monitor (range of 500 m to 4 km)

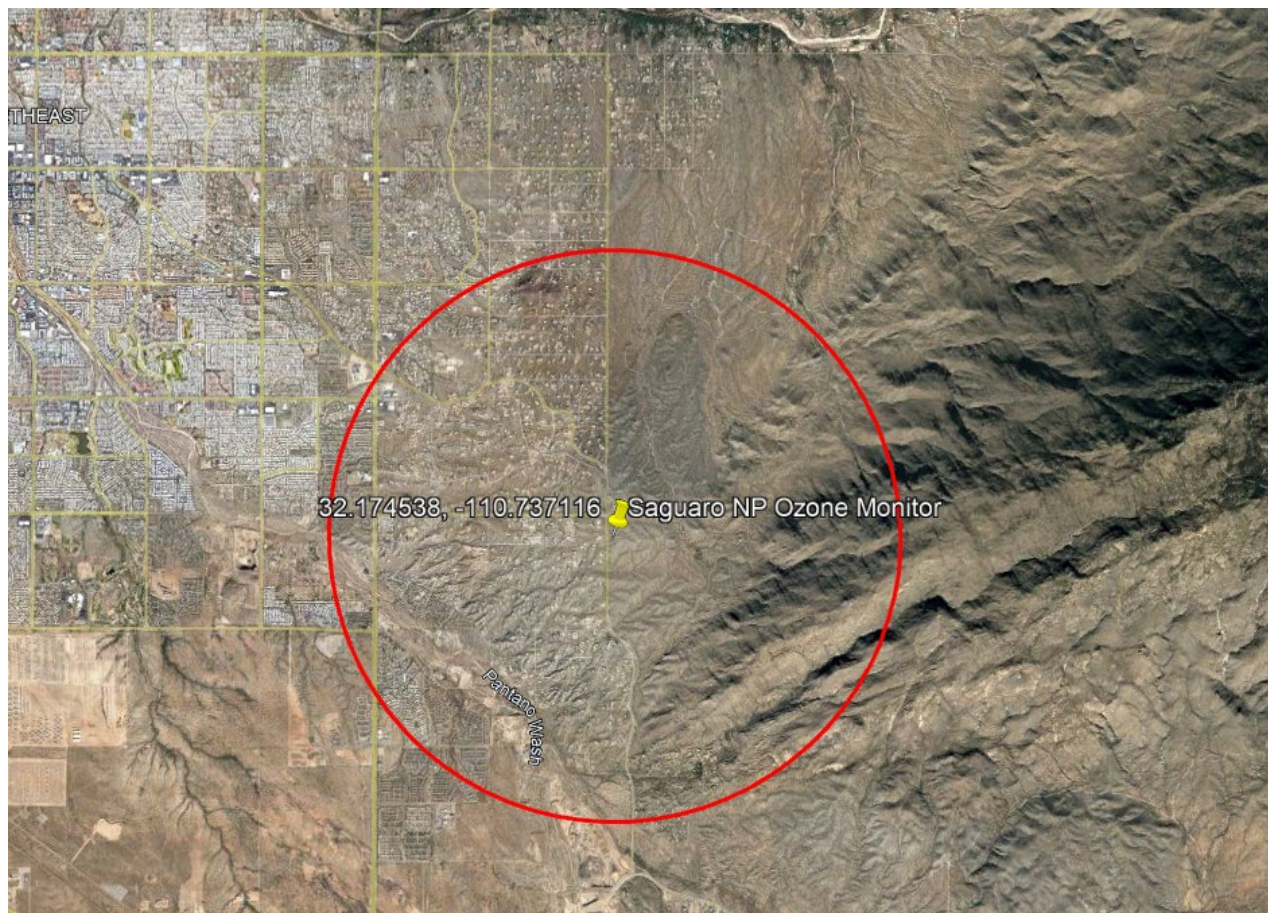
The Saguaro National Park monitor is surrounded by residential areas and the Saguaro National Park as seen **Figure 5-2**. Additionally, the monitor has a maximum range of 4 km. This monitor could be representative of the background surrounding the Hermosa Project.

The Green Valley monitor is surrounded by various mines as seen in Figure 5-2 below. As such, this monitor was not representative of the background in the vicinity of the Hermosa Project since there are no active mines located near the Hermosa Project.

The Fairgrounds monitor is representative of the Tucson metropolitan area, which is an urban area, since the range of the monitor is up to 50 km. Since no wind data is available for the Fairgrounds monitor, Tucson airport wind data can be used as a surrogate. The wind rose for the Tucson airport shows that the prevalent wind direction for the area is from the South-East. As such, this monitor provided a more conservative background since it samples an urban area at certain times but also samples rural areas due to the prevalent wind direction from the SE.

Based on discussion above, South32 Hermosa used the Fairgrounds monitor as well as the Saguaro East monitor for Tier 3 NOx air dispersion modeling since both could be considered representative. The meteorological data which was used for the dispersion modeling is from 2019 to 2021. Since QA/QC ozone data was unavailable at this time, South32 Hermosa used the data substitution methods outlined in the *ADEQ's Air Quality Modeling Guidelines for Arizona Air Quality Permits, dated November 1<sup>st</sup>, 2019*, as well as an email from ADEQ<sup>30</sup>. South32 Hermosa substituted data for each specific hour using the highest ozone concentrations collected at the same day/hour over the three years (2019 to 2021) to be conservative.

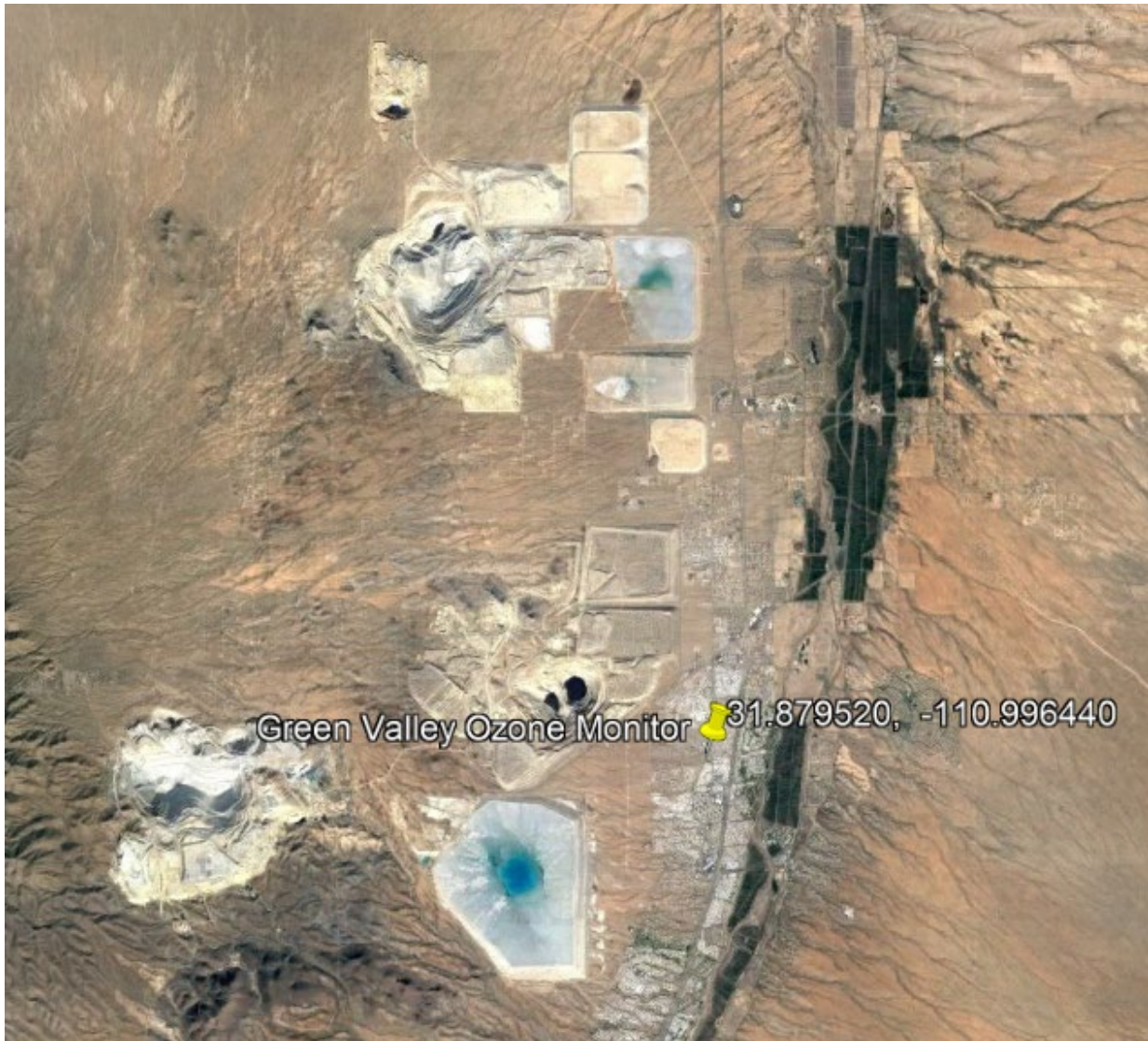
**Figure 5-2. Saguaro East National Park Monitor**



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<sup>30</sup> Email from ADEQ (Feng Mao) dated May 16, 2022.

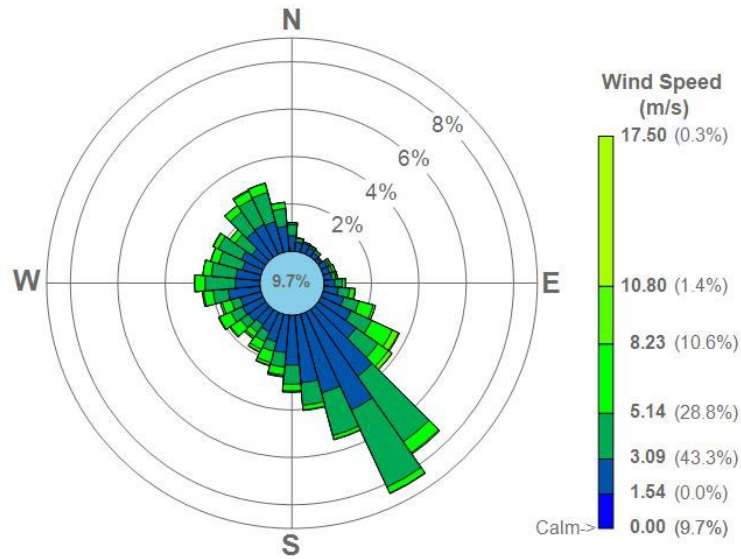
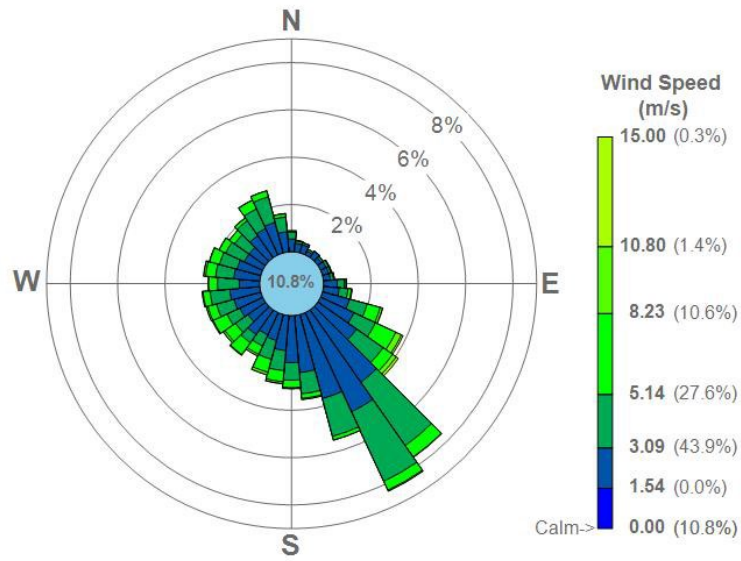
**Figure 5-3. Green Valley Monitor**

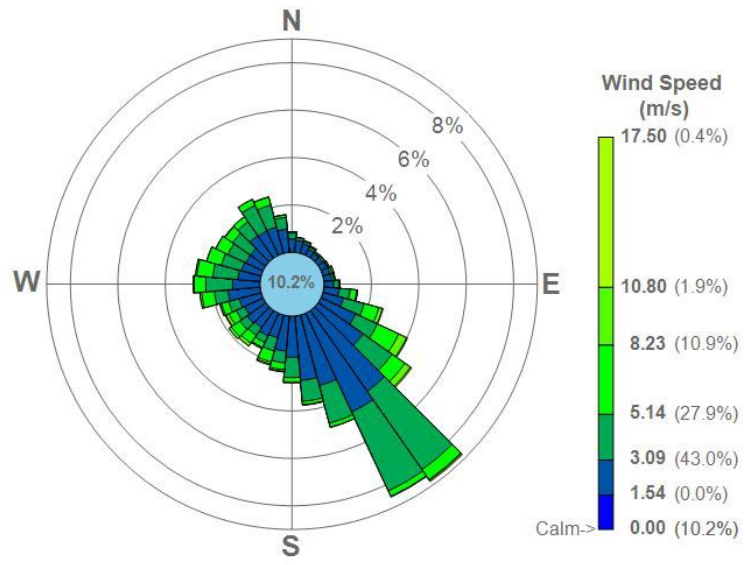


**Figure 5-4. Fairgrounds Monitor**



**Figure 5-5. Prevalent Wind Direction at Tucson International Airport (from 2019 to 2021, top to bottom)**





## 6. EMISSIONS MODELED & SOURCE CHARACTERIZATION

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The following sections discuss the Hermosa Project emission sources included in the modeling demonstration.

### 6.1 Emissions Modeled

Emissions from the various operations noted in Section 6.2 were included in this analysis. A detailed description of these operations and the emission rates used in this modeling demonstration are contained in the air permit application submittal accompanying this report.

Emissions were determined for the operating year with maximum emissions for the proposed Hermosa Project. Note that this is a very conservative assumption since it is highly unlikely that all these activities will be performed in the same operating year during life of mine. Daily (24-hour) predicted model concentrations were based upon daily emission rates calculated using either the daily activity rates for the maximum emission or maximum equipment design rates. Short-term predicted model concentrations (1-hour and 8-hour) were based upon hourly emission rates calculated using either maximum hourly activity rates or maximum equipment design rates. Sources are classified as fugitive or point based on their nature, not whether they are above or below ground. For example, blasting emissions were classified as fugitive. Both fugitive and non-fugitive emissions were included in the dispersion modeling.

Motor vehicle and mobile source crankcase emissions were excluded from the emissions modeled for stationary source permitting purposes, consistent with Arizona Revised Statutes (A.R.S.) §49-402(A)(7) and A.A.C. R18-2-101(146)(a)(i). Emissions caused by motor vehicle and mobile sources (e.g., entrained dust) were included in the emissions modeled.

### 6.2 Source Characterization

The following sections provide the details associated with characterizing the Hermosa Project emission sources into various AERMOD model source representations. Please note that model parameters were assumed when data was unavailable based on typical configurations for similar sources.

#### 6.2.1 Point Sources

All coarse ore dust collector exhausts, cooling towers, vent raises/shafts, and natural gas engines were modeled as individual point sources with the appropriate stack parameters (i.e., stack height, diameter, exit velocity, and exit temperature).

The following are additional considerations associated with the point sources:

- ▶ The coarse ore dust collectors exhaust at ambient temperature and thus were modeled at 0 Kelvin (-459.67°F), which flags the model to use the hourly ambient temperature from the meteorological data as the exit temperature. Dust collector exhaust velocities were based on the volumetric flowrate of the dust collector and heights were based on the location of the dust collector. The diameters of the dust collectors were assumed based on typical configurations for similar sources.
- ▶ The cooling tower stack parameters were based on the characteristics of the cooling tower fan. The release height was based on the height of the cooling tower cell, the diameter was based on the area cross-section for the cooling tower exhaust fan, and the vertical velocity was determined by the fan flow



rate.<sup>31</sup> The cooling towers exhaust at ambient temperature and thus were modeled at 0 Kelvin (-459.67 °F). All model parameters were provided by South32 Hermosa engineering.

- ▶ The stack modeling parameters for the natural gas and diesel engines were determined by identifying the height, stack temperature, exhaust diameter, and exhaust velocity of each source from specification sheets, design documents or stack testing reports, and where necessary, common parameters may be used for similar engines. Note that the initial loading analysis was used to determine the conservative model parameters for each pollutant for the 2.6MW natural gas engines which are the primary power source used in the Base Case. Due to the addition of an alternate power generation scenario, an additional loading analysis was completed for the alternative primary power source scenario for the use of twenty-seven (27) 4.4 MW natural gas engines. Diesel generators are task oriented and were modeled at 100% load when operating.
- ▶ Ventilation shafts/raises were modeled assuming full production is achieved. The vent raises/shafts were modeled at a fixed temperature as provided by South32 Hermosa engineering. All other model parameters (stack height, stack diameter, and volumetric flow rate) were also provided by South32 Hermosa engineering. The emissions from the ventilation shafts/raises included underground emissions associated with blasting, drilling, material transfer, hauling/underground traffic, and underground crushing.

#### 6.2.1.1 Loading Analysis for Natural Gas Engines

South32 Hermosa may produce power onsite using multiple generators powered by natural gas engines. The generators are expected to operate at 100% load with a small fraction of the generators operating at 75% load for short periods. In order to capture the worst-case short-term impacts in the dispersion models, a load analysis on the generators was performed. Model runs with the generators operating at 75% and 100% loads were performed. Each pollutant was run for both the Plan I and Plan II operating scenarios. Modeling parameter for each loading scenario were taken from design drawings and actual source testing results. **Table 6-1** provides the stack parameters and emission rates used in the load analysis.

**Table 6-1. Load Analysis Stack Parameters – 2.6MW Engines**

Load	Stack Height (m)	Stack Diameter (m)	Stack Temperature (K)	Stack Velocity (m/s)	Emission Rate (g/s)		
					PM <sub>2.5</sub>	NO <sub>2</sub>	CO
75%	5.58	0.8128	761.02	4.677	1.32E-02	3.13E-02	1.12E-02
100%	5.58	0.8128	742.87	6.0259	1.59E-03	6.25E-02	1.04E-02

For CO, and PM<sub>2.5</sub>, the 75% loading parameters are used for the modeling, while for NO<sub>2</sub>, the 100% loading parameters are used in modeling. In addition, PM<sub>10</sub> and Pb also used 75% loading parameters to match the PM<sub>2.5</sub> loading analysis.

**Table 6-2. Load Analysis Stack Parameters – 4.4MW Engines**

Load	Stack Height (m)	Stack Diameter (m)	Stack Temperature (K)	Stack Velocity (m/s)	Emission Rate (g/s)		
					PM <sub>2.5</sub> /PM <sub>10</sub>	NO <sub>2</sub>	CO

<sup>31</sup> Per Nebraska Modeling Guidelines for Permits, 06-188, September 2005.

75%	10.9474	0.6985001	675.9279	9.013326	0.031030	0.036187	0.058206
100%	10.9474	0.6985001	642.5944	11.9944	0.040628	0.046463	0.077608

For all pollutants, the 100% loading parameters were used for modeling. In addition, PM<sub>10</sub> and Pb also used 100% loading parameters to match the PM<sub>2.5</sub> loading analysis.

## 6.2.2 Horizontal Sources

Dust Collection Systems associated with lime silos, paste plant binder silos and module mixers, as well as concrete batch plant cement silos were conservatively modeled as horizontal sources exhausting at ambient temperatures. The model parameters (stack height, stack diameter, and volumetric flow rate) were assumed based on typical configurations for similar sources.

## 6.2.3 Volume Sources

Due to the nature of the Hermosa Project's operations, some of the sources were modeled as volume sources as described below.

### 6.2.3.1 Volume Sources - Roads

Most of the roads were modeled as a series of adjacent volume sources. As part of allocating the calculated emissions for the various trucks traveling on the plant roads to the appropriate locations, the roads were divided up into segments. Each road segment represents a stretch of road that can be traveled on for hauling at least one type of material. There are some road segments that were traveled on by trucks hauling multiple materials (e.g., most of the trucks which come in through the Hermosa Project entrance roads i.e. Harshaw Road and Flux Canyon Roads). A weighted average vehicle height was computed for each segment based on the number of trips of each vehicle traveling on the road segments.

Based on the number of volume sources needed to cover a specific road segment and the total emissions for the trucks traveling on the segment, the emissions were spread out across the segments. Source parameters were determined following the eight steps contained in ADEQ modeling guideline.<sup>32</sup>

- ▶ Step 1: Adjusted width of road = road width (variable) + 6 meters
- ▶ Step 2: Number of volume source N = road length / adjusted road width
- ▶ Step 3: Height of volume = 1.7 x average vehicle height
- ▶ Step 4: Initial horizontal sigma ( $\sigma_{y0}$ ) = adjusted road width / 2.15
- ▶ Step 5: Initial vertical sigma ( $\sigma_{z0}$ ) = volume height / 2.15
- ▶ Step 6: Release height = volume height / 2
- ▶ Step 7: Emission rate per volume source = total emission rate / number of volume source
- ▶ Step 8: Determine UTM coordinate for release point.

In an event that road volume sources are in the vicinity of fenceline receptors, the road emissions were modeled as area sources to avoid volume source exclusion zones and more accurately estimate impacts as close as possible to the source.

<sup>32</sup> ADEQ, *Air Quality Modeling Guidelines for Arizona Air Quality Permits*, Section 3.3.5, November 1, 2019.

### 6.2.3.2 Volume Sources – Loading and Unloading/Material Handling

Emissions were modeled for the unloading and loading for various operations. The release height was determined by dividing the source vertical dimension by 2. For surface-based material handling operations, initial vertical dimension was calculated by dividing the height of the source (i.e. stockpile) by 2.15, and for elevated sources the difference between the height of the drop point (i.e. conveyor) and the height of the screen/bed/belt/bin where the material is dropped to, divided by 4.3. Additionally, the initial lateral dimension was determined to be the width of the source (i.e. truck bed, conveyor belt, etc.) divided by 4.3.

### 6.2.3.3 Volume Sources – Dozers

Emissions from materials handling by dozers were modeled as volume source types. The release height was set to ½ the blade height and the width of the volume source was set to the blade width. The dozer source base elevations were set equal to the worst-case pile elevations described in the area source section below.

A sensitivity study was performed to identify the worst-case dozer volume source locations by running a model with six to seven source locations around the perimeter of the piles. The source locations with the highest impacts were used in the site wide modeling. Table 6-2 and Table 6-3 show the model results and the worst case location for each dozer.

For modeling the 3-month rolling average lead standard and PM<sub>2.5</sub> annual, lateral dimensions were updated to be representative of the larger areas which will be operated on during the course of a month, and locations for dozers are slightly adjusted from 24-hr modeling to ensure all larger volume sources are inside the ambient air boundary. Dozers are still placed in the same general locations as 24-hr modeling for PM<sub>10</sub>/PM<sub>2.5</sub>.

**Table 6-3. Dozer Location Sensitivity Results for Plan I**

Source	Concentrations							Worst Case Location	
	Locatio n 1	Locatio n 2	Locatio n 3	Locatio n 4	Locatio n 5	Locatio n 6	Locatio n 7	UTMx (m)	UTMy (m)
<b>DOZHR</b>	65.30	1355.2 8	56.18	189.71	103.33	1254.6 1	2682.0 5	526976. 70	3480295. 90
<b>DOZTSF _3</b>	44.73	249.40	167.14	534.56	153.61	31.26	31.15	526166. 60	3481495. 50
<b>DOZWR S</b>	117.35	294.71	341.56	166.71	62.05	240.88		525494. 30	3481050. 70
<b>DOZERS</b>	29.53	41.46	40.39	27.36	60.82	41.57		526121. 00	3480791. 10

**Table 6-4. Dozer Location Sensitivity Results for Plan II**

Source	Concentrations							Worst Case Location	
	Locatio n 1	Locatio n 2	Locatio n 3	Locatio n 4	Locatio n 5	Locatio n 6	Locatio n 7	UTMx (m)	UTMy (m)
<b>DOZTSF 1</b>	18.86	37.30	187.87	132.42	60.55	71.35		527123. 80	3481779. 30
<b>DOZTSF 2</b>	18.84	39.15	204.12	138.70	58.78	67.61		527123. 80	3481779. 30

<b>DOZHR</b>	60.75	1287.8 6	52.32	172.24	95.10	1194.2 1	2546.4 6	526976. 70	3480295. 90
<b>DOZTSF 3</b>	40.96	233.96	155.47	482.02	79.81	28.88	28.40	526166. 00	3481495. 80
<b>DOZWR S</b>	107.83	267.63	325.14	154.42	56.39	221.30		525493. 80	3481049. 90
<b>DOZERS</b>	25.85	37.35	35.68	23.93	55.96	38.05		526121. 00	3480791. 10

#### 6.2.3.4 Volume Sources – Concrete Batch Plants

Fugitive emissions from the concrete batch plants (CBP) and crusher were modeled as volume sources. The release height and other parameters were based on common CBP parameters within the industry.

#### 6.2.3.5 Volume Sources – Mechanical Evaporators

Emissions from evaporators used to spray and evaporate water were modeled as volume sources based on vendor provided estimates for the release height and vertical/lateral dimensions.

#### 6.2.3.6 Volume Sources – Pebble Crusher

The pebble crusher is located adjacent to the coarse ore silos, i.e. adjacent to a building, and modeled as a volume source. The release height is height of building divided by 2 while the initial vertical dimension is height of building divided by 2.15.<sup>33</sup> The lateral dimension was estimated based on approximate dimensions of equipment layout area divided by 4.3.

#### 6.2.3.7 Volume Sources –Rock Breaker

The rock breaker is modeled as a volume source not on or adjacent to a building. The initial release height is the height of hopper to the Clark crusher divided by 2. The initial vertical dimension is height of hopper divided by 4.3 and initial lateral dimension is width of hopper divided by 4.3.<sup>34</sup>

### 6.2.4 Area Sources

The Tailings Storage Facilities, Rock Stockpiles, and Other Stockpiles have been modeled as area sources. These piles grow to large areas but only a small portion of the pile is active at one time. Once the inactive areas become stabilized, emissions from the stabilized inactive areas are negligible. However, South32 Hermosa conservatively modeled the entire pile areas. The height of each tailings storage facility and rock stockpile is subject to change over the lifetime of the mine. The Other stockpile heights were estimated to vary between 10 and 20 feet in height. For modeling purposes, a 20-foot maximum height was assumed for stockpiles corresponding to a 10 foot release height based on feedback from South32. Tailings and rock piles used a worst-case base elevation for modeling purposes as these piles will grow and rise in height over time. A working height of 30 feet was assumed for these piles based on feedback from South32. A corresponding release height of 15 feet was used for modeling.

<sup>33</sup> [AERMOD Users Guide \(epa.gov\)](http://www.epa.gov/aermod)

<sup>34</sup> Ibid.

South32 Hermosa performed a sensitivity model run with various base elevations for the piles representing the pile height changes over time. The analysis was performed for averaging periods consistent with particulate and lead NAAQS averaging periods (hourly, monthly, daily, and annual) using a normalized 1 g/s emission rate for each pile. To accurately and conservatively estimate the impacts from this source, the elevation height that results in the highest impacts was used for subsequent modeling with all other Hermosa Project sources. Table 6-4 and Table 6-5 show the results from the sensitivity analysis.

**Table 6-5. Pile Elevation Sensitivity Results for Plan I**

Averaging Period	Source ID	Elevation 1	Elevation 2	Elevation 3	Elevation 4	Worst Case Elevation (m)
<b>24-hr</b>	TSF_3	26.25	35.79	38.83	33.87	1584.96
	WRS	7.96	86.30	89.13	87.59	1595.12
	ERS	3.10	35.85	28.40	28.40	1581.91
	HRS	5.34	48.15	78.31	77.48	1623.06
<b>Annual</b>	TSF_3	10.21	11.90	13.55	12.39	1584.96
	WRS	0.61	15.87	15.45	15.79	1590.04
	ERS	0.21	3.42	3.35	3.35	1581.91
	HRS	0.38	13.30	12.57	11.65	1600.20
<b>Monthly</b>	TSF_3	12.61	14.48	16.27	14.72	1584.96
	WRS	1.67	21.27	20.66	21.15	1590.04
	ERS	0.52	5.29	5.09	5.09	1581.91
	HRS	1.10	18.80	17.65	16.32	1600.20

**Table 6-6. Pile Elevation Sensitivity Results for Plan II**

Averaging Period	Source ID	Elevation 1	Elevation 2	Elevation 3	Elevation 4	Worst Case Elevation (m)
<b>24-hr</b>	TSF_3	26.54	34.00	38.71	33.81	1584.96
	WRS	7.99	85.74	89.73	87.22	1595.12
	ERS	2.72	35.95	28.43	28.43	1581.91
	HRS	5.34	48.15	78.31	77.48	1623.06
	TSF2	1.66	13.55	11.84	11.74	1534.16
<b>Annual</b>	TSF_3	10.30	12.29	13.54	12.38	1584.96
	WRS	0.61	15.97	15.55	15.89	1590.04
	ERS	0.20	3.28	3.19	3.19	1581.91
	HRS	0.38	13.30	12.57	11.65	1600.20

	TSF2	0.09	2.40	2.22	2.03	1534.16
<b>Monthly</b>	TSF_3	12.65	15.23	16.27	14.74	1584.96
	WRS	1.68	21.41	20.81	21.30	1590.04
	ERS	0.50	4.63	4.58	4.58	1581.91
	HRS	1.10	18.80	17.65	16.32	1600.20
	TSF2	0.23	3.13	2.88	2.64	1534.16

AERMOD includes six different categories reflecting six ranges for wind speeds. The user is able to enter a “variable emission rate factor” for each of the six wind speed categories that weights the emissions for hours with wind speeds in the different categories. Because wind speeds below 5.14 m/s are not high enough to entrain particulates, emissions were set to zero for wind speeds below 5.14 m/s, consistent with previous discussions with ADEQ.

The release height for the wind erosion of these stockpiles was half the stockpile height<sup>35</sup>. The initial vertical dimension of the stockpile was the height of the stockpile divided by 4.3<sup>36</sup>.

#### *6.2.4.1 Area Sources – Road Segments Near Receptors*

Road segments that were within the exclusion zone of a defined volume source were modeled as an area source.<sup>37</sup> Road area sources were limited to a 10:1 length to width ratio so in some cases multiple area sources were defined to cover a road segment. Emissions for the area source segment were the sum of the volume source segment emissions within the area source. Per ADEQ recommendation, receptors within 1 meter of an area source were relocated to a distance of 1 meter from the area source.<sup>38</sup>

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<sup>35</sup> National Stone, Sand & Gravel Association Guidance – Modeling Fugitive Dust Sources with AERMOD, January 2007

<sup>36</sup> Ibid

<sup>37</sup> Volume source exclusion zone is  $((2.15 \times \text{sigma-y}) + 1 \text{ meter})$ .

<sup>38</sup> Email from Feng Mao of ADEQ on 9/7/2022.

## 7. OZONE IMPACT ANALYSIS

Section 7.6 of the ADEQ dispersion modeling guidelines provides guidance on modeling single-source impacts of ozone. The first tool approach presented by ADEQ involves the use of technically credible relationships between precursor emission and a source’s secondary impacts based on appropriate modeling systems. The first tool provided compares the Hermosa Project emission rates of NO<sub>x</sub> and VOCs to the emission rates that are expected to cause an increase in ozone concentration of 1 part per billion (ppb). 1 ppb represents the SIL for ozone.

To address comments received from ADEQ, VOC emission calculations for the natural gas engines were revised to incorporate an updated emission factor for VOCs. VOC emission factors for these engines are obtained from stack testing results, and to ensure that all VOCs were captured accurately, emission factors were updated to include the total emissions measured from specific VOC tests including formaldehyde and acetaldehyde. The project emissions presented in table 7-1 are an updated value which includes the increase of VOC emissions due to this change in VOC emission factors.

EPA modeled three hypothetical single source locations in Arizona for three different emission rates and two different stack heights. The hypothetical source in La Paz County, Arizona had the lowest single source NO<sub>x</sub> and VOC emission which would cause a 1 ppb increase in ozone. The most conservative emissions, and the Hermosa Project emissions are compared in **Table 7-1**.

**Table 7-1. MERPs Values for La Paz County**

MERPs Source Location		Most Conservative Illustrative MERP Values (tpy)		Proposed Hermosa Project Emissions (tpy)		Exceed MERPs?
Latitude/Longitude	County	VOC	NO <sub>x</sub>	VOC	NO <sub>x</sub>	
33.3996, -113.4082	La Paz	4,553	214	95.94	203.61	No

**Source 17** shows that the proposed emissions are below the most conservative modeled emission rates for precursors (MERP) VOC and NO<sub>x</sub> emission rates and therefore the Hermosa Project will not contribute to an increase in ozone above the 1 ppb SIL level.

Pursuant to the EPA July 2022 guidance<sup>39</sup>, a proposed project with an increase of NO<sub>x</sub> and/or VOC emissions in excess of 40 tpy triggers an ozone air impact analysis.

The O<sub>3</sub> impacts for the source impact assessment were calculated as the sum of the ratio of precursor emissions to the MERPs. If the sum of the ratios is less than 1, then the O<sub>3</sub> impacts are below the O<sub>3</sub> SIL and no cumulative analysis is necessary.

<sup>39</sup> Guidance for Ozone and Fine Particulate Matter Permit Modeling, dated July 29, 2022  
<https://www.epa.gov/system/files/documents/2022-08/2022%20Guidance%20O3%20and%20Fine%20PM%20Modeling.pdf>

South32 Hermosa proposes Source 17 in La Paz County as the representative MERP source. The ratio of the post-project PTE<sup>40</sup> to the MERP value is evaluated using equation given below.

$$\text{Secondary Ozone Impact} = \left( \frac{\text{NO}_x \text{ Emissions}}{\text{NO}_x \text{ MERP}} + \frac{\text{VOC Emissions}}{\text{VOC MERP}} \right) < 1$$

For Source 17:  $\left( \frac{203.61}{214} + \frac{95.94}{4553} \right) = 0.9725 < 1$

As shown in the calculation above, South32 Hermosa will not contribute to an increase in ozone above 1 ppb SIL Level and no cumulative analysis is required.

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<sup>40</sup> Post-project PTE is used conservatively.



## 8. MODELING RESULTS

A Full Impact Analysis was conducted for a 10 km receptor grid<sup>41</sup>. Results of the Full Impact Analysis are presented in **Table 8-1**. As shown, the Hermosa Project will not interfere with attainment or maintenance of the NAAQS. Details of the secondary PM<sub>2.5</sub> assessment is provided in Section 8.1.

**Table 8-1. NAAQS Full Impact Analysis Results – 2.6MW Engines**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeled Concentration<sup>1</sup> (µg/m<sup>3</sup>)</b>	<b>Secondary Formation Concentration (µg/m<sup>3</sup>)</b>	<b>Background Concentration<sup>2</sup> (µg/m<sup>3</sup>)</b>	<b>Total Concentration<sup>3</sup> (µg/m<sup>3</sup>)</b>	<b>NAAQS (µg/m<sup>3</sup>)</b>	<b>Exceeds NAAQS? (Yes/No)</b>	<b>Form of the Standard 5,6,7</b>
PM <sub>10</sub>	24-hour	Plan I – 106.14 Plan II – 104.16	-	28.0	Plan I – 134.14 Plan II – 132.16	150	No	Not to be exceeded more than once per year on average
PM <sub>2.5</sub> <sup>4</sup>	Annual	Plan I – 4.70 Plan II – 5.03	0.00021	3.76	Plan I – 8.46 Plan II – 8.79	12	No	Annual mean
	24-hour	Plan I – 16.28 Plan II – 16.70	0.020	7.2	Plan I – 23.50 Plan II – 23.92	35	No	98th percentile, averaged over 5 years
Pb	3-months rolling	Plan I – 0.090 Plan II – 0.085	-	0.005	Plan I – 0.095 Plan II – 0.090	0.15	No	Maximum arithmetic mean

<sup>41</sup> Per email from Feng Mao, ADEQ, on 04/18/2023.

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeled Concentration<sup>1</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Secondary Formation Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Background Concentration<sup>2</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Total Concentration<sup>3</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>NAAQS (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Exceeds NAAQS? (Yes/No)</b>	<b>Form of the Standard 5,6,7</b>
CO	1-hour	Plan I – 11,017 Plan II – 10,900	-	2,058	Plan I – 13,075 Plan II – 12,958	40,000	No	Not to be exceeded more than once per year on average
	8-hour	Plan I – 2,428 Plan II – 2,423	-	1,000	Plan I – 3,428 Plan II – 3,423	10,000	No	Not to be exceeded more than once per year on average
NO <sub>2</sub>	1-hour	Plan I – 138 Plan II – 125	-	20.0	Plan I – 158 Plan II – 145	188	No	98th percentile of 1-hour daily maximum concentrations, averaged over 5 years
	Annual	Plan I – 10.41 Plan II – 10.40	-	2.08	Plan I – 12.49 Plan II – 12.48	100	No	Annual Mean

<sup>1</sup> Modeled concentration includes emission sources at the Hermosa Project. The concentration is reported as the highest receptor in the form of the standard.

<sup>2</sup> Refer to Section 6 for a detailed analysis concerning the background concentration.

<sup>3</sup> The total concentration for comparison to the NAAQS is the modeled plus the background concentration.

<sup>4</sup> PM<sub>2.5</sub> modeled concentration includes secondary PM<sub>2.5</sub> impacts.

<sup>5</sup> Guideline on Air Quality Models; Final Rule, 40 CFR Part 51, Appendix W, January 17, 2017.

<sup>6</sup> EPA Memo, Applicability of Appendix W Modeling Guidance for the 1-hour NO<sub>2</sub> National Ambient Air Quality Standard, June 28, 2010.

<sup>7</sup> EPA Memo, Modeling Procedures for Demonstrating Compliance with PM<sub>2.5</sub> NAAQS, March 23, 2010.

**Table 8-2. NAAQS Full Impact Analysis Results – 4.4MW Engines**

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeled Concentration<sup>1</sup> (µg/m<sup>3</sup>)</b>	<b>Secondary Formation Concentration (µg/m<sup>3</sup>)</b>	<b>Background Concentration<sup>2</sup> (µg/m<sup>3</sup>)</b>	<b>Total Concentration<sup>3</sup> (µg/m<sup>3</sup>)</b>	<b>NAAQS (µg/m<sup>3</sup>)</b>	<b>Exceeds NAAQS? (Yes/No)</b>	<b>Form of the Standard <small>5,6,7</small></b>
PM <sub>10</sub>	24-hour	Plan I – 106.01 Plan II – 104.12	-	28.0	Plan I – 134.01 Plan II – 132.12	150	No	Not to be exceeded more than once per year on average
PM <sub>2.5</sub> <sup>4</sup>	Annual	Plan I – 4.67 Plan II – 5.01	0.00021	3.76	Plan I – 8.43 Plan II – 8.77	12	No	Annual mean
	24-hour	Plan I – 15.44 Plan II – 15.40	0.020	7.2	Plan I – 22.66 Plan II – 22.62	35	No	98th percentile, averaged over 5 years
CO	1-hour	Plan I – 11,022 Plan II – 10,900	-	2,058	Plan I – 13,080 Plan II – 12,958	40,000	No	Not to be exceeded more than once per year on average
	8-hour	Plan I – 2,430 Plan II – 2,425	-	1,000	Plan I – 3,430 Plan II – 3,425	10,000	No	Not to be exceeded more than once per year on average

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeled Concentration<sup>1</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Secondary Formation Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Background Concentration<sup>2</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Total Concentration<sup>3</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>NAAQS (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Exceeds NAAQS? (Yes/No)</b>	<b>Form of the Standard <sub>5,6,7</sub></b>
NO <sub>2</sub>	1-hour	Plan I – 101 Plan II – 102	-	20.0	Plan I – 121 Plan II – 122	188	No	98th percentile of 1-hour daily maximum concentrations, averaged over 5 years
	Annual	Plan I – 4.32 Plan II – 4.32	-	2.08	Plan I – 6.40 Plan II – 6.40	100	No	Annual Mean

## 8.1 Modeled Impact Contour Plots

Appendix C contains contour plots for each model run outlined in Table 8-1 and Table 8-2. These contour plots, created utilizing *BREEZE®* 3D Analyst software, visually represent the anticipated dispersion of pollutants for each pollutant and the associated averaging periods modeled. These plots are derived from data obtained during the model runs, and the maximum impact highlighted excludes background concentrations or secondary formation concentrations.

The color scheme used to depict the contours is automatically generated by the program, reflecting the spectrum of modeled impacts. It's important to note that this color representation does not signify specific concentration limits; rather, it serves as a visual representation based on the range of modeled impacts.

## 8.2 Secondary PM<sub>2.5</sub> Assessment

Precursor pollutants for PM<sub>2.5</sub> (i.e., NO<sub>x</sub> and SO<sub>2</sub>) can undergo photochemical reactions with gases in the atmosphere, resulting in the formation of secondary PM<sub>2.5</sub> downwind of an emission source, which can add to concentrations resulting from direct (or primary) emissions of PM<sub>2.5</sub>. Two of the largest constituents of secondary PM<sub>2.5</sub> in the U.S. are sulphates (SO<sub>4</sub><sup>2-</sup>) and nitrates (NO<sub>3</sub><sup>-</sup>), both of which are formed from their respective precursor pollutants (i.e., SO<sub>2</sub> for SO<sub>4</sub><sup>2-</sup>, NO<sub>x</sub> for NO<sub>3</sub><sup>-</sup>).

Pursuant to the EPA July 2022 guidance<sup>42</sup>, a proposed project with an increase of NO<sub>x</sub> and/or SO<sub>2</sub> emissions in excess of 40 tpy triggers a secondary PM<sub>2.5</sub> air impact analysis. EPA has promulgated a two-tiered approach to assess secondary PM<sub>2.5</sub> impacts. A Tier I assessment uses the relationship between source characterization and modeled concentration of a representative (hypothetical) source to assess potential impacts from a new source. EPA has published hypothetical source modeled concentrations with relationship to location and source characterization in the April 2019 Modeled Emission Rates for Precursors (MERPs) Memo (MERPs guidance). These hypothetical sources use one year of meteorological data to determine modeled impacts.<sup>43</sup> The critical thresholds used were the recommended PM<sub>2.5</sub> SILs of 1.2 µg/m<sup>3</sup> for 24-hour and 0.2 µg/m<sup>3</sup> for the annual averaging periods.

**Table 8-3. EPA MERP Facilities in Arizona**

Source	County	Latitude	Longitude	Distance to South32 Hermosa (km)	Max Nearby Terrain (m)	Max Nearby Urban (%)
36	Coconino	35.428	-111.270	440	2,483	7.4
14	Gila	33.469	-110.789	220	1,592	4.3
17	La Paz	33.400	-113.408	330	757	0.9

The first step was to define the applicable MERP to use in the secondary PM<sub>2.5</sub> assessment. There are three hypothetical model sources in Arizona presented in the EPA MERP guidance, summarized in Table 8-2. The MERP guidance states that the representativeness of a hypothetical source is based on the chemical and

<sup>42</sup> Ibid.

physical environment (e.g., meteorology, background pollutant concentrations, and regional/local emissions). Hypothetical Source 17 (FIPS 4007) was representative of the Hermosa Project based on the following:

- ▶ **Proximity** – Source 14 in Gila County is the closest hypothetical source to the Hermosa Project, approximately 220 km away and Source 17 in La Paz county is the second closest hypothetical source at a distance of approximately 330km.
- ▶ **Terrain & Land Use** – Both Source 14 and Source 17 have similar surrounding land use to the Hermosa Project; both have a low level of urban influence since neighboring towns/cities are not located in close proximity to the locations.
- ▶ **Climate** – Due to the proximity of the three sites in southern Arizona, and the absence of any large bodies of water to influence the climate, the climate characteristics such as temperature and humidity are similar at all three sites.
- ▶ **Regional Sources of Pollutants** – Source 14 has large emission sources in the vicinity, such as Capstone Copper-Pinto Valley and ASARCO’s Hayden Smelter. Source 17 does not have large emission sources in the vicinity. The Hermosa Project is located in rural AZ and does not have any large emission sources in the vicinity. These existing large emission sources may react with ammonia and other precursor chemicals, leaving fewer available precursors, thereby limiting secondary particulate formation. In terms of this parameter, the choice of Source 17 was more conservative.
- ▶ **Background Pollutant Concentrations** – Source 14 is located in the Miami SO<sub>2</sub> Nonattainment Area at a distance of 5 miles from the Miami smelter. Source 17 is located in an area which is in attainment for NO<sub>2</sub> and SO<sub>2</sub>. As such, Source 17 was more representative of the background concentrations compared to Source 14.

The MERP guidance provides data for a variety of model combinations, including a source height of 10 m vs. 90 m, and emission rates of 500 tons, 1,000 tons, and 3,000 tons. All emissions at the Hermosa Project are emitted from sources lower in height; therefore, a stack height of 10 m at Source 17 was representative. Emissions from NO<sub>x</sub> and SO<sub>2</sub> are both well under 500 tpy; therefore, an emission rate of 500 tons was the most representative. Based on above considerations, South32 Hermosa proposed Source 17 in La Paz County as the representative MERP source.

From the Hermosa Project, a MERP value was obtained for each applicable pollutant for each PM<sub>2.5</sub> averaging period. Specifically, a MERP value was needed for both NO<sub>x</sub> and SO<sub>2</sub> on a 24-hour and annual basis. EPA provides this MERP data based on different combinations of emission rates and source heights from each hypothetical source. South32 Hermosa used the worst-case (i.e., smallest in magnitude) MERP value from Source 17 for each averaging period in the secondary PM<sub>2.5</sub> evaluation. These values are summarized in Table 8-3 below.

**Table 8-4. Source 17 Worst-Case MERP Data**

Precursor	24-Hour Basis (tpy)	Annual Basis (tpy)
NO <sub>x</sub>	15,260	243,487
SO <sub>2</sub>	1,918	31,245

Pursuant to the EPA July 2022 guidance<sup>44</sup>, a proposed project with an increase of NO<sub>x</sub> and/or SO<sub>2</sub> emissions in excess of 40 tpy triggers a secondary PM<sub>2.5</sub> air impact analysis.

<sup>44</sup> Guidance for Ozone and Fine Particulate Matter Permit Modeling, U.S. EPA, July 29, 2022.

The combined primary and secondary impacts of PM<sub>2.5</sub> for the source impact analysis were assessed using the highest (AERMOD) modeled primary PM<sub>2.5</sub> concentration (HMC), the Class II SIL, precursor emissions, and the default MERPs. If the sum of the ratios in the equation below is less than 1, then the combined PM<sub>2.5</sub> impacts are below the PM<sub>2.5</sub> SIL. However, since the ratio is greater than 1, a cumulative analysis is necessary.

$$\begin{aligned} &\text{Secondary PM}_{2.5} \text{ Impact} \\ &= \left( \frac{\text{Highest primary PM}_{2.5} \text{ modeled concentration}}{\text{SIL}} + \frac{\text{NO}_x \text{ Emissions}}{\text{NO}_x \text{ MERP}} + \frac{\text{SO}_2 \text{ Emissions}}{\text{SO}_2 \text{ MERP}} \right) \\ &< 1 \end{aligned}$$

The secondary PM<sub>2.5</sub> impact concentration for the Hermosa Project is calculated below for both the 24-hour and annual basis.

**24-hour:**

$$\left( \frac{16.70}{1.2} + \frac{203.61}{15,260} + \frac{6.45}{1,918} \right) = 13.9 > 1$$

**Annual:**

$$\left( \frac{4.70}{0.2} + \frac{203.61}{243,487} + \frac{6.45}{31,245} \right) = 23.5 > 1$$

Since the ratio for each averaging period is greater than 1, a cumulative impact analysis was performed. To estimate the total concentration of PM<sub>2.5</sub>, PM<sub>2.5</sub> SILs 24-hour and annual values (i.e., 1.2 µg/m<sup>3</sup> and 0.2 µg/m<sup>3</sup> from FIPS 4012) calculated above for secondary PM<sub>2.5</sub> impact have been added to PM<sub>2.5</sub> model results (i.e., primary PM<sub>2.5</sub> impacts) for comparison to the applicable standards.

Secondary PM<sub>2.5</sub> Impact on NAAQS

$$\begin{aligned} &= \left( \text{PM}_{2.5} \text{ Modeled concentration} + \text{Background PM}_{2.5} \text{ concentration} \right. \\ &\left. + \left( \frac{\text{NO}_x \text{ Emissions}}{\text{NO}_x \text{ MERP}} + \frac{\text{SO}_2 \text{ Emissions}}{\text{SO}_2 \text{ MERP}} \right) * \text{SIL} \right) < \text{NAAQS} \end{aligned}$$

Results are included in Section 8 and demonstrate that the Hermosa Project will not interfere with attainment or maintenance of the NAAQS. Detailed calculations are noted below.

**24-Hour Averaging Period**

$$\text{Secondary PM}_{2.5} \text{ Impact Added to Primary PM}_{2.5} \text{ Impacts} = \left( \frac{\text{NO}_x \text{ Emissions}}{\text{NO}_x \text{ MERP}} + \frac{\text{SO}_2 \text{ Emissions}}{\text{SO}_2 \text{ MERP}} \right) \times \text{SIL}$$

$$\begin{aligned} \text{Secondary PM}_{2.5} \text{ Impact Added to Primary PM}_{2.5} \text{ Impacts} &= \left( \frac{204 \text{ tpy}}{15,260 \text{ tpy}} + \frac{6.45 \text{ tpy}}{1,918 \text{ tpy}} \right) \times 1.2 \text{ µg/m}^3 \\ &= 0.020 \text{ µg/m}^3 \end{aligned}$$

**Annual Averaging Period**

$$\text{Secondary PM}_{2.5} \text{ Impact Added to Primary PM}_{2.5} \text{ Impacts} = \left( \frac{\text{NO}_x \text{ Emissions}}{\text{NO}_x \text{ MERP}} + \frac{\text{SO}_2 \text{ Emissions}}{\text{SO}_2 \text{ MERP}} \right) \times \text{SIL}$$

$$\begin{aligned} \text{Secondary PM}_{2.5} \text{ Impact Added to Primary PM}_{2.5} \text{ Impacts} &= \left( \frac{204 \text{ tpy}}{243,487 \text{ tpy}} + \frac{6.45 \text{ tpy}}{31,245 \text{ tpy}} \right) \times 0.2 \text{ } \mu\text{g}/\text{m}^3 \\ &= 0.00021 \text{ } \mu\text{g}/\text{m}^3 \end{aligned}$$



## 9. ELECTRONIC FILES

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The electronic files provided as part of this submittal contain all of the air dispersion modeling analyses electronic input, output, and other files used to generate the results presented in this report. The following is a list of files provided:

- ▶ All AERMOD input, output, and plot files;
- ▶ AERMOD meteorological data files;
- ▶ AERMOD terrain data files;
- ▶ AERMET data files;
- ▶ AERMAP files;
- ▶ All BPIP/BPIPP input and output files; and
- ▶ All AERSURFACE files.

## **APPENDIX A. MODELED EMISSION RATES AND SOURCE PARAMETERS**

**Mine Development  
Plan I Modeling**

Mine Development  
Point Sources

Table A-1. South32 Hermosa Point Sources

Source ID	Description	From BREEZE Model						Short Term Emission Rate (g/s)					Long Term Term Emission Rate (g/s)		Stk Ht (m)	Stk Temp (K)	Stk Vel (m/s)	Stk Diam (m)
		UTMx	UTMy	Elev (m)		Monthly	annual	PM <sub>10</sub> 24 hour	PM <sub>2.5</sub> 24 hour	Lead 3 month	NOx 1 hour	CO 1 hour/8 hour	PM <sub>2.5</sub> Annual	NOx Annual				
				1/8-hr	24-hr													
				1/8-hr	24-hr													
CT1	Cooling Tower Cell 1	526030.8	3481014.7	1572.77	1572.77		1572.77	1.93E-04	6.73E-05			6.73E-05		15.00	0.00	93.69	5.00	
CT2	Cooling Tower Cell 2	526042.3	3481025.8	1572.77	1572.77		1572.77	1.93E-04	6.73E-05			6.73E-05		15.00	0.00	93.69	5.00	
CT3	Cooling Tower Cell 3	526053.3	3481036.6	1572.77	1572.77		1572.77	1.93E-04	6.73E-05			6.73E-05		15.00	0.00	93.69	5.00	
CT4	Cooling Tower Cell 4	526063.7	3481046.5	1572.77	1572.77		1572.77	1.93E-04	6.73E-05			6.73E-05		15.00	0.00	93.69	5.00	
WTP2CT1	WTP2 CT Cell 1	526383.5	3481244.8	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT2	WTP2 CT Cell 2	526384.4	3481248.5	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT3	WTP2 CT Cell 3	526385.6	3481252.0	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT4	WTP2 CT Cell 4	526386.7	3481255.4	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT5	WTP2 CT Cell 5	526387.8	3481259.0	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT6	WTP2 CT Cell 6	526389.0	3481262.7	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT7	WTP2 CT Cell 7	526390.3	3481266.0	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
WTP2CT8	WTP2 CT Cell 8	526391.1	3481269.5	1559.05	1559.05		1559.05	7.34E-05	1.46E-06			1.46E-06		6.41	0.00	93.69	2.74	
CT7	UG Refrigeration CT Cell 1	526356.0	3480742.7	1540.79	1540.79		1540.79	2.85E-04	9.92E-05			9.92E-05		15.00	0.00	93.69	5.00	
CT8	UG Refrigeration CT Cell 2	526352.9	3480737.2	1541.08	1541.08		1541.08	2.85E-04	9.92E-05			9.92E-05		15.00	0.00	93.69	5.00	
CT9	UG Refrigeration CT Cell 3	526349.8	3480731.7	1541.59	1541.59		1541.59	2.85E-04	9.92E-05			9.92E-05		15.00	0.00	93.69	5.00	
CT10	UG Refrigeration CT Cell 4	526346.8	3480726.9	1542.00	1542.00		1542.00	2.85E-04	9.92E-05			9.92E-05		15.00	0.00	93.69	5.00	
VRT2_1	Vent Raise - Taylor	526380.4	3480755.6	1550.56	1550.56		1550.56	9.54E-02	1.26E-02	1.81E-04	1.46E-01	7.89E+00	9.54E-03	4.31E-03	13.00	296.95	11.47	4.28
VRT2_2	Vent Raise - Taylor	526367.5	3480762.0	1545.06	1545.06		1545.06	9.54E-02	1.26E-02	1.81E-04	1.46E-01	7.89E+00	9.54E-03	4.31E-03	13.00	296.95	11.47	4.28
VRT1_1	Ventilation Shaft - Taylor	526141.6	3480984.3	1573.32	1573.32		1573.32	2.63E-01	3.46E-02	4.98E-04	4.02E-01	2.17E+01	2.63E-02	1.19E-02	13.00	293.85	21.37	5.21
VRT1_2	Ventilation Shaft - Taylor	526133.6	3481001.5	1570.59	1570.59		1570.59	2.63E-01	3.46E-02	4.98E-04	4.02E-01	2.17E+01	2.63E-02	1.19E-02	13.00	293.85	21.37	5.21
DC-1	21300-DCD-001 Coarse Ore Dust Collection	525957.6	3481020.7	1572.80	1572.80		1572.80	6.91E-03	6.91E-03	3.43E-04			6.91E-03		8.23	0.00	15.21	0.36
DC-2	21300-DCD-002 Coarse Ore Silo Collection	525946.8	3481009.8	1572.80	1572.80		1572.80	1.03E-02	1.03E-02	5.09E-04			1.03E-02		27.43	0.00	13.66	0.38
DC-3	21300-DCD-003 Coarse Ore Silo Collection	525840.1	3480779.7	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04			7.13E-03		27.43	0.00	13.66	0.38
DC-4	21300-DCD-004 Coarse Ore Silo Collection	525866.7	3480779.1	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04			7.13E-03		27.43	0.00	13.66	0.38
DC-5	21300-DCD-005 Coarse Ore Silo Collection	525860.1	3480760.8	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04			7.13E-03		27.43	0.00	13.66	0.38
DC-6	21300-DCD-006 Silo Discharge Dust Collection	525844.7	3480756.5	1602.33	1602.33	1602.33	1602.33	1.62E-02	1.62E-02	8.04E-04			1.62E-02		5.49	0.00	13.21	0.58
DC-7	Coarse Ore Dust Collection System,23100-DCD-001 #1	526842	3480691.4	1550.70	1550.70		1550.70	3.46E-03	3.46E-03	6.08E-05			3.46E-03		5.49	0.00	13.21	0.58
DC-8	Coarse Ore Dust Collection System,23100-DCD-005 #2	526813.3	3480714.4	1552.40	1552.40		1552.40	3.46E-03	3.46E-03	6.08E-05			3.46E-03		5.49	0.00	13.21	0.58
DC-10	Coarse Ore Dust Collection System,23100-DCD-002 #3	526808.2	3480714.4	1552.75	1552.75		1552.75	3.46E-03	3.46E-03	6.08E-05			3.46E-03		5.49	0.00	13.21	0.58
DC-11	21300-DCD-005 Coarse Ore Silo Collection System collecting dust from entrance to 21500-SLO-004 Coarse Ore Silo No. 4	525849.1	3480796.7	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04			7.13E-03		27.43	0.00	13.66	0.38
VRHS1_1	Ventilation - Exhaust Raises NE Hardshell #1	527359.8	3480617.4	1604.25	1604.25		1604.25	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS1_2	Ventilation - Exhaust Raises NE Hardshell #1	527359.8	3480627.4	1605.45	1605.45		1605.45	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS2_1	Ventilation - Exhaust Raises NE Hardshell #2	527370.6	3480628.0	1603.13	1603.13		1603.13	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS2_2	Ventilation - Exhaust Raises NE Hardshell #2	527370.6	3480638.0	1603.67	1603.67		1603.67	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS3_1	Ventilation - Exhaust Raise SE Hardshell	527406.0	3479986.0	1661.92	1661.92		1661.92	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS3_2	Ventilation - Exhaust Raise SE Hardshell	527406.0	3479966.0	1667.17	1667.17		1667.17	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
ENG5	CUMMINS POWER GENERATION C200D2RE	527018.4	3480627.4	1560.52	1560.52		1560.52	1.21E-03	1.21E-03	2.42E-02	2.12E-01	1.21E-03	2.42E-02	1.80	726.15	0.07	0.10	
ENG9	CAT C175 Substation 1	525791.0	3480726.0	1609.17	1609.17		1609.17	3.67E-02	3.67E-02	1.83E-01	3.21E+00	3.67E-02	3.21E+00	2.23	745.45	12.09	0.61	
ENG10	CAT C175 Substation 2	525796.0	3480722.0	1609.01	1609.01		1609.01	3.67E-02	3.67E-02	1.83E-01	3.21E+00	3.67E-02	3.21E+00	2.23	745.45	12.09	0.61	
ENG11	CAT C175 Substation 3	525785.0	3480730.0	1609.52	1609.52		1609.52	3.67E-02	3.67E-02	1.83E-01	3.21E+00	3.67E-02	3.21E+00	2.23	745.45	12.09	0.61	
ENG12	CAT C175 Shaft 1	526093.0	3480998.0	1573.87	1573.87		1573.87	3.67E-02	3.67E-02	1.83E-01	3.21E+00	3.67E-02	3.21E+00	2.23	745.45	12.09	0.61	
ENG13	CAT C175 Shaft 2	526095.0	3480995.0	1573.56	1573.56		1573.56	3.67E-02	3.67E-02	1.83E-01	3.21E+00	3.67E-02	3.21E+00	2.23	745.45	12.09	0.61	
75TNG1	NG Trench 75%	525754.9	3480877.4	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG2	NG Trench 75%	525763.2	3480873.8	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG3	NG Trench 75%	525771.1	3480870.1	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG4	NG Trench 75%	525778.8	3480866.3	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG5	NG Trench 75%	525786.4	3480863.1	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG6	NG Trench 75%	525794.3	3480859.6	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG7	NG Trench 75%	525801.7	3480856.1	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG8	NG Trench 75%	525810	3480852.3	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG9	NG Trench 75%	525817.5	3480848.6	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG10	NG Trench 75%	525824.3	3480845.2	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG11	NG Trench 75%	525831.7	3480841.6	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG12	NG Trench 75%	525840	3480837.9	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG13	NG Trench 75%	525847.5	3480834.2	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG14	NG Trench 75%	525764.8	3480894.6	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG15	NG Trench 75%	525773.1	3480891.1	1591.06	1591.06	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81	
75TNG16	NG Trench 75%	525781	3480887.3	1591.06	1591.06	1581.91	158											

**Mine Development  
Point Sources**

Source ID	Description	From BREEZE Model							Short Term Emission Rate (g/s)				Long Term Term Emission Rate (g/s)		Stk Ht (m)	Stk Temp (K)	Stk Vel (m/s)	Stk Diam (m)
		UTMx	UTMy	Elev (m)				PM <sub>10</sub>	PM <sub>2.5</sub>	Lead 3 month	NOx 1 hour	CO 1 hour/8 hour	PM <sub>2.5</sub> Annual	NOx Annual				
				1/8-hr	24-hr	Monthly	annual											
75TNG23	NG Trench 75%	525834.2	3480862.4	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG24	NG Trench 75%	525841.6	3480858.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG25	NG Trench 75%	525849.9	3480855.1	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG26	NG Trench 75%	525857.4	3480851.4	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG27	NG Trench 75%	525775.1	3480912.3	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG28	NG Trench 75%	525783.4	3480908.7	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG29	NG Trench 75%	525791.3	3480905	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG30	NG Trench 75%	525799	3480901.2	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG31	NG Trench 75%	525806.6	3480897.9	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG32	NG Trench 75%	525814.5	3480894.5	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG33	NG Trench 75%	525822.2	3480890.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG34	NG Trench 75%	525829.9	3480887	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG35	NG Trench 75%	525837.5	3480883.7	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG36	NG Trench 75%	525845.4	3480880.3	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG37	NG Trench 75%	525851.4	3480876.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG38	NG Trench 75%	525858.9	3480872.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG39	NG Trench 75%	525867.5	3480869.4	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG40	NG Trench 75%	525786.2	3480931.4	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG41	NG Trench 75%	525794.5	3480927.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG42	NG Trench 75%	525802.4	3480924.1	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG43	NG Trench 75%	525810.1	3480920.3	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG44	NG Trench 75%	525817.7	3480917	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG45	NG Trench 75%	525825.6	3480913.6	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG46	NG Trench 75%	525833.3	3480909.9	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG47	NG Trench 75%	525841	3480906.1	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG48	NG Trench 75%	525848.6	3480902.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG49	NG Trench 75%	525856.5	3480899.4	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG50	NG Trench 75%	525862.5	3480895.9	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG51	NG Trench 75%	525870	3480891.9	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG52	NG Trench 75%	525878.6	3480888.5	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG53	NG Trench 75%	525797	3480949.3	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG54	NG Trench 75%	525805.3	3480945.7	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG55	NG Trench 75%	525813.2	3480942	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG56	NG Trench 75%	525820.9	3480938.2	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG57	NG Trench 75%	525828.5	3480934.9	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
75TNG58	NG Trench 75%	525836.4	3480931.5	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02		4.07E-02	1.46E-02	1.71E-02	4.07E-02	5.58	761.02	4.68	0.81
HS1	Diesel Hardshell	527306.3	3480572.3	1581.32	1581.32	1581.32	1581.32	2.78E-03	2.78E-03		2.78E-02	2.78E-03	2.78E-03	2.78E-02	2.90	745.15	5.75	0.80
HS2	Diesel Hardshell	527310.6	3480571.4	1581.72	1581.72	1581.72	1581.72	2.78E-03	2.78E-03		2.78E-02	2.78E-03	2.78E-03	2.78E-02	2.90	745.15	5.75	0.80
HS3	Diesel Hardshell	527314.6	3480570.7	1582.33	1582.33	1582.33	1582.33	2.78E-03	2.78E-03		2.78E-02	2.78E-03	2.78E-03	2.78E-02	2.90	745.15	5.75	0.80
HS4	Diesel Hardshell	527318.5	3480569.7	1583.38	1583.38	1583.38	1583.38	2.78E-03	2.78E-03		2.78E-02	2.78E-03	2.78E-03	2.78E-02	2.90	745.15	5.75	0.80
HS5	Diesel Hardshell	527322.8	3480568.8	1584.52	1584.52	1584.52	1584.52	2.78E-03	2.78E-03		2.78E-02	2.78E-03	2.78E-03	2.78E-02	2.90	745.15	5.75	0.80
HS6	Diesel Hardshell	527327.2	3480568	1585.76	1585.76	1585.76	1585.76	2.78E-03	2.78E-03		2.78E-02	2.78E-03	2.78E-03	2.78E-02	2.90	745.15	5.75	0.80
100TNG1	NG Trench 100%	525754.9	3480877.4	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG2	NG Trench 100%	525763.2	3480873.8	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG3	NG Trench 100%	525771.1	3480870.1	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG4	NG Trench 100%	525778.8	3480866.3	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG5	NG Trench 100%	525786.4	3480863	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG6	NG Trench 100%	525794.3	3480859.6	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG7	NG Trench 100%	525801.7	3480856	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG8	NG Trench 100%	525810	3480852.3	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG9	NG Trench 100%	525817.5	3480848.6	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG10	NG Trench 100%	525824.3	3480845.2	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG11	NG Trench 100%	525831.7	3480841.6	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG12	NG Trench 100%	525840	3480837.9	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81
100TNG13	NG Trench 100%</																	

Mine Development  
Point Sources

Source ID	Description	From BREEZE Model							Short Term Emission Rate (g/s)					Long Term Term Emission Rate (g/s)		Stk Ht (m)	Stk Temp (K)	Stk Vel (m/s)	Stk Diam (m)
		UTMx	UTMy	Elev (m)				PM <sub>10</sub> 24 hour	PM <sub>2.5</sub> 24 hour	Lead 3 month	NOx 1 hour	CO 1 hour/8 hour	PM <sub>2.5</sub> Annual	NOx Annual					
				1/8-hr	24-hr	Monthly	annual												
100TNG29	NG Trench 100%	525791.3	3480905	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG30	NG Trench 100%	525799	3480901.2	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG31	NG Trench 100%	525806.6	3480897.9	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG32	NG Trench 100%	525814.5	3480894.5	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG33	NG Trench 100%	525822.2	3480890.8	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG34	NG Trench 100%	525829.9	3480887	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG35	NG Trench 100%	525837.5	3480883.7	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG36	NG Trench 100%	525845.4	3480880.3	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG37	NG Trench 100%	525851.4	3480876.8	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG38	NG Trench 100%	525858.9	3480872.8	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG39	NG Trench 100%	525867.5	3480869.4	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG40	NG Trench 100%	525786.2	3480931.4	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG41	NG Trench 100%	525794.5	3480927.8	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG42	NG Trench 100%	525802.4	3480924.1	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG43	NG Trench 100%	525810.1	3480920.3	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG44	NG Trench 100%	525817.7	3480917	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG45	NG Trench 100%	525825.6	3480913.6	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG46	NG Trench 100%	525833.3	3480909.9	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG47	NG Trench 100%	525841	3480906.1	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG48	NG Trench 100%	525848.6	3480902.8	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG49	NG Trench 100%	525856.5	3480899.4	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG50	NG Trench 100%	525862.5	3480895.9	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG51	NG Trench 100%	525870	3480891.9	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG52	NG Trench 100%	525878.6	3480888.5	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG53	NG Trench 100%	525797	3480949.3	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG54	NG Trench 100%	525805.3	3480945.7	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG55	NG Trench 100%	525813.2	3480942	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG56	NG Trench 100%	525820.9	3480938.2	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG57	NG Trench 100%	525828.5	3480934.9	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	
100TNG58	NG Trench 100%	525836.4	3480931.5	1591.06	1581.91	1581.91	1581.91	2.07E-03	2.07E-03		8.13E-02	1.35E-02	2.07E-03	8.13E-02	5.58	742.87	6.03	0.81	

**Mine Development  
Horz point**

**Table A-2. South32 Hermosa Horizontal Point Sources**

Source ID	Description	From BREEZE Model			Short Term Emission Rate (g/s)				Long Term	Stk Ht (m)	Stk Temp (K)	Stk Vel (m/s)	Stk Diam (m)
		UTMx	UTMy	Elev (m)	PM10	PM2.5	Lead	PM <sub>2.5</sub>					
					24 hour	24 hour	3 month	Annual					
<b>Taylor</b>													
DCCBP	CBP Cement Silo	525974.0	3481133.8	1,577.88	2.40E-05	2.40E-05	0.00E+00	2.40E-05	10.7	0.00	4.00	0.32	
DCCBPS	CBP Cement Supplement Silo	525979.6	3481135.6	1,577.70	5.15E-05	5.15E-05	0.00E+00	5.15E-05	10.7	0.00	4.00	0.32	
DCPPBS1	Paste Plant Binder Silo 1	526438.3	3481085.1	1,554.48	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.32	
DCPPBS2	Paste Plant Binder Silo 2	526440.6	3481079.4	1,554.48	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.32	
DCPPBS3	Paste Plant Binder Silo 3	526441.9	3481073.8	1,554.48	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.32	
DCPPBS4	Paste Plant Binder Silo 4	526443.0	3481068.9	1,554.48	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.32	
DCPPM1M	Paste Plant Module 1 Mixer	526444.7	3481063.0	1,554.48	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.32	
DCPPM2M	Paste Plant Module 2 Mixer	526446.2	3481058.1	1,554.48	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.32	
WTP1LS	Waste Water Treatment Plant #1 Lime Silo	525788.3	3481926.3	1503.73	5.40E-03	5.40E-03	0.00E+00	5.40E-03	6.4	0.00	4.00	0.32	
<b>Clark</b>													
DCCCBP	CBP Cement Silo	527166.30	3480484.30	1,620.27	1.18E-06	1.18E-06	0.00E+00	1.18E-06	10.7	0.00	4.00	0.32	
DCCCBPS	CBP Cement Supplement Silo	527166.30	3480484.30	1,620.27	1.71E-05	1.71E-05	0.00E+00	1.71E-05	10.7	0.00	4.00	0.32	
DCCPPBS1	Paste Plant Binder Silo 1	527318.3	3480489.5	1,606.44	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.32	
DCCPPBS2	Paste Plant Binder Silo 2	527319.5	3480485.3	1,607.59	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.32	
DCCPPBS3	Paste Plant Binder Silo 3	527321	3480480.7	1,608.98	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.32	
DCCPPBS4	Paste Plant Binder Silo 4	527322.5	3480475.7	1,610.21	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.32	
DCCPPM1M	Paste Plant Module 1 Mixer	527324	3480472.4	1,611.26	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.32	
DCCPPM2M	Paste Plant Module 2 Mixer	527325.5	3480467.5	1,612.33	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.32	

Mine Development  
Area Sources

Table A-3. South32 Hermosa Area Sources

Type of Pile	Source ID	Description	From BREEZE Model			Short Term Emission Rate (g/s/m <sup>2</sup> )			Long Term Emission Rate (g/s/m <sup>2</sup> )			Rel Ht (m)	Xlength (m)	Ylength (m)	Angle	Init vert dim	Area (sq. ft)	Area (m <sup>2</sup> )
			UTMx	UTMy	Elev (m)		PM10	PM2.5	Lead	PM2.5								
					24-hr	monthly					annual							
Polygon	TSF2	USFS Tailings Storage Facility																
TSF-3	TSF_3	Tailing Storage Facility	525820.0	3481442.1	1,584.96	1,584.96	1,584.96	1.38E-06	2.07E-07	1.11E-08	2.07E-07	4.57	POLYGON			2.13	2,535,243.20	200,851.20
Polygon	WRS	West Rock Stockpile	525625.8	3480953.2	1,595.12	1,590.04	1,590.04	3.73E-07	5.59E-08	2.64E-09	5.59E-08	4.57	POLYGON			2.13	297,598.55	27,647.80
Polygon	ERS	East Rock Stockpile	525787.7	3480958.7	1,581.91	1,581.91	1,581.91	3.73E-07	5.59E-08	2.64E-09	5.59E-08	4.57	POLYGON			2.13	329,656.92	30,626.12
Polygon	HRS	Hardshell Rock Stockpile	526991.6	3480492.9	1,623.06	1,600.20	1,600.20	3.74E-07	5.61E-08	2.65E-09	5.61E-08	4.57	POLYGON			2.13	1,138,607.52	105,524.10
Circular	ROM	Clark ROM Stockpile	526856.2	3480646.2	1,559.60			3.73E-07	5.59E-08	1.31E-08	5.59E-08	3.05	RADIUS->	20.95	20.00	1.42	14,839.60	1,378.64
Rectangular	ORE	Clark Ore Stockpile	527205.0	3480657.0	1,571.71			3.73E-07	5.59E-08	1.31E-08	5.59E-08	3.05	60.96	76.20	110.00	1.42	50,000.52	4,645.20
Rectangular	AGG	Clark Agg Stockpile	527186.9	3480489.4	1,619.40			7.80E-08	1.17E-08		1.17E-08	3.05	18.29	4.57	110.00	1.42	899.86	83.60
Rectangular	SHOT	Clark Shotcrete Stockpile	527165.6	3480481.1	1,620.82			7.80E-08	1.17E-08		1.17E-08	3.05	12.19	12.19	-10.00	1.42	1,599.52	148.60
Rectangular	TAGG	Taylor Agg Stockpile	525986.5	3481131.9	1,577.89			7.80E-08	1.17E-08		1.17E-08	3.05	18.29	4.57	110.00	1.42	899.86	83.60
Rectangular	TSHOT	Taylor Shotcrete Stockpile	525998.4	3481132.9	1,575.48			7.80E-08	1.17E-08		1.17E-08	3.05	12.19	12.19	-10.00	1.42	1,599.52	148.60



Mine Development  
Volume Sources

Table A-4. South32 Hermosa Volume Sources

Source ID	Description	From BREEZE Model			Elev (m)	Short Term Emission Rate (g/s)	Long Term Emission Rate (g/s)	Source Vertical Dimension (m)	Source Width (m)	Rel Ht (m)	Init Lat Dim	Init Vert. Dim				
		UTMx	UTMy	24-hr									PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	PM <sub>2.5</sub>
				monthly									annual			
<b>Taylor</b>																
DP1	Drop of the crushed ore from the mine to the 21200-BIN-001 Mine Shaft Ore Bin	525971.2	3480990.7	1573.07	1573.07	3.17E-02	4.81E-03	2.90E-03	4.09E-03	-	2.00	24.92	0.47	3.06		
DP2	Drop from 21200-BIN-001 Mine Shaft Ore Bin to 21200-FOR-001 Mine Shaft Ore Discharge Feeder	525971.2	3480990.7	1573.07	1573.07	3.17E-02	4.81E-03	2.90E-03	4.09E-03	-	2.00	6.40	0.47	0.85		
DP18	Drop from 21210-CV-00001 Primary Mill Feed Conveyor to 22100-CH-00001 Primary Mill Feed Chute	525704.7	3480821.2	1603.25		4.01E-02	6.08E-03	3.55E-03	4.09E-03	-	2.25	10.73	0.52	0.46		
DP21	Drop from 22210-CV-00002 Primary Screen Discharge Conveyor to 22210-CV-0001 Pebble Crusher Feed Conveyor	525705.9	3480834	1603.25		2.07E-02	3.13E-03	5.60E-04	2.67E-03	-	-	1.78	0.43	0.83		
DP82	Drop on Rock Stockpile	525582.2	3480891.9	1595.12	1590.04	9.09E-03	1.38E-03	6.80E-05	1.38E-03	7.07	3.43	0.70	0.80	3.29		
DP83	Drop on East Rock Stockpile	525809.7	3480893.4	1581.91	1581.91	1.01E-02	1.52E-03	7.54E-05	1.52E-03	7.07	3.43	0.70	0.80	3.29		
DP84	TSF	525986.2	3481278.7	1584.96	1584.96	1.88E-02	2.84E-03	1.59E-04	2.84E-03	7.07	3.43	0.70	0.80	3.29		
DP85	Drops on TSF2									7.07	3.43	0.70	0.80	3.29		
DP94	Transfer from Agg Stockpile to Loader	525985.7	3481122.8	1571.07		9.02E-03	1.37E-03	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16		
DP95	Transfer of Agg Material from Loader to Haul Truck	525985.7	3481122.8	1571.07		9.02E-03	1.37E-03	0.00E+00	1.70E-04	3.75	2.04	0.89	0.47	0.87		
DP96	Transfer of Shotcrete Aggregate from Stockpile to Loader	526003.3	3481140.2	1569.67		6.31E-03	9.56E-04	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16		
CBP1_11	CBP Plant	525975.4	3481139.1	1577.31		8.15E-03	8.15E-03	0.00E+00	8.15E-03	-	-	2.40	4.52	2.23		
CRUSH2	Pebble Crushing	525822.7	3480776.7	1602.33		1.60E-01	2.47E-02	3.94E-03	2.14E-02	-	-	13.72	2	12.76		
DPWTP2	WTP2 Reagent Drops inside bldg	526396.80	3481207.50	1561.01		1.72E-05	2.61E-06	0.00E+00	1.72E-05	-	-	0.70	0.80	1.74		
DOZTSF_3	Dozer on TSF_3	526145	3481450	1584.96	1584.96	6.01E-02	2.97E-02	1.13E-03	2.97E-02	-	-	1.75	0.96	0.94		
DOZWRS	Dozer on West Rock Stockpile	525526	3480957.5	1590.04	1590.04	4.12E-03	3.28E-03	1.11E-04	3.28E-03	-	-	1.75	0.96	0.94		
DOZERS	Dozer on East Rock Stockpile	525990.5	3480890.1	1581.91	1581.91	4.12E-03	3.28E-03	1.11E-04	3.28E-03	-	-	1.75	0.96	0.94		
MEVAP1	Mechanical Evaporator 1	525908.5	3481579	1513.31	1513.31	6.82E-03	1.02E-03	0.00E+00	1.71E-04	-	-	5.33	5.01	2.48		
MEVAP2	Mechanical Evaporator 2	525917.9	3481642.2	1512.68	1512.68	6.82E-03	1.02E-03	0.00E+00	1.71E-04	-	-	5.33	5.01	2.48		
MEVAP3	Mechanical Evaporator 3	525853.4	3481615.7	1511.22	1511.22	6.82E-03	1.02E-03	0.00E+00	1.71E-04	-	-	5.33	5.01	2.48		
PP1	Truck Pneumatic Loadout to Silo 1	526439.8	3481085.7	1551.77	1551.77	4.19E-04	8.74E-05	0.00E+00	8.74E-05	-	-	2.00	1.16	4.98		
PP2	Truck Pneumatic Loadout to Silo 2	526442.2	3481079.9	1551.73	1551.73	4.19E-04	8.74E-05	0.00E+00	8.74E-05	-	-	2.00	1.16	4.98		
<b>Clark</b>																
DP103	Haul Truck Dump into Primary Crusher Feed Hopper from ROM Stockpile (23100-HPR-0001)	526837.8	3480679.9	1554.48		6.06E-03	9.18E-04	1.51E-04	5.96E-04	3.75	3.43	3.92	0.80	1.74		
DP104	Drop from silo to trucks	526810.7	3480704.9	1554.48		1.41E-02	2.14E-03	5.02E-04	1.99E-03	-	-	4.957	0.593	0.496		
DP105	Transfer of Development Ore from Ore Stockpile to Loader	527220	3480626	1568.34		7.88E-03	1.19E-03	2.93E-04	1.19E-03	2.59	2.04	1.30	0.47	1.16		
DP106	Transfer of Development Ore Mined from Loader to Haul Truck	527220	3480626	1568.34		7.88E-03	1.19E-03	2.93E-04	1.19E-03	3.75	2.04	0.89	0.47	0.87		
DP107	Transfer from ROM Stockpile to Loader	526856.2	3480646.2	1559.60		2.16E-03	3.27E-04	8.03E-05	3.27E-04	2.59	2.04	1.30	0.47	1.16		
DP109	Transfer from Agg Stockpile to Loader	527187	3480489	1619.40		9.02E-03	1.37E-03	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16		
DP110	Transfer of Agg Material from Loader to Haul Truck	527187	3480489	1619.40		9.02E-03	1.37E-03	0.00E+00	1.70E-04	3.75	2.04	0.89	0.47	0.87		
DP111	Transfer of Shotcrete Aggregate from Stockpile to Loader	527168	3480482	1620.95		6.31E-03	9.56E-04	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16		
DP113	Hardshell Rock Storage Drop	527194	3480105	1623.06	1600.20	3.53E-02	5.35E-03	1.31E-03	5.35E-03	3.75	3.43	0.70	0.80	1.74		
DP114	Ore Stockpile Drop	527220	3480626	1568.34		7.88E-03	1.19E-03	2.93E-04	1.19E-03	3.75	3.43	0.70	0.80	1.74		
DP115	ROM Stockpile Drop	526856.2	3480646.2	1559.96		2.16E-03	3.27E-04	8.03E-05	3.27E-04	3.75	3.43	0.70	0.80	1.74		
CCBP1_11	Clark CBP Plant	527171.7	3480490.4	1619.37		4.16E-04	4.16E-04	0.00E+00	4.16E-04	-	-	2.40	4.52	2.23		
DOZHRS	Dozer on Hardshell Rock Stockpile	526990.0	3480298.5	1600.20	1600.20	4.12E-03	3.28E-03	1.11E-04	3.28E-03	-	-	1.75	0.96	0.94		
BREAK1	Clark Rock Breaker	526812.60	3480694.90	1554.50		1.21E-04	1.84E-05	1.35E-07	8.21E-06	-	-	1.78	0.43	0.83		
PP3	Truck Pneumatic Loadout to Silo 1	527319.5	3480489.7	1606.84		2.10E-04	4.37E-05	0.00E+00	4.37E-05	-	-	2.00	1.16	4.98		
PP4	Truck Pneumatic Loadout to Silo 2	527320.7	3480485.8	1607.94		2.10E-04	4.37E-05	0.00E+00	4.37E-05	-	-	2.00	1.16	4.98		

Mine Development  
Mod - Area Road Param

Table A-5. South32 Hermosa Road Area Sources

Index	ID	Description	X	Y	Elevation	PM10 daily	PM2.5 daily	PM2.5 annual	Lead daily	Area	Release height	X length	Y length	Angle	Init. Vert. dim.
						Total Daily PM <sub>10</sub> (g/s m <sup>2</sup> )	Total Daily PM <sub>2.5</sub> (g/s m <sup>2</sup> )	Total Annual PM <sub>2.5</sub> (g/s m <sup>2</sup> )	Total Daily Pb (g/s m <sup>2</sup> )						
	CRAREA1		526380.2	3480832	1538.7	3.81E-06	3.81E-07	3.08E-07	3.62E-10	240	3.06	12	20	1	2.84
	CRAREA2		526376.7	3480866	1524.89	8.90E-06	8.90E-07	5.49E-07	8.45E-10	1065	2.39	15	71	62	2.23
	CRAREA3		526446.8	3480899.4	1521.98	1.31E-05	1.31E-06	7.96E-07	1.24E-09	516	2.39	12	43	83	2.23
	CRAREA4		526493	3480903	1521.1	1.25E-05	1.25E-06	7.60E-07	1.19E-09	540	2.39	12	45	90	2.23
	CRAREA5		526539	3480903	1519.88	1.34E-05	1.34E-06	8.15E-07	1.27E-09	336	2.39	12	28	48.1	2.23
	CRAREA6		526562	3480922	1518.95	9.68E-06	9.68E-07	5.88E-07	9.20E-10	931.2	2.39	16	58.2	14.5	2.23
	CRAREA7		526628.30	3481008.50	1518.46	1.97E-05	1.97E-06	1.31E-06	1.87E-09	398.04	2.32	12.4	32.1	95.9	2.15
	CRAREA8		526671.9	3481003.3	1523.15	3.26E-05	3.26E-06	2.18E-06	3.10E-09	360	2.32	12	30	112	2.15
	CRAREA9		526700.5	3480985.9	1525.15	4.57E-05	4.57E-06	3.05E-06	4.34E-09	600	2.32	8	75	133	2.15
	CRAREA10		526747.8	3480924.2	1529.55	1.72E-05	1.72E-06	1.15E-06	1.64E-09	910	2.32	65	14	59	2.15
	CRAREA11		526786	3480867	1536.77	1.57E-05	1.57E-06	1.05E-06	1.49E-09	750	2.32	50	15	43	2.15
	CRAREA12		526606	3481131.5	1512.96	2.11E-05	2.11E-06	1.38E-06	2.00E-09	1363	2.18	94	14.5	103	2.03
	CRAREA13		526612.3	3481133.9	1512.95	1.89E-05	1.89E-06	1.24E-06	1.79E-09	759.9	2.18	17	44.7	32.1	2.03
	CRAREA14		526840.2	3480842.4	1544.55	1.78E-05	1.78E-06	1.19E-06	1.69E-09	1088	2.32	16	68	122	2.16
	CRAREA15		526911.3	3480690.7	1551.17	2.18E-05	2.18E-06	1.45E-06	2.07E-09	546	2.48	42	13	50.5	2.31
	CRAREA16		526953.3	3480585	1549.74	1.91E-05	1.91E-06	1.27E-06	1.81E-09	624	2.48	16	39	45	2.31
	CRAREA17		527423	3480286	1661.09	3.51E-06	3.51E-07	2.82E-07	3.33E-10	1320	3.10	110	12	90	2.89
	CRAREA18		527418.9	3480170.3	1674.33	3.46E-06	3.46E-07	2.78E-07	3.29E-10	1440	3.10	120	12	90	2.89
	CRAREA19		527420	3480049	1660.24	4.27E-06	4.27E-07	3.43E-07	4.06E-10	700	3.10	70	10	90	2.89
	CRAREA24		526304.8	3480773.8	1529.73	1.06E-05	1.06E-06	6.42E-07	1.00E-09	816.2	2.39	14	58.3	40.5	2.22
	CRAREA25		526279.1	3480771.3	1530.76	1.61E-05	1.61E-06	9.77E-07	1.53E-09	268	2.39	10	26.8	89.4	2.22
	CRAREA26		526192.4	3480836.3	1538.62	9.63E-06	9.63E-07	5.86E-07	9.15E-10	1565.55	2.39	14.7	106.5	124.6	2.22
	CRAREA29		526025.4	3480741.7	1550.06	3.08E-06	3.08E-07	2.56E-07	2.93E-10	629.06	3.11	14.2	44.3	78.9	2.89
	CRAREA33		526636.9	3481173.1	1513.21	2.70E-05	2.70E-06	1.88E-06	2.56E-09	1096.5	2.09	17	64.5	31.9	1.94

ID	Description	X	Y	Elevation	Emission Rate				Area	Release Height	Init. Vert. Dim.
					Total Daily PM <sub>10</sub> (g/s m <sup>2</sup> )	Total Daily PM <sub>2.5</sub> (g/s m <sup>2</sup> )	Total Annual PM <sub>2.5</sub> (g/s m <sup>2</sup> )	Total Daily Pb (g/s m <sup>2</sup> )			
CRAREA21		526597.6	3481020.6	1515.96	1.20E-05	1.20E-06	7.30E-07	1.14E-09	562.70	2.39	2.23
CRAREA22		526627.1	3481013.2	1518.58	2.07E-05	2.07E-06	1.37E-06	1.96E-09	610.27	2.18	2.03
CRAREA27		527371.7	3479931.9	1670.72	4.35E-06	4.35E-07	3.49E-07	4.13E-10	1144.63	3.10	2.89
CRAREA23		526374.4	3480853.7	1527.19	1.38E-05	1.38E-06	8.38E-07	1.31E-09	468.60	2.39	2.22
CRAREA27		526181.2	3480832.7	1538.35	1.35E-05	1.35E-06	8.20E-07	1.28E-09	798.73	2.39	2.22
CRAREA28		526121.2	3480800.8	1542.08	3.87E-06	3.87E-07	3.22E-07	3.68E-10	834.59	3.11	2.89
CRAREA30		526023.4	3480735.6	1548.96	3.53E-06	3.53E-07	2.93E-07	3.35E-10	1284.04	3.11	2.89
CRAREA31		526008.1	3480625	1553.09	3.28E-06	3.28E-07	2.73E-07	3.12E-10	1968.88	3.11	2.89
CRAREA32		525887.4	3480473.2	1553.94	3.38E-06	3.38E-07	2.81E-07	3.21E-10	765.49	3.11	2.89

Mine Development  
Mod - Vol Road Params

Table A-6. South32 Hermosa Road Volume Sources

Segment Name	INDEX	ID	Description	UTM X Coordinate (m)	UTM Y Coordinate(m)	Elevation (m)	Emission Rate				Emission Rate			Road Width (ft)	Road Width (m)	Adjusted Road Width (m)	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)	Area Source (If Applicable)	
							PM10 daily PM2.5 daily PM2.5 annual Lead daily				Total Daily PM10 (g/s)	Total Daily PM2.5 (g/s)	Total Annual PM2.5 (g/s)								Total Daily Lead (g/s)
							PM10 (g/s)	PM2.5 (g/s)	PM2.5 (g/s)	Lead (g/s)											
AR	1	TRAR_1	AR	526672.9	3481213.7	1511.02	7.39E-03	7.39E-04	5.15E-04	7.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.09	7.33	1.94	CRAREA33
AR	2	TRAR_2	AR	526665.4	3481199.6	1511.42	7.39E-03	7.39E-04	5.15E-04	7.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.09	7.33	1.94	CRAREA33
AR	3	TRAR_3	AR	526656.2	3481186.5	1512.16	7.39E-03	7.39E-04	5.15E-04	7.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.09	7.33	1.94	CRAREA33
AR	4	TRAR_4	AR	526646.8	3481173.6	1512.84	7.39E-03	7.39E-04	5.15E-04	7.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.09	7.33	1.94	CRAREA33
RS	5	CRRS_1	RS	526640.6	3481161.6	1513.04	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA13
RS	6	CRRS_2	RS	526631	3481148.8	1512.96	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA13
RS	7	CRRS_3	RS	526621.4	3481136	1512.82	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA13
RS	8	CRRS_4	RS	526611.8	3481123.2	1512.9	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA12
RS	9	CRRS_5	RS	526607.9	3481107.7	1513.1	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA12
RS	10	CRRS_6	RS	526604	3481092.2	1513.99	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA12
RS	11	CRRS_7	RS	526600.2	3481076.6	1514.46	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA12
RS	12	CRRS_8	RS	526596.3	3481061.1	1515.04	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA12
RS	13	CRRS_9	RS	526595.4	3481045.7	1515.62	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA12
RS	14	CRRS_10	RS	526599.9	3481030.3	1515.95	4.79E-03	4.79E-04	3.14E-04	4.54E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.18	7.33	2.03	CRAREA22
ST	15	TRST_1	ST	526591.4	3481018.5	1515.58	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA21
ST	16	TRST_2	ST	526589.7	3481002.6	1515.56	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA21
ST	17	TRST_3	ST	526587.4	3480986.8	1516.1	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA21
ST	18	TRST_4	ST	526583.9	3480971.2	1516.83	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA6
ST	19	TRST_5	ST	526579.8	3480955.7	1517.33	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA6
ST	20	TRST_6	ST	526575.4	3480940.4	1517.97	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA6
ST	21	TRST_7	ST	526568.6	3480925.9	1518.59	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA6
ST	22	TRST_8	ST	526559.1	3480913.3	1519.16	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA5
ST	23	TRST_9	ST	526547.6	3480902.2	1519.57	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA5
ST	24	TRST_10	ST	526532.8	3480896.2	1519.9	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA4
ST	25	TRST_11	ST	526516.8	3480896.8	1520.27	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA4
ST	26	TRST_12	ST	526500.8	3480897.3	1520.6	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA4
ST	27	TRST_13	ST	526484.8	3480896.6	1521.22	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA3
ST	28	TRST_14	ST	526468.9	3480895.2	1521.66	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA3
ST	29	TRST_15	ST	526453	3480893.7	1522.37	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA3
ST	30	TRST_16	ST	526437.6	3480889.7	1523.19	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA2
ST	31	TRST_17	ST	526423.1	3480882.8	1523.89	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA2
ST	32	TRST_18	ST	526408.7	3480876	1524.63	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA2
ST	33	TRST_19	ST	526394.2	3480869.2	1525.99	2.25E-03	2.25E-04	1.37E-04	2.14E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.23	CRAREA2
TU	34	TRTU_1	TU	526387.4	3480860	1527.69	4.58E-04	4.58E-05	3.70E-05	4.35E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.06	5.63	2.84	CRAREA2
TU	35	TRTU_2	TU	526387.3	3480848	1532.8	4.58E-04	4.58E-05	3.70E-05	4.35E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	36	TRTU_3	TU	526387.2	3480836	1537.8	4.58E-04	4.58E-05	3.70E-05	4.35E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	37	TRTU_4	TU	526387	3480824	1542.69	4.58E-04	4.58E-05	3.70E-05	4.35E-08	4.58E-04	4.58E-05	3.70E-05	4.35E-08	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	38	TRTU_5	TU	526383.2	3480812.7	1546.45	4.58E-04	4.58E-05	3.70E-05	4.35E-08	4.58E-04	4.58E-05	3.70E-05	4.35E-08	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	39	TRTU_6	TU	526380.9	3480801.2	1549.4	4.58E-04	4.58E-05	3.70E-05	4.35E-08	4.58E-04	4.58E-05	3.70E-05	4.35E-08	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	40	TRTU_7	TU	526381.9	3480789.2	1551.52	4.58E-04	4.58E-05	3.70E-05	4.35E-08	4.58E-04	4.58E-05	3.70E-05	4.35E-08	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	41	TRTU_8	TU	526379.5	3480778	1550.99	4.58E-04	4.58E-05	3.70E-05	4.35E-08	4.58E-04	4.58E-05	3.70E-05	4.35E-08	20	6.10	12.10	3.06	5.63	2.84	CRAREA1
TU	42	TRTU_9	TU	526373.7	3480767.4	1548.04	4.58E-04	4.58E-05	3.70E-05	4.35E-08	4.58E-04	4.58E-05	3.70E-05	4.35E-08	20	6.10	12.10	3.06	5.63	2.84	CRAREA2
SV	43	CRSV1_1	SV	526606.6	3481021.7	1516.44	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA22
SV	44	CRSV1_2	SV	526619.3	3481009.3	1517.37	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA22
SV	45	CRSV1_3	SV	526635.4	3481002.6	1518.66	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA7
SV	46	CRSV1_4	SV	526653.1	3480999.3	1520.23	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA7
SV	47	CRSV1_5	SV	526723.2	3480999.9	1531.4	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA10
SV	48	CRSV2_2	SV	526772.2	3480894.3	1533.43	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA10
SV	49	CRSV3_3	SV	526782.6	3480879.9	1535.47	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.32	8.46	2.15	CRAREA10
SV	50	CRSV3_4	SV	526795.9	3480867.7	1537.51	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2			

Mine Development  
Mod - Vol Road Params

LP	84	TRLP3_10	LP	525816.7	3481672.9	1510.55	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	85	TRLP4_1	LP	525820.3	3481662.2	1511.71	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	86	TRLP4_2	LP	525826.2	3481645.2	1512.35	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	87	TRLP4_3	LP	525831.1	3481628.2	1512.7	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	88	TRLP4_4	LP	525838	3481611.2	1513.09	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	89	TRLP4_5	LP	525843.9	3481594.2	1513.64	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	90	TRLP4_6	LP	525849.8	3481577.2	1514.85	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	91	TRLP4_7	LP	525855.7	3481560.2	1515.59	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	92	TRLP4_8	LP	525861.6	3481543.2	1516.43	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	93	TRLP4_9	LP	525869.3	3481526.7	1519.97	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	94	TRLP4_10	LP	525851.4	3481510.5	1522.14	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	95	TRLP5_1	LP	525840.8	3481503.3	1523.51	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	96	TRLP5_2	LP	525824.7	3481495.3	1525.91	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	97	TRLP5_3	LP	525808.6	3481487.3	1528.23	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	98	TRLP5_4	LP	525792.5	3481479.3	1529.68	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	99	TRLP5_5	LP	525779.4	3481467.1	1531.56	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	100	TRLP5_6	LP	525766.8	3481454.3	1533.15	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	101	TRLP5_7	LP	525754.2	3481441.4	1534.64	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
LP	102	TRLP5_8	LP	525741.6	3481428.6	1536.23	8.25E-04	8.25E-05	6.20E-05	7.83E-08	8.25E-04	8.25E-05	6.20E-05	7.83E-08	40	12.19	18.19	2.96	8.46	2.75
PR	103	TRPR_1	PR	525733.6	3481421.1	1536.96	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	104	TRPR_2	PR	525719.8	3481409.5	1538.32	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	105	TRPR_3	PR	525707.8	3481396.4	1540.23	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	106	TRPR_4	PR	525697.6	3481381.5	1542.27	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	107	TRPR_5	PR	525685.5	3481368.4	1543.91	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	108	TRPR_6	PR	525672	3481356.5	1545.18	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	109	TRPR_7	PR	525661.5	3481342.6	1545.95	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	110	TRPR_8	PR	525656.1	3481325.5	1546.26	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	111	TRPR_9	PR	525660.9	3481308.2	1546.44	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	112	TRPR_10	PR	525666.2	3481291	1546.42	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	113	TRPR_11	PR	525673.9	3481274.8	1546.32	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	114	TRPR_12	PR	525681.6	3481258.5	1547.32	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	115	TRPR_13	PR	525689.3	3481242.3	1549.23	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	116	TRPR_14	PR	525697	3481225.9	1559.94	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	117	TRPR_15	PR	525704.7	3481209.7	1565.32	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	118	TRPR_16	PR	525712.4	3481193.4	1568.8	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	119	TRPR_17	PR	525720.1	3481177.1	1571.66	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	120	TRPR_18	PR	525727.8	3481160.8	1574.96	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	121	TRPR_19	PR	525735.5	3481144.6	1578.16	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	122	TRPR_20	PR	525745.1	3481129.9	1579.49	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	123	TRPR_21	PR	525759.6	3481119.2	1580.71	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	124	TRPR_22	PR	525774.6	3481109.3	1583.24	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	125	TRPR_23	PR	525790.7	3481101.3	1583.23	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	126	TRPR_24	PR	525806.8	3481093.3	1582.33	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	127	TRPR_25	PR	525822.9	3481085.3	1582.09	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
PR	128	TRPR_26	PR	525839	3481077.3	1582.31	9.95E-04	9.95E-05	6.67E-05	9.45E-08	9.95E-04	9.95E-05	6.67E-05	9.45E-08	40	12.19	18.19	2.94	8.46	2.73
RH	129	TRRH_1	RH	525833.1	3481069.6	1582.65	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	130	TRRH_2	RH	525818.9	3481058.5	1582.59	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	131	TRRH_3	RH	525806	3481046.4	1580.23	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	132	TRRH_4	RH	525798.6	3481030	1577.67	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	133	TRRH_5	RH	525791.2	3481013.6	1578.36	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	134	TRRH_6	RH	525783.8	3480997.2	1579.2	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	135	TRRH_7	RH	525776.4	3480980.8	1584.52	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	136	TRRH_8	RH	525769.1	3480964.3	1589.9	9.35E-03	9.35E-04	4.17E-04	8.88E-07	9.35E-03	9.35E-04	4.17E-04	8.88E-07	40	12.19	18.19	2.30	8.46	2.14
RH	137	TRRH_9	RH	525757.1	3480947.9</															

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DB	175	TRDB_11	DB	526186.9	3481030.4	1561.57	1.02E-02	1.02E-03	6.14E-04	9.66E-07	1.02E-02	1.02E-03	6.14E-04	9.66E-07	40	12.19	18.19	2.35	8.46	2.18
DB	176	TRDB_12	DB	526204.8	3481030.6	1562.22	1.02E-02	1.02E-03	6.14E-04	9.66E-07	1.02E-02	1.02E-03	6.14E-04	9.66E-07	40	12.19	18.19	2.35	8.46	2.18
BQ	177	TRBQ_1	BQ	526218.8	3481023.8	1562.43	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BQ	178	TRBQ_2	BQ	526226.2	3481007.4	1562.45	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BQ	179	TRBQ_3	BQ	526233.5	3480991.1	1561.72	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BQ	180	TRBQ_4	BQ	526240.9	3480974.5	1555.44	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BQ	181	TRBQ_5	BQ	526248.3	3480958.3	1550.18	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BQ	182	TRBQ_6	BQ	526255.7	3480941.7	1546.49	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BQ	183	TRBQ_7	BQ	526263.1	3480925.3	1547.83	8.63E-04	8.63E-05	6.48E-05	8.19E-08	8.63E-04	8.63E-05	6.48E-05	8.19E-08	40	12.19	18.19	2.88	8.46	2.68
BM	184	TRBM_1	BM	526224.4	3481032.2	1562.23	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	185	TRBM_2	BM	526243.3	3481030	1562.06	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	186	TRBM_3	BM	526260.2	3481027.8	1562.1	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	187	TRBM_4	BM	526277.1	3481032.8	1562.22	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	188	TRBM_5	BM	526293.6	3481039.9	1562.23	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	189	TRBM_6	BM	526310.1	3481046.9	1562.3	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	190	TRBM_7	BM	526326.7	3481054	1562.39	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	191	TRBM_8	BM	526343.2	3481061.1	1562.4	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	192	TRBM_9	BM	526359.7	3481068.2	1562.63	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
BM	193	TRBM_10	BM	526376.3	3481075.3	1562.64	8.30E-03	8.30E-04	4.43E-04	7.89E-07	8.30E-03	8.30E-04	4.43E-04	7.89E-07	40	12.19	18.19	3.25	8.46	3.02
RB	194	TRRB_1	RB	526222.2	3481026	1562.36	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	195	TRRB_2	RB	526235.9	3481014.4	1562.3	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	196	TRRB_3	RB	526249.6	3481002.7	1561.89	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	197	TRRB_4	RB	526263.4	3480991.1	1561.12	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	198	TRRB_5	RB	526277.1	3480979.5	1559.53	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	199	TRRB_6	RB	526293.7	3480972.5	1557.73	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	200	TRRB_7	RB	526310.3	3480965.6	1555.24	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	201	TRRB_8	RB	526328.2	3480965.3	1553.7	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	202	TRRB_9	RB	526346.2	3480965.8	1552.13	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	203	TRRB_10	RB	526364.2	3480966.3	1549.81	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	204	TRRB_11	RB	526382.2	3480966.8	1548.47	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	205	TRRB_12	RB	526400.1	3480967.4	1546.28	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	206	TRRB_13	RB	526418.1	3480967.9	1544.39	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	207	TRRB_14	RB	526436.1	3480968.4	1542.45	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	208	TRRB_15	RB	526454.1	3480968.9	1540.69	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	209	TRRB_16	RB	526472.1	3480969.5	1538.56	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	210	TRRB_17	RB	526488.5	3480976.6	1538.32	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	211	TRRB_18	RB	526503	3480986.3	1538.58	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	212	TRRB_19	RB	526512.3	3481001.7	1536.02	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	213	TRRB_20	RB	526518.8	3481018.2	1532.96	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	214	TRRB_21	RB	526521.7	3481035.9	1532.16	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	215	TRRB_22	RB	526521.8	3481053.9	1530.94	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	216	TRRB_23	RB	526521.9	3481071.9	1530.25	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	217	TRRB_24	RB	526522	3481089.9	1529.65	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	218	TRRB_25	RB	526522.1	3481107.9	1527.46	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	219	TRRB_26	RB	526530.1	3481123.7	1522.39	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	220	TRRB_27	RB	526539.2	3481139.3	1522.16	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	221	TRRB_28	RB	526548.2	3481154.9	1522.61	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	222	TRRB_29	RB	526557.2	3481170.5	1520.82	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	223	TRRB_30	RB	526567.1	3481185	1518.73	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	224	TRRB_31	RB	526583.5	3481192.6	1517	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	225	TRRB_32	RB	526600.5	3481196.8	1515.14	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	226	TRRB_33	RB	526616.8	3481191.4	1513.4	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
RB	227	TRRB_34	RB	526631.1	3481180.4	1512.99	7.51E-03	7.51E-04	4.96E-04	7.14E-07	7.51E-03	7.51E-04	4.96E-04	7.14E-07	40	12.19	18.19	2.33	8.46	2.16
ZY	228	CRZY1_1	ZY	527425	3															

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SV	266	CRSV2_6	SV	526709.8	3480972.2	1524.99	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
SV	267	CRSV2_7	SV	526717.8	3480964.6	1525.97	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
SV	268	CRSV2_8	SV	526725.8	3480957.1	1527.05	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
SV	269	CRSV2_9	SV	526733.8	3480949.5	1527.76	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
SV	270	CRSV2_10	SV	526741.8	3480942	1528.41	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
SV	271	CRSV2_11	SV	526749.4	3480934.1	1529.18	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
SV	272	CRSV2_12	SV	526757	3480926.7	1530.13	3.92E-03	3.92E-04	2.62E-04	3.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.32	5.13	2.15	CRAREA9
GB	273	TRGB1_1	GB	526836.1	3481305.4	1546.84	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	18	5.33	11.33	3.24	5.27	3.01	CRAREA10
GB	274	TRGB1_2	GB	526840.8	3481322.8	1547.14	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	19	5.64	11.64	3.24	5.41	3.01	
GB	275	TRGB1_3	GB	526945	3481340.3	1547.57	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	20	5.94	11.94	3.24	5.56	3.01	
GB	276	TRGB1_4	GB	526953.7	3481355.3	1548.07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	21	6.25	12.25	3.24	5.70	3.01	
GB	277	TRGB1_5	GB	526969.5	3481363.1	1548.79	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	22	6.55	12.55	3.24	5.84	3.01	
GB	278	TRGB1_6	GB	526986.9	3481367.8	1550.07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	23	6.86	12.86	3.24	5.98	3.01	
GB	279	TRGB1_7	GB	526104	3481369.7	1552.01	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	24	7.16	13.16	3.24	6.12	3.01	
GB	280	TRGB1_8	GB	526119.1	3481359.9	1552.67	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	25	7.47	13.47	3.24	6.26	3.01	
GB	281	TRGB1_9	GB	526132.9	3481348.5	1552.3	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	26	7.77	13.77	3.24	6.41	3.01	
GB	282	TRGB1_10	GB	526146.7	3481336.9	1551.95	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	27	8.08	14.08	3.24	6.55	3.01	
GB	283	TRGB1_11	GB	526159.3	3481324.2	1550.96	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	28	8.38	14.38	3.24	6.69	3.01	
GB	284	TRGB1_12	GB	526165	3481307.5	1549.11	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	29	8.69	14.69	3.24	6.83	3.01	
GB	285	TRGB1_13	GB	526170.5	3481290.4	1548.33	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	30	8.99	14.99	3.24	6.97	3.01	
GB	286	TRGB1_14	GB	526176.3	3481273.4	1547.99	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	31	9.30	15.30	3.24	7.11	3.01	
GB	287	TRGB1_15	GB	526180.7	3481256	1540.2	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	32	9.60	15.60	3.24	7.26	3.01	
GB	288	TRGB1_16	GB	526185.3	3481238.8	1539.6	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	33	9.91	15.91	3.24	7.40	3.01	
GB	289	TRGB1_17	GB	526186.5	3481220.8	1539.4	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	34	10.21	16.21	3.24	7.54	3.01	
GB	290	TRGB1_18	GB	526188.6	3481202.9	1542.53	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	35	10.52	16.52	3.24	7.68	3.01	
GB	291	TRGB1_19	GB	526191.2	3481185.1	1547.76	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	36	10.82	16.82	3.24	7.82	3.01	
GB	292	TRGB1_20	GB	526189.9	3481167.3	1551.35	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	37	11.13	17.13	3.24	7.97	3.01	
GB	293	TRGB1_21	GB	526187.6	3481149.5	1549.84	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	38	11.43	17.43	3.24	8.11	3.01	
GB	294	TRGB1_22	GB	526184	3481131.9	1548.43	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	39	11.73	17.73	3.24	8.25	3.01	
GB	295	TRGB1_23	GB	526176.4	3481115.6	1548.89	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	40	12.04	18.04	3.24	8.39	3.01	
GB	296	TRGB1_24	GB	526168.3	3481099.5	1549.36	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	41	12.34	18.34	3.24	8.53	3.01	
GB	297	TRGB1_25	GB	526159.6	3481083.7	1549.47	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	42	12.65	18.65	3.24	8.67	3.01	
GB	298	TRGB2_1	GB	526149.4	3481063.6	1550.44	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	43	12.95	18.95	3.24	8.82	3.01	
GB	299	TRGB2_2	GB	526154	3481049.6	1551.64	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	44	13.26	19.26	3.24	8.96	3.01	
GB	300	TRGB2_3	GB	526173.5	3481047	1553.59	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	45	13.56	19.56	3.24	9.10	3.01	
GB	301	TRGB2_4	GB	526190.4	3481052.7	1552.53	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	46	13.87	19.87	3.24	9.24	3.01	
GB	302	TRGB2_5	GB	526206.9	3481060	1552.49	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	47	14.17	20.17	3.24	9.38	3.01	
GB	303	TRGB2_6	GB	526219.4	3481072.3	1552.82	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	48	14.48	20.48	3.24	9.52	3.01	
GB	304	TRGB2_7	GB	526226.6	3481088.7	1553.22	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	49	14.78	20.78	3.24	9.67	3.01	
GB	305	TRGB2_8	GB	526235	3481104.3	1552.67	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	50	15.09	21.09	3.24	9.81	3.01	
GB	306	TRGB2_9	GB	526250.9	3481112.1	1552.69	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	51	15.39	21.39	3.24	9.95	3.01	
GB	307	TRGB2_10	GB	526268.6	3481115	1551.98	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	52	15.70	21.70	3.24	10.09	3.01	
GB	308	TRGB2_11	GB	526286.3	3481118.3	1553.13	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	53	16.00	22.00	3.24	10.23	3.01	
GB	309	TRGB2_12	GB	526304	3481121.4	1558.03	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	54	16.31	22.31	3.24	10.38	3.01	
GB	310	TRGB3_1	GB	526222.6	3481042.1	1561.69	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	55	16.61	22.61	3.24	10.52	3.01	
GB	311	TRGB3_2	GB	526235.1	3481055.1	1561.72	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	56	16.92	22.92	3.24	10.66	3.01	
GB	312	TRGB3_3	GB	526247.8	3481067.8	1562.26	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	57	17.22	23.22	3.24	10.80	3.01	
GB	313	TRGB3_4	GB	526263	3481076.9	1562.27	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	58	17.53	23.53	3.24	10.94	3.01	
GB	314	TRGB3_5	GB	526280	3481082.8	1562.2	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	59	17.83	23.83	3.24	11.08	3.01	
GB	315	TRGB3_6	GB	526296.7	3481089.4	1562.04	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	60	18.14	24.14	3.24	11.23	3.01	
GB	316	TRGB3_7	GB	526312.4	3481096.8	1562.13	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	61	18.44	24.44	3.24	11.37	3.01	
GB	317	TRGB3_8	GB	526315.8	3481113.6	1561.7	9.41E-03	9.41E-04	5.28E-04	8.93E-07	9.41E-03	9.41E-04	5.28E-04	8.93E-07	62	18.74	24.74	3.24	11.51	3.01	
LC	422																				

Mine Development  
Mod - Vol Road Params

JI	461	TRIJ_4	JI	525619.4	3480908.8	1594.88	2.80E-03	2.80E-04	8.04E-05	2.66E-07	2.80E-03	2.80E-04	8.04E-05	2.66E-07	40	12.19	18.19	3.09	8.46	2.88
IK	462	TRIK_1	IK	525648.2	3480855.9	1608.13	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	463	TRIK_2	IK	525630	3480855.5	1599.09	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	464	TRIK_3	IK	525614	3480846.9	1600.08	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	465	TRIK_4	IK	525598.1	3480838.2	1603.9	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	466	TRIK_5	IK	525587	3480823.8	1607.28	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	467	TRIK_6	IK	525576.1	3480809.2	1607.25	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	468	TRIK_7	IK	525565.1	3480794.7	1607.97	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	469	TRIK_8	IK	525554.2	3480780.2	1607.64	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	470	TRIK_9	IK	525550.8	3480764.2	1604.83	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	471	TRIK_10	IK	525555.9	3480746.8	1604.23	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	472	TRIK_11	IK	525569.4	3480735.4	1603.53	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	473	TRIK_12	IK	525584.4	3480725	1603.59	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	474	TRIK_13	IK	525599.3	3480714.7	1603.28	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	475	TRIK_14	IK	525615	3480706.3	1601.53	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	476	TRIK_15	IK	525633	3480703.8	1600.41	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	477	TRIK_16	IK	525651.1	3480701.3	1602.65	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	478	TRIK_17	IK	525669.1	3480698.8	1602.85	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IK	479	TRIK_18	IK	525687.1	3480696.3	1603.16	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IL	480	TRIL_19	IL	525705.1	3480693.7	1601.87	2.92E-03	2.92E-04	2.40E-04	2.77E-07	2.92E-03	2.92E-04	2.40E-04	2.77E-07	40	12.19	18.19	2.13	8.46	1.98
IL	481	TRIL_1	IL	525669.2	3480858	1610.82	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	482	TRIL_2	IL	525687.2	3480860.9	1609.74	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	483	TRIL_3	IL	525705.1	3480863.7	1603.06	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	484	TRIL_4	IL	525714	3480876.4	1601.52	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	485	TRIL_5	IL	525729.9	3480867.5	1601.64	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	486	TRIL_6	IL	525745.8	3480858.6	1600.77	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	487	TRIL_7	IL	525761.7	3480849.7	1599.8	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	488	TRIL_8	IL	525777.5	3480840.9	1600.86	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	489	TRIL_9	IL	525790.1	3480830.9	1603.66	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	490	TRIL_10	IL	525782.4	3480814.5	1605.93	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	491	TRIL_11	IL	525774.7	3480798	1607.92	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	492	TRIL_12	IL	525800.2	3480788.7	1607.71	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
IL	493	TRIL_13	IL	525800.5	3480776.8	1610.4	4.06E-03	4.06E-04	9.58E-05	3.86E-07	4.06E-03	4.06E-04	9.58E-05	3.86E-07	40	12.19	18.19	2.58	8.46	2.40
MT	494	TRMT_1	MT	526387	3481094.1	1560.71	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	495	TRMT_2	MT	526393.6	3481101	1554.69	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	496	TRMT_3	MT	526400.1	3481118	1550.63	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	497	TRMT_4	MT	526406.7	3481135	1546.36	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	498	TRMT_5	MT	526413.3	3481151.9	1546.32	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	499	TRMT_6	MT	526419.9	3481168.9	1548.73	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	500	TRMT_7	MT	526426.5	3481185.8	1553.4	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
MT	501	TRMT_8	MT	526433	3481202.8	1557.69	8.98E-04	8.98E-05	6.95E-05	8.53E-08	8.98E-04	8.98E-05	6.95E-05	8.53E-08	40	12.19	18.19	3.02	8.46	2.81
BP	502	TRBP_1	BP	526213	3481018.5	1562.57	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	503	TRBP_2	BP	526204	3481003.9	1562.81	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	504	TRBP_3	BP	526207.5	3480996.9	1562.35	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	505	TRBP_4	BP	526209.8	3480989.7	1561.38	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	506	TRBP_5	BP	526208.9	3480995.6	1559.58	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	507	TRBP_6	BP	526208	3480933.4	1558.11	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	508	TRBP_7	BP	526207	3480915.3	1556.56	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	509	TRBP_8	BP	526200.7	3480898.2	1554.9	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	510	TRBP_9	BP	526189.4	3480884.3	1553.15	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	511	TRBP_10	BP	526174.2	3480876.5	1552.15	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	512	TRBP_11	BP	526156.1	3480875	1551.23	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	513	TRBP_12	BP	526138.4	3480871.7	1549.76	2.59E-03	2.59E-04	1.58E-04	2.46E-07	2.59E-03	2.59E-04	1.58E-04	2.46E-07	40	12.19	18.19	2.39	8.46	2.22
BP	514	TRBP_13	BP	526123.1	3480862.8	1546.36	2.59													

Mine Development  
Mod - Vol Road Params

VX	552	CRVX_26	VX	527216.7	3480261.8	1604.14	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	553	CRVX_27	VX	527229.3	3480248.7	1610.85	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	554	CRVX_28	VX	527231	3480232	1611.73	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	555	CRVX_29	VX	527228.6	3480214	1609.9	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	556	CRVX_30	VX	527226.3	3480195.9	1605.36	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	557	CRVX_31	VX	527224	3480177.9	1599.88	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	558	CRVX_32	VX	527221.9	3480159.9	1593.12	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	559	CRVX_33	VX	527219.3	3480141.8	1588.46	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	560	CRVX_34	VX	527216.9	3480123.8	1590.74	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
VX	561	CRVX_35	VX	527214.6	3480105.7	1594.31	3.98E-03	3.98E-04	2.67E-04	3.78E-07	3.98E-03	3.98E-04	2.67E-04	3.78E-07	40	12.19	18.19	2.41	8.46	2.24
YA	562	CRYA_1	YA	527335.1	3480572.9	1588.85	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	563	CRYA_2	YA	527334.3	3480591	1592.44	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	564	CRYA_3	YA	527332.6	3480609.1	1597.14	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	565	CRYA_4	YA	527328.9	3480626.4	1601.14	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	566	CRYA_5	YA	527317.1	3480640.2	1601.19	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	567	CRYA_6	YA	527301.2	3480648.5	1598.78	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	568	CRYA_7	YA	527284.1	3480654.3	1594.96	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	569	CRYA_8	YA	527266.1	3480657.2	1589.52	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	570	CRYA_9	YA	527248.1	3480659.2	1583.96	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	571	CRYA_10	YA	527230.8	3480667.3	1583.12	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	572	CRYA_11	YA	527214.7	3480672.3	1580.5	7.60E-04	7.60E-05	6.21E-05	7.22E-08	7.60E-04	7.60E-05	6.21E-05	7.22E-08	40	12.19	18.19	#N/A	8.46	#N/A
WX	573	CRWX_1	WX	527254	3480558.1	1584.96	1.31E-03	1.31E-04	1.01E-04	1.24E-07	1.31E-03	1.31E-04	1.01E-04	1.24E-07	20	6.10	12.10	3.02	5.63	2.81
WX	574	CRWX_2	WX	527258.9	3480547.1	1586.91	1.31E-03	1.31E-04	1.01E-04	1.24E-07	1.31E-03	1.31E-04	1.01E-04	1.24E-07	20	6.10	12.10	3.02	5.63	2.81
WX	575	CRWX_3	WX	527265.4	3480537	1588.25	1.31E-03	1.31E-04	1.01E-04	1.24E-07	1.31E-03	1.31E-04	1.01E-04	1.24E-07	20	6.10	12.10	3.02	5.63	2.81
WX	576	CRWX_4	WX	527276.1	3480531.4	1589.08	1.31E-03	1.31E-04	1.01E-04	1.24E-07	1.31E-03	1.31E-04	1.01E-04	1.24E-07	20	6.10	12.10	3.02	5.63	2.81
WX	577	CRWX_5	WX	527287.2	3480527	1591.22	1.31E-03	1.31E-04	1.01E-04	1.24E-07	1.31E-03	1.31E-04	1.01E-04	1.24E-07	20	6.10	12.10	3.02	5.63	2.81
WX	578	CRWX_6	WX	527299.1	3480524.5	1594.28	1.31E-03	1.31E-04	1.01E-04	1.24E-07	1.31E-03	1.31E-04	1.01E-04	1.24E-07	20	6.10	12.10	3.02	5.63	2.81
XB	579	CRXB_1	XB	527305.5	3480513.2	1598.7	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	580	CRXB_2	XB	527305.5	3480501.1	1601.29	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	581	CRXB_3	XB	527303.7	3480489.5	1602.64	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	582	CRXB_4	XB	527293.6	3480484.5	1600.29	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	583	CRXB_5	XB	527281.9	3480481.6	1602.14	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	584	CRXB_6	XB	527273.3	3480492.2	1601.42	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	585	CRXB_7	XB	527264.8	3480500.7	1600.44	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	586	CRXB_8	XB	527256.2	3480509.3	1599.77	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	587	CRXB_9	XB	527247.1	3480517.2	1599.36	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	588	CRXB_10	XB	527237.2	3480524	1599.95	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	589	CRXB_11	XB	527227	3480530.5	1600.69	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	590	CRXB_12	XB	527215	3480531.6	1603.61	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	591	CRXB_13	XB	527202.9	3480532.6	1604.37	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	592	CRXB_14	XB	527191.2	3480535.3	1603.64	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	593	CRXB_15	XB	527179.4	3480538.3	1603.29	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	594	CRXB_16	XB	527167.7	3480541.2	1603.22	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	595	CRXB_17	XB	527156	3480544.2	1602.26	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	596	CRXB_18	XB	527144.2	3480547.2	1601.36	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	597	CRXB_19	XB	527132.5	3480550.1	1600.77	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	598	CRXB_20	XB	527120.8	3480553.1	1600.14	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	599	CRXB_21	XB	527108.7	3480554.3	1600.23	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	600	CRXB_22	XB	527102.1	3480547.2	1601.36	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	601	CRXB_23	XB	527105.1	3480537.3	1603.21	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	602	CRXB_24	XB	527115.1	3480530.4	1605.59	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	603	CRXB_25	XB	527126.3	3480526.1	1607.4	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	604	CRXB_26	XB	527137.7	3480522	1609.15	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6.00E-04	6.00E-05	4.58E-05	5.69E-08	20	6.10	12.10	2.99	5.63	2.78
XB	605	CRXB_27	XB	527149.4	3480519	1609.92	6.00E-04	6.00E-05	4.58E-05	5.69E-08	6									



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BZ	643	CRBZ_20	BZ	527381.2	3480351.7	1646.52	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	644	CRBZ_21	BZ	527369.1	3480351.7	1647.9	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	645	CRBZ_22	BZ	527357.1	3480350.3	1649.83	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	646	CRBZ_23	BZ	527347	3480345.5	1653.02	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	647	CRBZ_24	BZ	527344.2	3480335.1	1656.11	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	648	CRBZ_25	BZ	527350.8	3480325.5	1658.04	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	649	CRBZ_26	BZ	527362	3480321.9	1658.16	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	650	CRBZ_27	BZ	527373.5	3480318.4	1657.99	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	651	CRBZ_28	BZ	527385.4	3480316.8	1657.06	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	652	CRBZ_29	BZ	527397.4	3480315.2	1656.13	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	653	CRBZ_30	BZ	527408.5	3480311.5	1656.14	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	654	CRBZ_31	BZ	527417.6	3480303.6	1657.51	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	655	CRBZ_32	BZ	527424.3	3480294	1659.22	5.15E-04	5.15E-05	4.13E-05	4.89E-08	5.15E-04	5.15E-05	4.13E-05	4.89E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	656	CRBZ_33	BZ	527427.5	3480282.4	1661.17	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	657	CRBZ_34	BZ	527427.4	3480270.3	1663.36	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	658	CRBZ_35	BZ	527427.3	3480258.2	1665.36	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	659	CRBZ_36	BZ	527427.2	3480246.1	1667.27	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	660	CRBZ_37	BZ	527427.1	3480234	1669.17	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	661	CRBZ_38	BZ	527427	3480223.9	1670.62	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	662	CRBZ_39	BZ	527427	3480209.8	1671.78	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	663	CRBZ_40	BZ	527426.9	3480197.7	1672.72	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	664	CRBZ_41	BZ	527426.8	3480185.6	1673.28	5.15E-04	5.15E-05	4.13E-05	4.89E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
ZA	665	CRZA_1	ZA	527419.8	3480177.2	1674.31	6.33E-04	6.33E-05	5.08E-05	6.01E-08	6.33E-04	6.33E-05	5.08E-05	6.01E-08	20	6.10	12.10	3.10	5.63	2.94	
ZA	666	CRZA_2	ZA	527407.7	3480177.2	1675.46	6.33E-04	6.33E-05	5.08E-05	6.01E-08	6.33E-04	6.33E-05	5.08E-05	6.01E-08	20	6.10	12.10	3.10	5.63	2.94	
VC	667	CRVC_1	VC	526826.1	3480827.6	1542.04	8.30E-04	8.30E-05	6.28E-05	7.88E-08	8.30E-04	8.30E-05	6.28E-05	7.88E-08	40	12.19	18.19	2.96	8.46	2.96	
TV	668	TRTV_1	TV	526374.8	3480832.1	1536.54	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	669	TRTV_2	TV	526366.9	3480815.7	1539.59	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	670	TRTV_3	TV	526359.1	3480799.3	1540.93	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	671	TRTV_4	TV	526351.7	3480782.6	1539.45	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	672	TRTV_5	TV	526343	3480766.9	1532.47	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	673	TRTV_6	TV	526331.8	3480752.5	1530.29	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	674	TRTV_7	TV	526319.4	3480738.2	1533.21	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	675	TRTV_8	TV	526309.4	3480723.8	1541.83	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	676	TRTV_9	TV	526293.3	3480711.3	1548.89	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	677	TRTV_10	TV	526275.3	3480723.5	1547	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	678	TRTV_11	TV	526257.4	3480726.6	1550.75	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	679	TRTV_12	TV	526239.6	3480730.5	1554.16	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	680	TRTV_13	TV	526221.4	3480731.8	1557.84	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	681	TRTV_14	TV	526206.9	3480724	1564.46	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	682	TRTV_15	TV	526202.1	3480706.4	1567.08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	683	TRTV_16	TV	526200.2	3480688.6	1570.13	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	684	TRTV_17	TV	526213.4	3480679.4	1574.88	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	685	TRTV_18	TV	526227.8	3480668.9	1578.9	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	686	TRTV_19	TV	526240.8	3480655.1	1581.77	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	687	TRTV_20	TV	526253.7	3480645.4	1584.03	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	688	TRTV_21	TV	526262.8	3480628.6	1588.69	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	689	TRTV_22	TV	526265.9	3480610.6	1594.1	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	690	TRTV_23	TV	526266.8	3480592.5	1598.76	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	691	TRTV_24	TV	526267.3	3480574.3	1602.51	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
TV	692	TRTV_25	TV	526260.5	3480557.8	1602.12	8.21E-04	8.21E-05	6.81E-05	7.79E-08	8.21E-04	8.21E-05	6.81E-05	7.79E-08	40	12.19	18.19	3.11	8.46	2.89	
VA	693	CRVA_1	VA	526845.8	3480673.9	1553.4	8.99E-04	8.99E-05	7.35E-05	8.54E-08	8.99E-04	8.99E-05	7.35E-05	8.54E-08	40	12.19	18.19	3.05	8.46	2.84	
VA	694	CRVA_2	VA	526845.8	3480655.7	1555.59	8.99E-04	8.99E-05	7.35E-05	8.54E-08	8.99E-04	8.99E-05	7.35E-05	8.54E-08	40	12.19	18.19	3.05	8.46	2.84	
VA	695																				

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TP	734	TRTP_4	TP	526344.4	3480809.1	1530.57	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA24
TP	735	TRTP_5	TP	526334.3	3480797	1529.99	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA24
TP	736	TRTP_6	TP	526324.2	3480785	1528.67	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA24
TP	737	TRTP_7	TP	526314.1	3480772.9	1529.41	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA24
TP	738	TRTP_8	TP	526300.3	3480766.2	1530.18	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA25
TP	739	TRTP_9	TP	526284.6	3480765.2	1530.61	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA25
TP	740	TRTP_10	TP	526271.2	3480774.1	1531.05	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA25
TP	741	TRTP_11	TP	526258.1	3480782.8	1531.82	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA26
TP	742	TRTP_12	TP	526245.3	3480792.1	1532.43	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA26
TP	743	TRTP_13	TP	526232.5	3480801.3	1532.89	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA26
TP	744	TRTP_14	TP	526219.8	3480810.5	1533.53	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA26
TP	745	TRTP_15	TP	526207	3480819.7	1534.57	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA26
TP	746	TRTP_16	TP	526192.5	3480825.4	1535.53	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA26
TP	747	TRTP_17	TP	526177	3480823.9	1536.33	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA27
TP	748	TRTP_18	TP	526162.5	3480818.5	1537.11	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA27
TP	749	TRTP_19	TP	526149.2	3480810.1	1537.66	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA27
TP	750	TRTP_20	TP	526134.4	3480807.3	1540.11	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA27
TP	751	TRTP_21	TP	526119.2	3480810.6	1542.51	2.15E-03	2.15E-04	1.31E-04	2.05E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.39	7.33	2.22	CRAREA27
DP	752	TROP_1	DP	526117.1	3480795.9	1542.92	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA28
DP	753	TROP_2	DP	526113.9	3480781.6	1541.79	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA28
DP	754	TROP_3	DP	526102.5	3480770.9	1542.68	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA28
DP	755	TROP_4	DP	526090.2	3480761	1543.95	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA28
DP	756	TROP_5	DP	526077.9	3480751.1	1546.32	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA28
DP	757	TROP_6	DP	526064.5	3480743.4	1549.84	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA29
DP	758	TROP_7	DP	526049.3	3480739.2	1549.07	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA29
DP	759	TROP_8	DP	526033.9	3480735.9	1547.76	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA29
DP	760	TROP_9	DP	526021.2	3480727.4	1547.87	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	761	TROP_10	DP	526014.8	3480713.5	1548.3	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	762	TROP_11	DP	526012.2	3480698	1548.74	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	763	TROP_12	DP	526011.3	3480682.3	1548.8	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	764	TROP_13	DP	526011	3480666.6	1548.93	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	765	TROP_14	DP	526010.8	3480650.8	1549.93	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	766	TROP_15	DP	526010.5	3480635.1	1551.02	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA30
DP	767	TROP_16	DP	526014	3480619.7	1551.51	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	768	TROP_17	DP	526018.2	3480604.6	1551.34	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	769	TROP_18	DP	526017.4	3480588.8	1550.3	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	770	TROP_19	DP	526010.9	3480574.6	1549.68	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	771	TROP_20	DP	526000.3	3480563	1551.23	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	772	TROP_21	DP	525989.6	3480551.3	1552.73	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	773	TROP_22	DP	525979	3480539.7	1553.32	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	774	TROP_23	DP	525968.4	3480528.1	1554.67	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	775	TROP_24	DP	525957.7	3480516.5	1554.57	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	776	TROP_25	DP	525947.1	3480504.8	1554.08	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA31
DP	777	TROP_26	DP	525939.7	3480491.3	1557.13	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA32
DP	778	TROP_27	DP	525925.4	3480484.8	1556	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA32
DP	779	TROP_28	DP	525911.1	3480478.2	1555.31	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA32
DP	780	TROP_29	DP	525896.7	3480471.7	1554.28	6.47E-04	6.47E-05	5.37E-05	6.14E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.11	7.33	2.89	CRAREA32
OP	781	TROP_1	OP	525737.6	3481435.4	1535.95	6.29E-04	6.29E-05	4.57E-05	5.98E-08	6.29E-04	6.29E-05	4.57E-05	5.98E-08	20	6.10	12.10	3.04	5.63	2.83	
OP	782	TROP_2	OP	525733.3	3481446.7	1535.15	6.29E-04	6.29E-05	4.57E-05	5.98E-08	6.29E-04	6.29E-05	4.57E-05	5.98E-08	20	6.10	12.10	3.04	5.63	2.83	
OP	783	TROP_3	OP	525728.9	3481458	1536.32	6.29E-04	6.29E-05	4.57E-05	5.98E-08	6.29E-04	6.29E-05	4.57E-05	5.98E-08	20	6.10	12.10	3.04	5.63	2.83	
OP	784	TROP_4	OP	525724.6	3481469.3	1536.83	6.29E-04	6.29E-05	4.57E-05	5.98E-08	6.29E-04	6.29E-05	4.57E-05	5.98E-08	20	6.10	12.10	3.04	5.63	2.83	
OP	785	TROP_5	OP	525720.2	3481480.6	1537.15	6.29E-04	6.29E-05	4.57E-05	5.9											

**Mine Development  
Plan II Modeling**

Mine Development  
Point Sources

Table A-1. South32 Hermosa Point Sources

Source ID	Description	From BREEZE Model					Short Term Emission Rate					Long Term Emission Rate		Stk Ht (m)	Stk Temp (K)	Stk Vel (m/s)	Stk Diam (m)	
		UTMx	UTMy	Elev (m)		Monthly	annual	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	NO <sub>x</sub>	CO	PM <sub>2.5</sub>					NO <sub>x</sub>
				1/8-hr	24-hr													
CT1	Cooling Tower Cell 1	526030.8	3481014.7	1572.77	1572.77	1572.77	1572.77	1.93E-04	6.73E-05						15.00	0.00	93.69	5.00
CT2	Cooling Tower Cell 2	526042.3	3481025.8	1572.77	1572.77	1572.77	1572.77	1.93E-04	6.73E-05						15.00	0.00	93.69	5.00
CT3	Cooling Tower Cell 3	526053.3	3481036.6	1572.77	1572.77	1572.77	1572.77	1.93E-04	6.73E-05						15.00	0.00	93.69	5.00
CT4	Cooling Tower Cell 4	526063.7	3481046.5	1572.77	1572.77	1572.77	1572.77	1.93E-04	6.73E-05						15.00	0.00	93.69	5.00
WTP2CT1	WTP2 CT Cell 1	526383.5	3481244.8	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT2	WTP2 CT Cell 2	526384.4	3481248.5	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT3	WTP2 CT Cell 3	526385.6	3481252.0	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT4	WTP2 CT Cell 4	526386.7	3481255.4	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT5	WTP2 CT Cell 5	526387.8	3481259.0	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT6	WTP2 CT Cell 6	526389.0	3481262.7	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT7	WTP2 CT Cell 7	526390.3	3481266.0	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
WTP2CT8	WTP2 CT Cell 8	526391.1	3481269.5	1559.05	1559.05	1559.05	1559.05	7.34E-05	1.46E-06			1.46E-06			6.41	0.00	93.69	2.74
CT7	UG Refrigeration CT Cell 1	526356.0	3480742.7	1540.79	1540.79	1540.79	1540.79	2.85E-04	9.92E-05			9.92E-05			15.00	0.00	93.69	5.00
CT8	UG Refrigeration CT Cell 2	526352.9	3480737.2	1541.08	1541.08	1541.08	1541.08	2.85E-04	9.92E-05			9.92E-05			15.00	0.00	93.69	5.00
CT9	UG Refrigeration CT Cell 3	526349.8	3480731.7	1541.59	1541.59	1541.59	1541.59	2.85E-04	9.92E-05			9.92E-05			15.00	0.00	93.69	5.00
CT10	UG Refrigeration CT Cell 4	526346.8	3480726.9	1542.00	1542.00	1542.00	1542.00	2.85E-04	9.92E-05			9.92E-05			15.00	0.00	93.69	5.00
VRT_1	Vent Raise - Taylor	526380.4	3480755.6	1550.56	1550.56	1550.56	1550.56	9.34E-02	1.25E-02	1.81E-04	1.46E-01	7.89E+00	9.55E-03	4.31E-03	13.00	296.95	11.47	4.28
VRT_2	Vent Raise - Taylor	526361.5	3480762.0	1545.06	1545.06	1545.06	1545.06	9.34E-02	1.25E-02	1.81E-04	1.46E-01	7.89E+00	9.55E-03	4.31E-03	13.00	296.95	11.47	4.28
VRT1_1	Ventilation Shaft - Taylor	526141.6	3480984.3	1573.32	1573.32	1573.32	1573.32	2.63E-01	3.45E-02	4.98E-04	4.02E-01	2.17E+01	2.63E-02	1.19E-02	13.00	293.85	21.37	5.21
VRT1_2	Ventilation Shaft - Taylor	526133.6	3481001.5	1570.59	1570.59	1570.59	1570.59	2.63E-01	3.45E-02	4.98E-04	4.02E-01	2.17E+01	2.63E-02	1.19E-02	13.00	293.85	21.37	5.21
DC-1	21300-DCD-001	525957.6	3481020.7	1573.32	1573.32	1573.32	1573.32	6.91E-03	6.91E-03	3.43E-04					8.23	0.00	15.21	0.36
DC-2	21300-DCD-002	525946.8	3481009.8	1570.39	1575.46	1575.46	1575.46	1.03E-02	1.03E-02	5.09E-04					37.80	0.00	13.65	0.46
DC-3	21300-DCD-003	525840.3	3480779.7	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04					27.43	0.00	13.66	0.38
DC-4	21300-DCD-004	525866.7	3480779.1	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04					27.43	0.00	13.66	0.38
DC-5	21300-DCD-005	525860.1	3480760.8	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04					27.43	0.00	13.66	0.38
DC-6	21300-DCD-006	525844.7	3480756.5	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04					27.43	0.00	13.66	0.38
DC-7	Coarse Ore Dust Collection System, 23100-DCD-001 #1	526842.0	3480691.4	1550.70	1550.70	1550.70	1550.70	3.46E-03	3.46E-03	6.08E-05					5.49	0.00	13.21	0.58
DC-8	Coarse Ore Dust Collection System, 23100-DCD-005 #2	526813.3	3480714.4	1552.40	1552.40	1552.40	1552.40	3.46E-03	3.46E-03	6.08E-05					5.49	0.00	13.21	0.58
DC-10	Coarse Ore Dust Collection System, 23100-DCD-002 #3	526808.2	3480714.4	1552.75	1552.75	1552.75	1552.75	3.46E-03	3.46E-03	6.08E-05					5.49	0.00	13.21	0.58
DC-11	21300-DCD-005 Coarse Ore Silo Collection System collecting dust from entrance to 21500-SLO-004 Coarse Ore Silo No. 4	525849.1	3480796.7	1602.33	1602.33	1602.33	1602.33	7.13E-03	7.13E-03	3.54E-04					27.43	0.00	13.66	0.38
VRHS1_1	Ventilation - Exhaust Raises NE Hardshell #1	527359.8	3480617.4	1604.25	1604.25	1604.25	1604.25	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS1_2	Ventilation - Exhaust Raises NE Hardshell #1	527359.8	3480627.4	1605.45	1605.45	1605.45	1605.45	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS2_1	Ventilation - Exhaust Raises NE Hardshell #2	527370.6	3480626.0	1603.13	1603.13	1603.13	1603.13	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS2_2	Ventilation - Exhaust Raises NE Hardshell #2	527370.6	3480636.0	1603.67	1603.67	1603.67	1603.67	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS3_1	Ventilation - Exhaust Raise SE Hardshell	527406.0	3479986.0	1661.92	1661.92	1661.92	1661.92	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
VRHS3_2	Ventilation - Exhaust Raise SE Hardshell	527406.0	3479986.0	1667.17	1667.17	1667.17	1667.17	1.22E-01	1.24E-02	4.10E-05	4.83E-02	2.61E+00	1.03E-02	6.74E-04	13.00	307.59	15.88	2.75
ENG5	CUMMINS POWER GENERATION C200D2RE	527018.4	3480627.4	1560.52	1560.52	1560.52	1560.52	1.21E-03	1.21E-03		2.42E-02	1.21E-01	1.21E-03	2.42E-02	1.80	726.15	0.07	0.10
ENG9	CAT C175 Substation 1	525791.0	3480726.0	1609.17	1609.17	1609.17	1609.17	3.67E-02	3.67E-02	3.21E+00	3.21E+00	3.67E-02	3.21E+00	3.67E-02	2.23	745.45	12.09	0.61
ENG10	CAT C175 Substation 2	525796.0	3480722.0	1609.01	1609.01	1609.01	1609.01	3.67E-02	3.67E-02	3.21E+00	3.21E+00	3.67E-02	3.21E+00	3.67E-02	2.23	745.45	12.09	0.61
ENG11	CAT C175 Substation 3	525785.0	3480720.0	1609.52	1609.52	1609.52	1609.52	3.67E-02	3.67E-02	3.21E+00	3.21E+00	3.67E-02	3.21E+00	3.67E-02	2.23	745.45	12.09	0.61
ENG12	CAT C175 Shaft 1	526093.0	3480998.0	1573.87	1573.87	1573.87	1573.87	3.67E-02	3.67E-02	3.21E+00	3.21E+00	3.67E-02	3.21E+00	3.67E-02	2.23	745.45	12.09	0.61
ENG13	CAT C175 Shaft 2	526095.0	3480995.0	1573.56	1573.56	1573.56	1573.56	3.67E-02	3.67E-02	3.21E+00	3.21E+00	3.67E-02	3.21E+00	3.67E-02	2.23	745.45	12.09	0.61
75TNG1	NG Trenc 75%	525754.9	3480877.4	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG2	NG Trenc 75%	525763.2	3480878.8	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG3	NG Trenc 75%	525771.1	3480879.1	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG4	NG Trenc 75%	525778.8	3480886.3	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG5	NG Trenc 75%	525786.4	3480863	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG6	NG Trenc 75%	525794.3	3480859.6	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG7	NG Trenc 75%	525801.7	3480856	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG8	NG Trenc 75%	525810	3480852.3	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG9	NG Trenc 75%	525817.5	3480848.0	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG10	NG Trenc 75%	525824.3	3480845.2	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG11	NG Trenc 75%	525831.7	3480841.6	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG12	NG Trenc 75%	525840	3480837.9	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG13	NG Trenc 75%	525847.5	3480834.2	1591.06	1581.91	1581.91	1581.91	1.71E-02	1.71E-02	4.07E-02	1.46E-02	1.71E-02	4.07E-02	1.71E-02	5.58	761.02	4.68	0.81
75TNG14	NG Trenc 75%	525854.8	3480830.6	1591.06	1581.91													



**Mine Development  
Horz point**

**Table A-2. South32 Hermosa Horizontal Point Sources**

Source ID	Material	Description	From BREEZE Model			Short Term Emission Rate (g/s)			Long Term Emission Rate (g/s)	Stk Ht (m)	Stk Temp (K)	Stk Vel (m/s)	Stk Diam (m)
			UTMx	UTMy	Elev (m)	PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	PM <sub>2.5</sub>				
<b>Taylor</b>													
DCCBP	Cement	CBP Cement Silo	525974.0	3481133.8	1577.88	2.40E-05	2.40E-05	0.00E+00	2.40E-05	10.7	0.00	4.00	0.3
DCCBPS	Cement	CBP Cement Supplement Silo	525979.6	3481135.6	1577.70	5.15E-05	5.15E-05	0.00E+00	5.15E-05	10.7	0.00	4.00	0.3
DCCPPBS1	Binder	Paste Plant Binder Silo 1	526438.3	3481085.1	1554.48	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.3
DCCPPBS2	Binder	Paste Plant Binder Silo 2	526440.6	3481079.4	1554.48	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.3
DCCPPBS3	Binder	Paste Plant Binder Silo 3	526441.9	3481073.8	1554.48	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.3
DCCPPBS4	Binder	Paste Plant Binder Silo 4	526443.0	3481068.9	1554.48	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.3
DCCPPM1M	Binder	Plant Plant Module 1 Mixer	526444.7	3481063.0	1554.48	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.3
DCCPPM2M	Binder	Plant Plant Module 2 Mixer	526446.2	3481058.1	1554.48	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.3
WTP1LS	Lime	Waste Water Treatment Plant #1 Lime Silo	525788.3	3481926.3	1503.73	5.40E-03	5.40E-03	0.00E+00	5.40E-03	6.4	0.00	4.00	0.3
<b>Clark</b>													
DCCCBP	Cement	CBP Cement Silo	527166.30	3480484.30	1620.27	1.18E-06	1.18E-06	0.00E+00	1.18E-06	10.7	0.00	4.00	0.3
DCCCBPS	Cement	CBP Cement Supplement Silo	527166.30	3480484.30	1620.27	1.71E-05	1.71E-05	0.00E+00	1.71E-05	10.7	0.00	4.00	0.3
DCCPPBS1	Binder	Paste Plant Binder Silo 1	527318.3	3480489.5	1606.44	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.3
DCCPPBS2	Binder	Paste Plant Binder Silo 2	527319.5	3480485.3	1607.59	4.05E-03	4.05E-03	0.00E+00	4.05E-03	10.7	0.00	4.00	0.3
DCCPPBS3	Binder	Paste Plant Binder Silo 3	527321	3480480.7	1608.98	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.3
DCCPPBS4	Binder	Paste Plant Binder Silo 4	527322.5	3480475.7	1610.21	8.10E-03	8.10E-03	0.00E+00	8.10E-03	10.7	0.00	4.00	0.3
DCCPPM1M	Binder	Plant Plant Module 1 Mixer	527324	3480472.4	1611.26	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.3
DCCPPM2M	Binder	Plant Plant Module 2 Mixer	527325.5	3480467.5	1612.33	1.62E-02	1.62E-02	0.00E+00	1.62E-02	10.7	0.00	4.00	0.3

Mine Development  
Area Sources

Table A-3. South32 Hermosa Area Sources

Type of Pile	Source ID	Description	From BREEZE Model						Short Term Emission Rate (g/s/m2)			Long Term Emission Rate (g/s/m2)		Rel Ht (m)	Xlength (m)	Ylength (m)	Angle	Init vert dim	Area (sq. ft)	Area (m2)
			UTMx	UTMy	Elev (m)			PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	PM <sub>2.5</sub>									
					24-hr	monthly	annual					24 hour	24 hour							
Polygon	TSF2	USFS Tailings Storage Facility	526570	3481808.6	1534.16	1534.16	1534.16	1.18E-06	1.77E-07	9.43E-09	1.77E-07	4.57	POLYGON			2.13	5,317,757.09	494,035.59		
Polygon	TSF_3	Tailing Storage Facility	525820.0	3481442.1	1584.96	1584.96	1584.96	1.38E-06	2.07E-07	1.11E-08	2.07E-07	4.57	POLYGON			2.13	2,535,243.20	200,851.20		
Polygon	WRS	West Rock Stockpile	525625.8	3480953.2	1595.12	1590.04	1590.04	3.73E-07	5.59E-08	2.64E-09	5.59E-08	4.57	POLYGON			2.13	297,598.55	27,647.80		
Polygon	ERS	East Rock Stockpile	525787.7	3480958.7	1581.91	1581.91	1581.91	3.73E-07	5.59E-08	2.64E-09	5.59E-08	4.57	POLYGON			2.13	329,656.92	30,626.12		
Polygon	HRS	Hardshell Rock Stockpile	526991.6	3480492.9	1623.06	1600.20	1600.20	3.74E-07	5.61E-08	2.65E-09	5.61E-08	4.57	POLYGON			2.13	1,138,607.52	105,524.10		
Circular	ROM	Clark ROM Stockpile	526856.2	3480646.2	1559.60			3.73E-07	5.59E-08	1.31E-08	5.59E-08	3.05	RADIUS->	20.95	20.00	1.42	14,839.60	1,378.64		
Rectangular	ORE	Clark Ore Stockpile	527205.0	3480657.0	1571.71			3.73E-07	5.59E-08	1.31E-08	5.59E-08	3.05	60.96	76.20	110.00	1.42	50,000.52	4,645.20		
Rectangular	AGG	Clark Agg Stockpile	527186.9	3480489.4	1619.40			7.80E-08	1.17E-08		1.17E-08	3.05	18.29	4.57	110.00	1.42	899.86	83.60		
Rectangular	SHOT	Clark Shotcrete Stockpile	527165.6	3480481.1	1620.82			7.80E-08	1.17E-08		1.17E-08	3.05	12.19	12.19	-10.00	1.42	1,599.52	148.60		
Rectangular	TAGG	Taylor Agg Stockpile	525986.5	3481131.9	1577.89			7.80E-08	1.17E-08		1.17E-08	3.05	18.29	4.57	110.00	1.42	899.86	83.60		
Rectangular	TSHOT	Taylor Shotcrete Stockpile	525998.4	3481132.9	1575.48			7.80E-08	1.17E-08		1.17E-08	3.05	12.19	12.19	-10.00	1.42	1,599.52	148.60		

**Mine Development  
Volume Sources**

**Table A-4. South32 Hermosa Volume Sources**

Source ID	Description	From BREEZE Model					Short Term Emission Rate (g/s)			Long Term Emission Rate (g/s)	Source Vertical Dimension (m)	Source Width (m)	Rel Ht (m)	Init Lat Dim	Init Vert. Dim
		UTMx	UTMy	Elev (m)			PM <sub>10</sub>	PM <sub>2.5</sub>	Lead	PM <sub>2.5</sub>					
				24-hr	monthly	annual									
<b>Taylor</b>															
DP1	Drop of the crushed ore from the mine to the 21200-BIN-001 Mine Shaft Ore Bin	525971.2	3480990.7	1573.07	1573.07	1573.07	3.17E-02	4.81E-03	2.90E-03	4.09E-03	-	2.00	24.92	0.47	3.06
DP2	Drop from 21200-BIN-001 Mine Shaft Ore Bin to 21200-FOR-001 Mine Shaft Ore Discharge Feeder	525971.2	3480990.7	1573.07	1573.07	1573.07	3.17E-02	4.81E-03	2.90E-03	4.09E-03	-	2.00	6.40	0.47	0.85
DP18	Drop from 21710-CV-00001 Primary Mill Feed Conveyor to 22100-CH-00001 Primary Mill Feed Chute	525704.7	3480821.2	1603.248			4.01E-02	6.08E-03	3.55E-03	4.09E-03	-	2.25	10.73	0.52	0.46
DP21		525705.9	3480834	1603.248			2.07E-02	3.13E-03	5.60E-04	2.67E-03	-	-	1.78	0.43	0.83
DP82	Drop on West NAG Stockpile	525582.2	3480891.9	1595.12	1590.04	1590.04	4.33E-03	6.56E-04	3.24E-05	6.56E-04	7.07	3.43	0.70	0.80	3.29
DP83	Drop on East NAG Stockpile	525809.7	3480893.4	1581.91	1581.91	1581.91	4.80E-03	7.27E-04	3.59E-05	7.27E-04	7.07	3.43	0.70	0.80	3.29
DP84	TSF	525986.2	3481278.7	1584.96	1584.96	1584.96	8.96E-03	1.36E-03	7.57E-05	1.36E-03	7.07	3.43	0.70	0.80	3.29
DP85	Drops on TSF2	526795.7	3482181.6	1534.16	1534.16	1534.16	1.88E-02	2.84E-03	1.59E-04	2.84E-03	7.07	3.43	0.70	0.80	3.29
DP94	Transfer from Agg Stockpile to Loader	525985.7	3481122.8	1571.07			9.02E-03	1.37E-03	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16
DP95	Transfer of Agg Material from Loader to Haul Truck	525985.7	3481122.8	1571.07			9.02E-03	1.37E-03	0.00E+00	1.70E-04	3.75	2.04	0.89	0.47	0.87
DP96	Transfer of Shotcrete Aggregate from Stockpile to Loader	526003.3	3481140.2	1569.67			6.31E-03	9.56E-04	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16
CBP1_11	CBP Plant	525975.4	3481139.1	1577.31			8.15E-03	8.15E-03	0.00E+00	8.15E-03	-	-	2.40	4.52	2.23
CRUSH2	Pebble Crushing	525822.7	3480776.7	1602.33			1.60E-01	2.47E-02	3.94E-03	2.14E-02	-	-	13.72	2	12.76
DPWTP2	WTP2 Reagent Drops inside bldg	526396.80	3481207.50	1561.01			1.72E-05	2.61E-06	0.00E+00	2.61E-06	-	-	0.70	0.80	1.74
DOZTSF21	TSF2 dozer 1	527114.2	3481856.3	1534.16	1534.16	1534.16	6.01E-02	2.97E-02	1.13E-03	2.97E-02	-	-	1.75	0.96	0.94
DOZTSF22	TSF2 dozer 2	527116.3	3481855.4	1534.16	1534.16	1534.16	6.01E-02	2.97E-02	1.13E-03	2.97E-02	-	-	1.75	0.96	0.94
DOZTSF3	Dozer on TSF 3	526145.0	3481450.0	1584.96	1584.96	1584.96	6.01E-02	2.97E-02	1.13E-03	2.97E-02	-	-	1.75	0.96	0.94
DOZWRS	Dozer on West Rock Stockpile	525526	3480957.5	1595.12	1590.04	1590.04	4.12E-03	3.28E-03	1.11E-04	3.28E-03	-	-	1.75	0.96	0.94
DOZERS	Dozer on East Rock Stockpile	525990.5	3480890.1	1581.91	1581.91	1581.91	4.12E-03	3.28E-03	1.11E-04	3.28E-03	-	-	1.75	0.96	0.94
MEVAP1	Mechanical Evaporator 1	525908.5	3481579	1513.31		1513.31	6.82E-03	1.02E-03	0.00E+00	1.71E-04	-	-	5.33	5.01	2.48
MEVAP2	Mechanical Evaporator 2	525917.9	3481642.2	1512.68		1512.68	6.82E-03	1.02E-03	0.00E+00	1.71E-04	-	-	5.33	5.01	2.48
MEVAP3	Mechanical Evaporator 3	525853.4	3481615.7	1511.22		1511.22	6.82E-03	1.02E-03	0.00E+00	1.71E-04	-	-	5.33	5.01	2.48
PP1	Truck Pneumatic Loadout to Silo 1	526439.8	3481085.70	1551.77		1551.77	4.19E-04	8.74E-05	0.00E+00	8.74E-05	-	-	2.00	1.16	4.98
PP2	Truck Pneumatic Loadout to Silo 2	526442.2	3481079.90	1551.73		1551.73	4.19E-04	8.74E-05	0.00E+00	8.74E-05	-	-	2.00	1.16	4.98
<b>Clark</b>															
DP103	Haul Truck Dump into Primary Crusher Feed Hopper from ROM Stockpile (23100-HPR-0001)	526837.8	3480679.9	1554.48			6.06E-03	9.18E-04	1.51E-04	5.96E-04	3.75	3.43	3.92	0.80	1.74
DP104	Drop from silo to trucks	526810.7	3480704.9	1554.48			1.41E-02	2.14E-03	5.02E-04	1.99E-03	-	-	4.957	0.593	0.496
DP105	Transfer of Development Ore from Ore Stockpile to Loader	527220	3480626	1568.34			7.88E-03	1.19E-03	2.93E-04	1.19E-03	2.59	2.04	1.30	0.47	1.16
DP106	Transfer of Development Ore Mined from Loader to Haul Truck	527220	3480626	1568.34			7.88E-03	1.19E-03	2.93E-04	1.19E-03	3.75	2.04	0.89	0.47	0.87
DP107	Transfer from ROM Stockpile to Loader	526856.2	3480646.2	1559.6			2.16E-03	3.27E-04	8.03E-05	3.27E-04	2.59	2.04	1.30	0.47	1.16
DP109	Transfer from Agg Stockpile to Loader	527187	3480489	1619.4			9.02E-03	1.37E-03	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16
DP110	Transfer of Agg Material from Loader to Haul Truck	527187	3480489	1619.4			9.02E-03	1.37E-03	0.00E+00	1.70E-04	3.75	2.04	0.89	0.47	0.87
DP111	Transfer of Shotcrete Aggregate from Stockpile to Loader	527168	3480482	1620.95			6.31E-03	9.56E-04	0.00E+00	1.70E-04	2.59	2.04	1.30	0.47	1.16
DP113	Hardshell NAG Wasterock Storage Drop	527194	3480105	1623.06	1600.2	1600.2	3.53E-02	5.35E-03	4.23E-04	5.35E-03	3.75	3.43	0.70	0.80	1.74
DP114	Ore Stockpile Drop	527220	3480626	1568.34			7.88E-03	1.19E-03	2.93E-04	1.19E-03	3.75	3.43	0.70	0.80	1.74
DP115	ROM Stockpile Drop	526856.2	3480646.2	1559.96			2.16E-03	3.27E-04	8.03E-05	3.27E-04	3.75	3.43	0.70	0.80	1.74
CCBP1_11	Clark CBP Plant	527171.7	3480490.4	1619.37			4.16E-04	4.16E-04	0.00E+00	4.16E-04	-	-	2.40	4.52	2.23
DOZHRS	Dozer on Hardshell Rock Stockpile	526990.0	3480298.5	1623.06	1600.2	1600.2	4.12E-03	3.28E-03	1.11E-04	3.28E-03	-	-	1.75	0.96	0.94
BREAK1	Clark Rock Breaker	526812.60	3480694.90	1554.5			1.21E-04	1.84E-05	1.35E-07	1.78	-	-	1.78	0.43	0.83
PP3	Truck Pneumatic Loadout to Silo 1	527319.5	3480489.70	1606.84		1676.68	2.10E-04	4.37E-05	0.00E+00	4.37E-05	-	-	2.00	1.16	4.98
PP4	Truck Pneumatic Loadout to Silo 2	527320.7	3480485.80	1607.94		1676.74	2.10E-04	4.37E-05	0.00E+00	4.37E-05	-	-	2.00	1.16	4.98



Mine Development  
Mod - Area Road Param

Table A-5. South32 Hermosa Road Area Sources

Index	ID	Description	X	Y	Elevation	PM10 daily	PM2.5 daily	PM2.5 annual	Lead daily	Area	Release height	X length	Y length	Angle	Init. Vert. dim.
						Total Daily PM <sub>10</sub>	Total Daily PM <sub>2.5</sub>	Total Annual PM <sub>2.5</sub>	Total Daily Pb						
						(g/s m <sup>2</sup> )	(g/s m <sup>2</sup> )	(g/s m <sup>2</sup> )	(g/s m <sup>2</sup> )						
	CRAREA1		526380.2	3480832	1538.7	3.69E-06	3.69E-07	2.92E-07	3.50E-10	240	3.13	12	20	1	2.91
	CRAREA2		526376.7	3480866	1524.89	7.97E-06	7.97E-07	5.61E-07	7.57E-10	1065	2.52	15	71	62	2.35
	CRAREA3		526446.8	3480899.4	1521.98	1.17E-05	1.17E-06	8.17E-07	1.11E-09	516	2.52	12	43	83	2.35
	CRAREA4		526493	3480903	1521.1	1.12E-05	1.12E-06	7.81E-07	1.06E-09	540	2.52	12	45	90	2.35
	CRAREA5		526539	3480903	1519.88	1.20E-05	1.20E-06	8.37E-07	1.14E-09	336	2.52	12	28	48.1	2.35
	CRAREA6		526562	3480922	1518.95	8.64E-06	8.64E-07	6.04E-07	8.21E-10	931.2	2.52	16	58.2	14.5	2.35
	CRAREA7		526628.30	3481008.50	1518.46	2.92E-05	2.92E-06	2.09E-06	2.77E-09	398.04	2.27	12.4	32.1	95.9	2.11
	CRAREA8		526671.9	3481003.3	1523.15	4.84E-05	4.84E-06	3.46E-06	4.60E-09	360	2.27	12	30	112	2.11
	CRAREA9		526700.5	3480985.9	1525.15	6.78E-05	6.78E-06	4.85E-06	6.44E-09	600	2.27	8	75	133	2.11
	CRAREA10		526747.8	3480924.2	1529.55	2.55E-05	2.55E-06	1.83E-06	2.43E-09	910	2.27	65	14	59	2.11
	CRAREA11		526786	3480867	1536.77	2.32E-05	2.32E-06	1.66E-06	2.21E-09	750	2.27	50	15	43	2.11
	CRAREA12		526606	3481131.5	1512.96	2.17E-05	2.17E-06	1.58E-06	2.06E-09	1363	2.29	94	14.5	103	2.13
	CRAREA13		526612.3	3481133.9	1512.95	1.94E-05	1.94E-06	1.41E-06	1.85E-09	759.9	2.29	17	44.7	32.1	2.13
	CRAREA14		526840.2	3480842.4	1544.55	2.63E-05	2.63E-06	1.90E-06	2.50E-09	1088	2.27	16	68	122	2.11
	CRAREA15		526911.3	3480690.7	1551.17	3.25E-05	3.25E-06	2.35E-06	3.09E-09	546	2.37	42	13	59.5	2.21
	CRAREA16		526953.3	3480585	1549.74	2.85E-05	2.85E-06	2.06E-06	2.70E-09	624	2.37	16	39	45	2.21
	CRAREA17		527423	3480286	1661.09	3.62E-06	3.62E-07	2.82E-07	3.44E-10	1320	3.10	110	12	90	2.89
	CRAREA18		527418.9	3480170.3	1674.33	3.69E-06	3.69E-07	2.83E-07	3.50E-10	1440	3.08	120	12	90	2.86
	CRAREA19		527420	3480049	1660.24	4.55E-06	4.55E-07	3.49E-07	4.32E-10	700	3.08	70	10	90	2.86
	CRAREA24		526394.8	3480773.8	1529.73	9.43E-06	9.43E-07	6.59E-07	8.95E-10	816.2	2.51	14	58.3	40.5	2.34
	CRAREA25		526279.1	3480771.3	1530.76	1.44E-05	1.44E-06	1.00E-06	1.36E-09	268	2.51	10	26.8	89.4	2.34
	CRAREA26		526192.4	3480836.3	1538.62	8.60E-06	8.60E-07	6.01E-07	8.17E-10	1565.55	2.51	14.7	106.5	124.6	2.34
	CRAREA29		526025.4	3480741.7	1550.06	3.19E-06	3.19E-07	2.61E-07	3.03E-10	629.06	3.08	14.2	44.3	78.9	2.87
	CRAREA33		526636.9	3481173.1	1513.21	2.43E-06	2.43E-07	1.85E-07	2.31E-10	1096.5	2.93	17	64.5	31.9	2.73

ID	Description	X	Y	Elevation	PM10 daily	PM2.5 daily	PM2.5 annual	Lead daily	Area	Release Height	Init. Vert. Dim.
					Emission Rate						
					Total Daily PM <sub>10</sub>	Total Daily PM <sub>2.5</sub>	Total Annual PM <sub>2.5</sub>	Total Daily Pb			
(g/s m <sup>2</sup> )	(g/s m <sup>2</sup> )	(g/s m <sup>2</sup> )	(g/s m <sup>2</sup> )								
CRAREA21		526597.6	3481020.6	1515.96	1.07E-05	1.07E-06	7.50E-07	1.02E-09	562.70	2.52	2.35
CRAREA22		526627.1	3481013.2	1518.58	2.71E-05	2.71E-06	1.95E-06	2.58E-09	610.27	2.29	2.13
CRAREA2Z		527371.7	3479931.9	1670.72	4.64E-06	4.64E-07	3.56E-07	4.40E-10	1144.63	3.08	2.86
CRAREA23		526374.4	3480853.7	1527.19	1.23E-05	1.23E-06	8.61E-07	1.17E-09	468.60	2.51	2.34
CRAREA27		526181.2	3480832.7	1538.35	1.20E-05	1.20E-06	8.42E-07	1.14E-09	798.73	2.51	2.34
CRAREA28		526121.2	3480800.8	1542.08	4.01E-06	4.01E-07	3.27E-07	3.81E-10	834.59	3.08	2.87
CRAREA30		526023.4	3480735.6	1548.96	3.65E-06	3.65E-07	2.98E-07	3.47E-10	1284.04	3.08	2.87
CRAREA31		526008.1	3480625	1553.09	3.40E-06	3.40E-07	2.78E-07	3.23E-10	1968.88	3.08	2.87
CRAREA32		525887.4	3480473.2	1553.94	3.50E-06	3.50E-07	2.85E-07	3.32E-10	765.49	3.08	2.87

Mine Development  
Mod - Vol Road Params

Table A-6. South32 Hermosa Road Volume Sources

Segment Name	INDEX	ID	Description	UTM X Coordinate (m)	UTM Y Coordinate(m)	Elevation (m)	Emission Rate				Road Width (ft)	Road Width (m)	Adjusted Road Width (m)	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)	Area Source (If Applicable)
							Total Daily PM <sub>10</sub> (g/s)	Total Daily PM <sub>2.5</sub> (g/s)	Total Annual PM <sub>2.5</sub> (g/s)	Total Daily Lead (g/s)							
AR	1	TRAR_1	AR	526672.9	3481213.7	1511.02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.93	7.33	2.73	CRAREA33
AR	2	TRAR_2	AR	526665.4	3481199.6	1511.42	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.93	7.33	2.73	CRAREA33
AR	3	TRAR_3	AR	526656.2	3481186.5	1512.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.93	7.33	2.73	CRAREA33
AR	4	TRAR_4	AR	526646.8	3481173.6	1512.84	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.93	7.33	2.73	CRAREA33
RS	5	CRRS_1	RS	526640.6	3481161.6	1513.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA13
RS	6	CRRS_2	RS	526631	3481148.8	1512.96	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA13
RS	7	CRRS_3	RS	526621.4	3481136	1512.82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA13
RS	8	CRRS_4	RS	526611.8	3481123.2	1512.9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA12
RS	9	CRRS_5	RS	526607.9	3481107.7	1513.1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA12
RS	10	CRRS_6	RS	526604	3481092.2	1513.99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA12
RS	11	CRRS_7	RS	526600.2	3481076.6	1514.46	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA12
RS	12	CRRS_8	RS	526596.3	3481061.1	1515.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA12
RS	13	CRRS_9	RS	526595.4	3481045.7	1515.62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA12
RS	14	CRRS_10	RS	526599.9	3481030.3	1515.95	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.29	7.33	2.13	CRAREA22
ST	15	TRST_1	ST	526591.4	3481018.5	1515.58	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA21
ST	16	TRST_2	ST	526589.7	3481002.6	1515.56	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA21
ST	17	TRST_3	ST	526587.4	3480986.8	1516.1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA21
ST	18	TRST_4	ST	526583.9	3480971.2	1516.83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA6
ST	19	TRST_5	ST	526579.8	3480955.7	1517.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA6
ST	20	TRST_6	ST	526575.4	3480940.4	1517.97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA6
ST	21	TRST_7	ST	526568.6	3480925.9	1518.59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA6
ST	22	TRST_8	ST	526559.1	3480913.3	1519.16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA5
ST	23	TRST_9	ST	526547.6	3480902.2	1519.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA5
ST	24	TRST_10	ST	526532.8	3480896.2	1519.9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA4
ST	25	TRST_11	ST	526516.8	3480896.8	1520.27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA4
ST	26	TRST_12	ST	526500.8	3480897.3	1520.6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA4
ST	27	TRST_13	ST	526484.8	3480896.6	1521.22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA3
ST	28	TRST_14	ST	526468.9	3480895.2	1521.66	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA3
ST	29	TRST_15	ST	526453	3480893.7	1522.37	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA3
ST	30	TRST_16	ST	526437.6	3480889.7	1523.19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA2
ST	31	TRST_17	ST	526423.1	3480882.8	1525.89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA2
ST	32	TRST_18	ST	526408.7	3480876	1526.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA2
ST	33	TRST_19	ST	526394.2	3480869.2	1525.99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.52	7.33	2.35	CRAREA2
TU	34	TRTU_1	TU	526387.4	3480860	1527.69	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	35	TRTU_2	TU	526387.3	3480848	1532.8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	36	TRTU_3	TU	526387.2	3480836	1537.8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	37	TRTU_4	TU	526387	3480824	1542.69	4.43E-04	4.43E-05	3.50E-05	4.21E-08	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	38	TRTU_5	TU	526383.2	3480812.7	1546.45	4.43E-04	4.43E-05	3.50E-05	4.21E-08	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	39	TRTU_6	TU	526380.9	3480801.2	1549.4	4.43E-04	4.43E-05	3.50E-05	4.21E-08	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	40	TRTU_7	TU	526381.9	3480789.2	1551.52	4.43E-04	4.43E-05	3.50E-05	4.21E-08	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	41	TRTU_8	TU	526379.5	3480778	1550.99	4.43E-04	4.43E-05	3.50E-05	4.21E-08	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
TU	42	TRTU_9	TU	526373.7	3480767.4	1548.04	4.43E-04	4.43E-05	3.50E-05	4.21E-08	20	6.10	12.10	3.13	5.63	2.91	CRAREA1
SV	43	CRSV1_1	SV	526606.6	3481021.7	1516.44	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA22
SV	44	CRSV1_2	SV	526619.3	3481009	1517.37	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA22
SV	45	CRSV1_3	SV	526635.4	3481002.6	1518.66	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA7
SV	46	CRSV1_4	SV	526653.1	3480999.3	1520.23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA7
SV	47	CRSV1_5	SV	526763.2	3480909.9	1531.4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA10
SV	48	CRSV2_1	SV	526772.2	3480894.3	1533.43	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA10
SV	49	CRSV3_1	SV	526782.6	3480879.9	1535.47	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA10
SV	50	CRSV3_2	SV	526795.9	3480867.7	1537.51	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA11
SV	51	CRSV3_3	SV	526809.2	3480855.6	1539.29	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA11
SV	52	CRSV3_4	SV	526823	3480844.1	1540.79	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27	8.46	2.11	CRAREA11
VD	53	CRVD3_1	VD	526981.9	3480601.5	1552.83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	54	CRVD3_2	VD	526993.6	3480615.2	1554.22	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	55	CRVD3_3	VD	527005.3	3480628.8	1554.72	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	56	CRVD3_4	VD	527017.2	3480642.3	1555.88	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	57	CRVD3_5	VD	527034.4	3480647.5	1560.61	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	58	CRVD3_6	VD	527052	3480647.2	1562.96	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	59	CRVD3_7	VD	527069.7	3480644.1	1563.1	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	60	CRVD3_8	VD	527086.8	3480639.2	1564.98	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	61	CRVD3_9	VD	527102.8	3480631	1567.19	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	62	CRVD3_10	VD	527118.8	3480622.7	1568.95	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VD	63	CRVD3_11	VD	527134.8	3480614.4	1571.09	5.92E-03	5.92E-04	4.28E-04	5.62E-07	40	12.19	18.19	2.37	8.46	2.21	CRAREA16
VW	64	CRVW_1	VW	527147.2	3480608.4	1573.75	7.15E-03	7.15E-04	5.57E-04	6.79E-07	40	12.19	18.19	2.37	8.46	2.20	CRAREA16
VW	65	CRV															

Mine Development  
Mod - Vol Road Parsons

LP	84	TRLP3_10	LP	525816.7	3481672.9	1510.55	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	85	TRLP4_1	LP	525820.3	3481662.2	1511.71	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	86	TRLP4_2	LP	525826.2	3481645.2	1512.35	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	87	TRLP4_3	LP	525832.1	3481628.2	1512.7	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	88	TRLP4_4	LP	525838	3481611.2	1513.09	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	89	TRLP4_5	LP	525843.9	3481594.2	1513.64	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	90	TRLP4_6	LP	525849.8	3481577.2	1514.85	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	91	TRLP4_7	LP	525855.7	3481560.2	1516.59	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	92	TRLP4_8	LP	525861.6	3481543.2	1518.43	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	93	TRLP4_9	LP	525867.5	3481526.2	1519.97	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	94	TRLP4_10	LP	525873.4	3481510.5	1522.14	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	95	TRLP5_1	LP	525879.3	3481503.3	1523.51	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	96	TRLP5_2	LP	525885.2	3481496.1	1525.91	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	97	TRLP5_3	LP	525891.1	3481489.3	1528.23	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	98	TRLP5_4	LP	525897.0	3481482.1	1530.66	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	99	TRLP5_5	LP	525902.9	3481475.2	1533.15	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	100	TRLP5_6	LP	525908.8	3481468.3	1535.66	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	101	TRLP5_7	LP	525914.7	3481461.4	1538.21	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	102	TRLP5_8	LP	525920.6	3481454.5	1540.81	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
LP	103	TRLP5_9	LP	525926.5	3481447.6	1543.45	7.12E-03	7.12E-04	5.50E-04	6.76E-07	40	12.19	18.19	2.16	8.46	2.01
PR	104	TRPR_1	PR	525733.6	3481421.1	1536.96	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	104	TRPR_2	PR	525719.8	3481409.5	1538.32	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	105	TRPR_3	PR	525707.8	3481396.4	1540.23	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	106	TRPR_4	PR	525697.6	3481381.5	1542.27	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	107	TRPR_5	PR	525685.5	3481368.4	1543.91	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	108	TRPR_6	PR	525673.4	3481356.5	1545.18	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	109	TRPR_7	PR	525661.5	3481342.6	1545.95	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	110	TRPR_8	PR	525656.1	3481325.5	1546.26	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	111	TRPR_9	PR	525660.9	3481308.2	1546.44	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	112	TRPR_10	PR	525666.2	3481291	1546.42	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	113	TRPR_11	PR	525673.9	3481274.8	1546.32	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	114	TRPR_12	PR	525681.6	3481258.1	1547.32	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	115	TRPR_13	PR	525689.3	3481242.2	1548.29	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	116	TRPR_14	PR	525697	3481225.9	1549.94	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	117	TRPR_15	PR	525704.7	3481209.7	1553.32	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	118	TRPR_16	PR	525712.4	3481193.4	1558.8	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	119	TRPR_17	PR	525720.1	3481177.1	1571.66	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	120	TRPR_18	PR	525727.8	3481160.8	1574.96	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	121	TRPR_19	PR	525735.5	3481144.6	1578.16	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	122	TRPR_20	PR	525743.1	3481129.9	1579.49	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	123	TRPR_21	PR	525750.6	3481119.2	1580.71	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	124	TRPR_22	PR	525758.1	3481109.3	1583.24	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	125	TRPR_23	PR	525765.6	3481101.3	1583.23	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	126	TRPR_24	PR	525806.8	3481093.3	1582.33	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	127	TRPR_25	PR	525822.9	3481085.3	1582.09	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
PR	128	TRPR_26	PR	525839	3481077.3	1582.31	7.42E-03	7.42E-04	5.73E-04	7.05E-07	40	12.19	18.19	2.16	8.46	2.01
RH	129	TRRH_1	RH	525833.1	3481069.6	1582.65	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	130	TRRH_2	RH	525818.9	3481058.5	1582.59	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	131	TRRH_3	RH	525806	3481046.4	1580.23	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	132	TRRH_4	RH	525798.6	3481030	1577.67	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	133	TRRH_5	RH	525791.2	3481013.6	1578.36	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	134	TRRH_6	RH	525783.8	3480997.2	1579.2	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	135	TRRH_7	RH	525776.4	3480980.8	1584.52	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	136	TRRH_8	RH	525769.1	3480964.3	1589.9	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	137	TRRH_9	RH	525761.7	3480947.9	1592.57	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
RH	138	TRRH_10	RH	525754.3	3480931.5	1594.39	6.03E-03	6.03E-04	4.03E-04	5.73E-07	40	12.19	18.19	2.33	8.46	2.17
FH	139	TRFH_1	FH	525710	3481029.8	1594.53	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
FH	140	TRFH_2	FH	525716.5	3481013	1594.1	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
FH	141	TRFH_3	FH	525722.9	3480996.3	1593.51	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
FH	142	TRFH_4	FH	525729.6	3480979.5	1593	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
FH	143	TRFH_5	FH	525736.1	3480962.7	1592.83	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
FH	144	TRFH_6	FH	525742.6	3480946	1594.22	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
FH	145	TRFH_7	FH	525749.2	3480929.2	1594.35	1.30E-03	1.30E-04	1.06E-04	1.24E-07	40	12.19	18.19	2.43	8.46	2.26
HC	146	TRHC_1	HC	525760.7	3480921.2	1593.19	4.20E-03	4.20E-04	2.17E-04	3.99E-07	40	12.19	18.19	3.12	8.46	2.90
RD	147	TRRD_1	RD	525850.2	3481075.5	1581.8	4.92E-03	4.92E-04	2.64E-04	4.67E-07	40	12.19	18.19	2.10	8.46	1.95
RD	148	TRRD_2	RD	525868.1	3481073.3	1579.3	4.92E-03	4.92E-04	2.64E-04	4.67E-07	40	12.19	18.19	2.10	8.46	1.95
RD	149	TRRD_3	RD	525886	3481071.1	1575.84	4.92E-03	4.92E-04	2.64E-04	4.67E-07	40	12.19	18.19	2.10	8.46	1.95
RD	150	TRRD_4	RD	525902.8	3481076.9	1575.9	4.92E-03	4.92E-04	2.64E-04	4.67E-07	40	12.19	18.19	2.10	8.46	1.95
RD	151	TRRD_5	RD	525919.6	3481083.4	1577.33	4.92E-03	4.92E-04	2.64E-04	4.67E-07	40	12.1				

Mine Development  
Mod - Vol Road Params

DB	175	TRDB_11	DB	526186.9	3481030.4	1561.57	4.67E-03	4.67E-04	2.55E-04	4.43E-07	40	12.19	18.19	2.14	8.46	1.99		
DB	176	TRDB_12	DB	526204.8	3481030.6	1562.22	4.67E-03	4.67E-04	2.55E-04	4.43E-07	40	12.19	18.19	2.14	8.46	1.99		
BQ	177	TRBQ_1	BQ	526218.8	3481023.8	1562.43	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BQ	178	TRBQ_2	BQ	526226.2	3481007.4	1562.45	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BQ	179	TRBQ_3	BQ	526233.5	3480991.4	1561.72	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BQ	180	TRBQ_4	BQ	526240.9	3480974.5	1555.44	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BQ	181	TRBQ_5	BQ	526248.3	3480958.3	1550.18	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BQ	182	TRBQ_6	BQ	526255.7	3480941.7	1546.49	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BQ	183	TRBQ_7	BQ	526263.1	3480925.3	1547.83	7.72E-04	7.72E-05	6.05E-05	7.33E-08	40	12.19	18.19	3.07	8.46	2.86		
BM	184	TRBM_1	BM	526224.4	3481032.2	1562.23	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	185	TRBM_2	BM	526242.3	3481030	1562.06	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	186	TRBM_3	BM	526260.2	3481027.8	1562.1	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	187	TRBM_4	BM	526277	3481032.8	1562.22	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	188	TRBM_5	BM	526293.6	3481039.9	1562.23	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	189	TRBM_6	BM	526310.1	3481046.9	1562.3	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	190	TRBM_7	BM	526326.7	3481054	1562.39	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	191	TRBM_8	BM	526343.2	3481061.1	1562.4	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	192	TRBM_9	BM	526359.7	3481068.2	1562.63	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
BM	193	TRBM_10	BM	526376.3	3481079.3	1562.64	7.97E-03	7.97E-04	4.92E-04	7.57E-07	40	12.19	18.19	3.28	8.46	3.06		
RB	194	TRRB_1	RB	526222.2	3481026	1562.36	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	195	TRRB_2	RB	526235.9	3481014.4	1562.3	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	196	TRRB_3	RB	526249.6	3481002.7	1561.89	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	197	TRRB_4	RB	526263.4	3480991.1	1561.12	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	198	TRRB_5	RB	526277.1	3480979.5	1559.53	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	199	TRRB_6	RB	526293.7	3480972.5	1557.73	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	200	TRRB_7	RB	526310.3	3480965.6	1555.24	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	201	TRRB_8	RB	526328.2	3480965.3	1553.7	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	202	TRRB_9	RB	526346.2	3480965.8	1552.13	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	203	TRRB_10	RB	526364.2	3480966.3	1549.81	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	204	TRRB_11	RB	526382.2	3480966.8	1548.47	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	205	TRRB_12	RB	526400.1	3480967.4	1546.28	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	206	TRRB_13	RB	526418.1	3480967.9	1544.39	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	207	TRRB_14	RB	526436.1	3480968.4	1542.45	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	208	TRRB_15	RB	526454.1	3480968.9	1540.69	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	209	TRRB_16	RB	526472.1	3480969.5	1538.56	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	210	TRRB_17	RB	526488.5	3480976.6	1538.32	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	211	TRRB_18	RB	526503	3480986.3	1538.58	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	212	TRRB_19	RB	526512.3	3481001.7	1536.02	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	213	TRRB_20	RB	526518.8	3481018.2	1532.96	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	214	TRRB_21	RB	526521.7	3481035.9	1532.16	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	215	TRRB_22	RB	526521.8	3481053.9	1530.94	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	216	TRRB_23	RB	526521.9	3481071.9	1530.25	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	217	TRRB_24	RB	526522	3481089.9	1529.65	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	218	TRRB_25	RB	526522.1	3481107.9	1527.46	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	219	TRRB_26	RB	526530.1	3481123.7	1522.39	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	220	TRRB_27	RB	526539.2	3481139.3	1522.16	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	221	TRRB_28	RB	526548.2	3481154.9	1522.61	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	222	TRRB_29	RB	526557.2	3481170.5	1520.82	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	223	TRRB_30	RB	526567.1	3481185	1518.73	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	224	TRRB_31	RB	526583.5	3481192.6	1517	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	225	TRRB_32	RB	526600.5	3481196.8	1515.14	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	226	TRRB_33	RB	526616.8	3481191.4	1513.4	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
RB	227	TRRB_34	RB	526631.1	3481180.4	1512.99	5.81E-03	5.81E-04	4.26E-04	5.52E-07	40	12.19	18.19	2.29	8.46	2.13		
ZY	228	CRZY1_1	ZY	527425	3480164.6	1673.53	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	229	CRZY1_2	ZY	527425	3480152.6	1672.9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	230	CRZY1_3	ZY	527425	3480140.6	1671.66	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	231	CRZY1_4	ZY	527425	3480128.6	1670.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	232	CRZY1_5	ZY	527425	3480116.6	1668.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	233	CRZY1_6	ZY	527425	3480104.6	1666.62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	234	CRZY1_7	ZY	527425	3480092.6	1664.79	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	235	CRZY1_8	ZY	527425	3480080.6	1663.32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	236	CRZY1_9	ZY	527425	3480068.6	1662.54	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	237	CRZY1_10	ZY	527425	3480056.6	1662.04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA18
ZY	238	CRZY1_11	ZY	527425	3480044.6	1661.74	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA19
ZY	239	CRZY1_12	ZY	527425	3480032.6	1661.99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.08	5.63	2.86		CRAREA19
ZY	240	CRZY1_13	ZY	527425	3480020.6	1663	0.00E+00	0.00E+00										

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SV	266	CRSV2_6	SV	526709.8	3480972.2	1524.99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA9
SV	267	CRSV2_7	SV	526717.8	3480964.6	1525.97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA9
SV	268	CRSV2_8	SV	526725.8	3480957.1	1527.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA9
SV	269	CRSV2_9	SV	526733.8	3480949.5	1527.76	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA9
SV	270	CRSV2_10	SV	526741.8	3480942	1528.41	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA9
SV	271	CRSV2_11	SV	526749.4	3480934.1	1529.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA9
SV	272	CRSV2_12	SV	526755	3480926.7	1530.13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	17	5.03	11.03	2.27	5.13	2.11	CRAREA10
BN	273	TRBN_1	BN	526227.8	3481036.4	1562.15	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	274	TRBN_2	BN	526243.3	3481045.5	1562.11	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	275	TRBN_3	BN	526258.9	3481054.6	1562.16	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	276	TRBN_4	BN	526274.4	3481063.6	1562.13	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	277	TRBN_5	BN	526290	3481072.7	1562.09	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	278	TRBN_6	BN	526305.5	3481081.7	1562.2	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	279	TRBN_7	BN	526318	3481094	1562.15	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	280	TRBN_8	BN	526237.8	3481109.1	1562.01	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	281	TRBN_9	BN	526335	3481125.1	1561.61	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	282	TRBN_10	BN	526336.2	3481143.1	1560.67	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	283	TRBN_11	BN	526337.5	3481161	1561.5	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	284	TRBN_12	BN	526338.7	3481179	1562.18	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	285	TRBN_13	BN	526340	3481196.9	1563.82	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	286	TRBN_14	BN	526341.2	3481214.9	1566.53	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	287	TRBN_15	BN	526333.1	3481230.8	1567.9	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	288	TRBN_16	BN	526324.6	3481246.7	1568.43	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	289	TRBN_17	BN	526316	3481262.5	1570.26	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	290	TRBN_18	BN	526307.4	3481278.3	1574.59	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	291	TRBN_19	BN	526298.9	3481294.2	1575.21	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	292	TRBN_20	BN	526290.3	3481310	1575.34	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	293	TRBN_21	BN	526280.8	3481325.2	1575.06	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	294	TRBN_22	BN	526270.1	3481339.7	1574.9	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	295	TRBN_23	BN	526259.4	3481354.1	1574.61	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	296	TRBN_24	BN	526248.7	3481368.6	1574.65	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	297	TRBN_25	BN	526238	3481383.1	1574.88	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	298	TRBN_26	BN	526227.3	3481397.6	1575.23	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	299	TRBN_27	BN	526216.6	3481412.1	1575.39	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	300	TRBN_28	BN	526205.9	3481426.5	1574.69	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	301	TRBN_29	BN	526205.4	3481444.2	1573.79	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	302	TRBN_30	BN	526206	3481462.2	1574.86	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	303	TRBN_31	BN	526209.1	3481478.8	1574.7	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	304	TRBN_32	BN	526223.5	3481489.6	1569.7	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	305	TRBN_33	BN	526238.5	3481494.8	1570.24	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	306	TRBN_34	BN	526254.9	3481487.3	1574.01	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	307	TRBN_35	BN	526271.2	3481479.8	1575.91	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	308	TRBN_36	BN	526287.6	3481472.2	1576.9	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	309	TRBN_37	BN	526303.9	3481464.7	1578.42	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	310	TRBN_38	BN	526320.3	3481457.2	1580.97	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	311	TRBN_39	BN	526336.7	3481449.7	1581.12	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	312	TRBN_40	BN	526353	3481442.2	1578.54	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	313	TRBN_41	BN	526370.5	3481439.8	1577.91	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	314	TRBN_42	BN	526388.5	3481439.8	1578.1	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	315	TRBN_43	BN	526403	3481449.3	1580.29	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	316	TRBN_44	BN	526415.4	3481461.5	1577.84	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	317	TRBN_45	BN	526414.3	3481479.5	1574.77	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	318	TRBN_46	BN	526413.1	3481497.5	1580.56	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	319	TRBN_47	BN	526412	3481515.4	1585.63	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	320	TRBN_48	BN	526410.9	3481533.4	1585.24	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	321	TRBN_49	BN	526409.7	3481551.3	1583.09	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	322	TRBN_50	BN	526408.6	3481569.3	1581.18	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	323	TRBN_51	BN	526407.5	3481587.3	1579.26	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	324	TRBN_52	BN	526409.5	3481605	1575.93	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	325	TRBN_53	BN	526413	3481622.7	1572.53	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	326	TRBN_54	BN	526416.5	3481640.3	1569.69	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	327	TRBN_55	BN	526422.7	3481656.7	1568	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	328	TRBN_56	BN	526434.3	3481670.5	1567.93	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	329	TRBN_57	BN	526445.9	3481684.2	1570.74	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	330	TRBN_58	BN	526457.5	3481698	1572.94	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	331	TRBN_59	BN	526469.1	3481711.8	1576.08	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	
BN	332	TRBN_60	BN	526480.7	3481725.5	1578.76	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72	

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BN	357	TRBN_85	BN	526312.7	3482094.5	1576.99	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	358	TRBN_86	BN	526327.5	3482104.9	1575.61	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	359	TRBN_87	BN	526342.2	3482115.3	1571.51	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	360	TRBN_88	BN	526355.1	3482113.8	1568.44	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	361	TRBN_89	BN	526366	3482099.6	1571.46	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	362	TRBN_90	BN	526377	3482085.3	1576.83	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	363	TRBN_91	BN	526389	3482071	1571.52	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	364	TRBN_92	BN	526398.9	3482056.7	1574.67	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	365	TRBN_93	BN	526409.9	3482042.5	1573.72	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	366	TRBN_94	BN	526420.8	3482028.2	1569.02	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	367	TRBN_95	BN	526431.8	3482013.9	1568.6	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	368	TRBN_96	BN	526442.8	3481999.6	1569.19	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	369	TRBN_97	BN	526453.7	3481985.4	1570.44	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	370	TRBN_98	BN	526464.7	3481971.1	1570.43	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	371	TRBN_99	BN	526475.6	3481956.8	1571.31	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	372	TRBN_100	BN	526486.6	3481942.5	1572.86	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	373	TRBN_101	BN	526497.6	3481928.2	1574.18	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	374	TRBN_102	BN	526508.5	3481914	1576.06	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	375	TRBN_103	BN	526519.5	3481899.7	1576.9	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	376	TRBN_104	BN	526529.6	3481884.9	1577.12	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	377	TRBN_105	BN	526535.9	3481868.1	1577.65	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	378	TRBN_106	BN	526542.2	3481851.2	1577.28	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	379	TRBN_107	BN	526548.5	3481834.3	1577.01	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	380	TRBN_108	BN	526554.8	3481817.5	1579.06	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	381	TRBN_109	BN	526561.1	3481800.6	1580.56	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	382	TRBN_110	BN	526569.6	3481785.3	1581.5	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	383	TRBN_111	BN	526583.5	3481773.9	1581.19	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	384	TRBN_112	BN	526597.4	3481762.4	1579.44	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	385	TRBN_113	BN	526613.3	3481757.5	1576.74	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	386	TRBN_114	BN	526631.2	3481759.1	1573.07	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	387	TRBN_115	BN	526648.8	3481762.2	1569.79	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	388	TRBN_116	BN	526666.1	3481767.1	1566.36	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	389	TRBN_117	BN	526683.5	3481772.1	1564.42	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	390	TRBN_118	BN	526700.8	3481777	1564.43	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	391	TRBN_119	BN	526718.1	3481782	1566.39	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	392	TRBN_120	BN	526735.4	3481786.9	1568.47	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	393	TRBN_121	BN	526752.7	3481791.9	1570.17	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	394	TRBN_122	BN	526765.5	3481803	1570.72	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	395	TRBN_123	BN	526775.5	3481818	1568.7	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	396	TRBN_124	BN	526785.5	3481833	1564.81	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	397	TRBN_125	BN	526787.1	3481850.7	1558.86	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	398	TRBN_126	BN	526788	3481868.7	1552.2	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	399	TRBN_127	BN	526788.9	3481886.6	1544.75	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	400	TRBN_128	BN	526789.2	3481904.5	1535.57	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	401	TRBN_129	BN	526792.7	3481921.3	1526.57	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	402	TRBN_130	BN	526776.1	3481938.1	1524.04	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	403	TRBN_131	BN	526769.6	3481954.8	1529.66	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	404	TRBN_132	BN	526763	3481971.6	1530.27	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	405	TRBN_133	BN	526748.2	3481981.6	1528.26	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	406	TRBN_134	BN	526733	3481991.2	1525.38	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	407	TRBN_135	BN	526717.8	3482000.9	1523.6	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	408	TRBN_136	BN	526702.7	3482010.5	1521.32	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	409	TRBN_137	BN	526687.5	3482020.2	1516.74	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	410	TRBN_138	BN	526672.3	3482029.8	1517.38	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	411	TRBN_139	BN	526657.1	3482039.5	1520.6	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	412	TRBN_140	BN	526641.9	3482049.1	1526.11	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	413	TRBN_141	BN	526630	3482062.3	1530.79	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	414	TRBN_142	BN	526619.2	3482076.7	1534.12	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	415	TRBN_143	BN	526608.4	3482091.1	1537.44	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	416	TRBN_144	BN	526597.6	3482105.5	1540.19	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	417	TRBN_145	BN	526586.8	3482120	1543.98	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	418	TRBN_146	BN	526583.8	3482136.4	1543.85	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	419	TRBN_147	BN	526586.2	3482154.2	1540.49	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	420	TRBN_148	BN	526588.6	3482172.1	1539.69	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
BN	421	TRBN_149	BN	526590.9	3482189.9	1536.14	1.07E-02	1.07E-03	6.70E-04	1.02E-06	40	12.19	18.19	2.92	8.46	2.72
LC	422	TRLC_1	LC	525607.9	3482112.8	1493.18	7.58E-04	7.58E-05	6.15E-05	7.20E-08	40	12.19	18.19	3.10	8.46	2.88
LC	423	TRLC_2	LC	525615.8	3482096.4	1492.97	7.58E-04	7.58E-05	6.15E-05	7.20E-08	40	12.19	18.19	3.10	8.46	2.88
LC	424	TRLC_3	LC	525623.6	3482080	1492.82	7.58E-04	7.58E-05	6.15E-05	7.20E-08	40	12.19	18.19	3.10	8.46	2.88
LC	425	TRLC_4	LC	525631.5	348206											

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LA	448	TRLA_7	LA	525812.6	3481917.3	1504.89	8.33E-04	8.33E-05	6.48E-05	7.91E-08	40	12.19	18.19	3.13	8.46	2.91
LA	449	TRLA_8	LA	525807.5	3481934.1	1509.07	8.33E-04	8.33E-05	6.48E-05	7.91E-08	40	12.19	18.19	3.13	8.46	2.91
LA	450	TRLA_9	LA	525798.5	3481949.9	1515.28	8.33E-04	8.33E-05	6.48E-05	7.91E-08	40	12.19	18.19	3.13	8.46	2.91
LA	451	TRLA_10	LA	525789.5	3481965.8	1517.71	8.33E-04	8.33E-05	6.48E-05	7.91E-08	40	12.19	18.19	3.13	8.46	2.91
HI	452	TRHI_1	HI	525743.4	3480918.6	1594.94	5.00E-03	5.00E-04	3.02E-04	4.74E-07	40	12.19	18.19	2.13	8.46	1.98
HI	453	TRHI_2	HI	525728.6	3480908	1597.57	5.00E-03	5.00E-04	3.02E-04	4.74E-07	40	12.19	18.19	2.13	8.46	1.98
HI	454	TRHI_3	HI	525713.8	3480897.4	1599.59	5.00E-03	5.00E-04	3.02E-04	4.74E-07	40	12.19	18.19	2.13	8.46	1.98
HI	455	TRHI_4	HI	525699	3480886.9	1600.19	5.00E-03	5.00E-04	3.02E-04	4.74E-07	40	12.19	18.19	2.13	8.46	1.98
HI	456	TRHI_5	HI	525684.2	3480876.3	1606.61	5.00E-03	5.00E-04	3.02E-04	4.74E-07	40	12.19	18.19	2.13	8.46	1.98
HI	457	TRHI_6	HI	525669.4	3480865.7	1610.1	5.00E-03	5.00E-04	3.02E-04	4.74E-07	40	12.19	18.19	2.13	8.46	1.98
JI	458	TRJI_1	JI	525649.3	3480863.1	1604.38	2.17E-03	2.17E-04	7.29E-05	2.06E-07	40	12.19	18.19	3.15	8.46	2.93
JI	459	TRJI_2	JI	525639.3	3480878.3	1592.35	2.17E-03	2.17E-04	7.29E-05	2.06E-07	40	12.19	18.19	3.15	8.46	2.93
JI	460	TRJI_3	JI	525629.4	3480893.5	1587.76	2.17E-03	2.17E-04	7.29E-05	2.06E-07	40	12.19	18.19	3.15	8.46	2.93
JI	461	TRJI_4	JI	525619.4	3480908.8	1584.88	2.17E-03	2.17E-04	7.29E-05	2.06E-07	40	12.19	18.19	3.15	8.46	2.93
IK	462	TRIK_1	IK	525648.2	3480855.9	1608.13	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	463	TRIK_2	IK	525630	3480855.5	1599.09	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	464	TRIK_3	IK	525614	3480846.9	1600.08	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	465	TRIK_4	IK	525598.1	3480838.2	1603.9	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	466	TRIK_5	IK	525587	3480823.8	1607.28	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	467	TRIK_6	IK	525576.1	3480809.2	1607.25	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	468	TRIK_7	IK	525565.1	3480794.7	1607.97	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	469	TRIK_8	IK	525554.2	3480780.2	1607.64	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	470	TRIK_9	IK	525550.8	3480764.2	1604.83	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	471	TRIK_10	IK	525555.9	3480746.8	1604.23	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	472	TRIK_11	IK	525569.4	3480735.4	1603.53	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	473	TRIK_12	IK	525584.4	3480725	1603.59	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	474	TRIK_13	IK	525599.3	3480714.7	1603.28	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	475	TRIK_14	IK	525615	3480706.3	1601.53	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	476	TRIK_15	IK	525633	3480703.8	1600.41	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	477	TRIK_16	IK	525651.1	3480701.3	1602.65	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	478	TRIK_17	IK	525669.1	3480698.8	1602.85	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	479	TRIK_18	IK	525687.1	3480696.3	1603.16	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IK	480	TRIK_19	IK	525705.1	3480693.7	1601.87	3.12E-03	3.12E-04	2.57E-04	2.96E-07	40	12.19	18.19	2.11	8.46	1.96
IL	481	TRIL_1	IL	525669.2	3480858	1610.82	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	482	TRIL_2	IL	525687.2	3480860.9	1609.74	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	483	TRIL_3	IL	525705.1	3480863.7	1603.06	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	484	TRIL_4	IL	525714	3480876.4	1601.52	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	485	TRIL_5	IL	525729.9	3480867.5	1601.64	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	486	TRIL_6	IL	525745.8	3480858.6	1600.77	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	487	TRIL_7	IL	525761.7	3480849.7	1599.8	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	488	TRIL_8	IL	525777.5	3480840.9	1600.86	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	489	TRIL_9	IL	525790.1	3480830.9	1603.66	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	490	TRIL_10	IL	525782.4	3480814.5	1605.93	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	491	TRIL_11	IL	525774.7	3480798	1607.82	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	492	TRIL_12	IL	525785.2	3480786.7	1607.71	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
IL	493	TRIL_13	IL	525800.5	3480776.8	1610.4	8.89E-04	8.89E-05	7.08E-05	8.44E-08	40	12.19	18.19	2.95	8.46	2.74
MT	494	TRMT_1	MT	526387	3481084.1	1560.71	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	495	TRMT_2	MT	526393.6	3481101	1554.69	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	496	TRMT_3	MT	526400.1	3481118	1550.63	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	497	TRMT_4	MT	526406.7	3481135	1546.36	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	498	TRMT_5	MT	526413.3	3481151.9	1546.32	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	499	TRMT_6	MT	526419.9	3481168.9	1548.73	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	500	TRMT_7	MT	526426.5	3481185.8	1553.4	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
MT	501	TRMT_8	MT	526433	3481202.8	1557.69	8.31E-04	8.31E-05	6.57E-05	7.89E-08	40	12.19	18.19	3.10	8.46	2.89
BP	502	TRBP_1	BP	526213	3481018.5	1562.57	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	503	TRBP_2	BP	526204	3481003.9	1562.81	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	504	TRBP_3	BP	526207.5	3480996.9	1562.38	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	505	TRBP_4	BP	526209.8	3480989.7	1561.38	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	506	TRBP_5	BP	526208.9	3480951.6	1559.58	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	507	TRBP_6	BP	526208	3480933.4	1558.11	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	508	TRBP_7	BP	526207	3480915.3	1556.56	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	509	TRBP_8	BP	526200.7	3480898.2	1554.9	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	510	TRBP_9	BP	526189.4	3480884.3	1553.15	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	511	TRBP_10	BP	526174.2	3480876.5	1552.15	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	512	TRBP_11	BP	526156.1	3480875	1551.23	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	513	TRBP_12	BP	526138.4	3480871.7	1549.76	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	514	TRBP_13	BP	526123.1	3480862.8	1546.36	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	515	TRBP_14	BP	526115.1	3480847.4	1543.85	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51	8.46	2.34
BP	516	TRBP_15	BP	526117	3480829.3	1542.96	2.32E-03	2.32E-04	1.62E-04	2.20E-07	40	12.19	18.19	2.51		

Mine Development  
Mod - Vol Road Params

VX	539	CRVX_13	VX	527075.3	3480448.1	1577.66	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	540	CRVX_14	VX	527081.5	3480431	1578.53	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	541	CRVX_15	VX	527088.6	3480414.3	1581.05	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	542	CRVX_16	VX	527096.4	3480397.9	1583.95	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	543	CRVX_17	VX	527106.9	3480383.1	1587.86	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	544	CRVX_18	VX	527117.8	3480368.5	1591.36	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	545	CRVX_19	VX	527129.7	3480354.7	1596.73	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	546	CRVX_20	VX	527141.5	3480340.9	1602.22	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	547	CRVX_21	VX	527153.5	3480327.2	1604.25	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	548	CRVX_22	VX	527166.1	3480314.1	1603.43	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	549	CRVX_23	VX	527178.7	3480301	1602.54	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	550	CRVX_24	VX	527191.4	3480288	1602.14	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	551	CRVX_25	VX	527204	3480274.9	1601.99	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	552	CRVX_26	VX	527216.7	3480261.8	1604.14	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	553	CRVX_27	VX	527229.3	3480248.7	1610.85	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	554	CRVX_28	VX	527231	3480232	1611.73	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	555	CRVX_29	VX	527228.6	3480214	1609.9	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	556	CRVX_30	VX	527226.3	3480195.9	1605.36	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	557	CRVX_31	VX	527224	3480179.9	1599.88	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	558	CRVX_32	VX	527221.6	3480159.9	1593.59	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	559	CRVX_33	VX	527219.3	3480141.8	1588.46	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	560	CRVX_34	VX	527216.9	3480123.8	1590.74	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
VX	561	CRVX_35	VX	527214.6	3480105.7	1594.31	1.36E-03	1.36E-04	6.54E-05	1.29E-07	40	12.19	18.19	3.14	8.46	2.92
YA	562	CRYA_1	YA	527335.1	3480572.9	1588.85	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	563	CRYA_2	YA	527334.3	3480591	1592.44	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	564	CRYA_3	YA	527332.6	3480609.1	1597.14	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	565	CRYA_4	YA	527328.9	3480626.4	1601.14	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	566	CRYA_5	YA	527317.1	3480640.2	1601.19	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	567	CRYA_6	YA	527301.2	3480648.5	1598.78	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	568	CRYA_7	YA	527284.1	3480654.3	1594.96	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	569	CRYA_8	YA	527266.1	3480657.2	1589.52	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	570	CRYA_9	YA	527248.1	3480652.2	1583.96	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	571	CRYA_10	YA	527230.8	3480663.7	1583.12	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
YA	572	CRYA_11	YA	527214.7	3480672.3	1580.5	7.37E-04	7.37E-05	6.11E-05	7.00E-08	40	12.19	18.19	#N/A	8.46	#N/A
WX	573	CRWX_1	WX	527254	3480558.1	1584.96	1.33E-03	1.33E-04	9.98E-05	1.26E-07	20	6.10	12.10	3.04	5.63	2.83
WX	574	CRWX_2	WX	527258.9	3480547.1	1586.91	1.33E-03	1.33E-04	9.98E-05	1.26E-07	20	6.10	12.10	3.04	5.63	2.83
WX	575	CRWX_3	WX	527265.4	3480537	1588.25	1.33E-03	1.33E-04	9.98E-05	1.26E-07	20	6.10	12.10	3.04	5.63	2.83
WX	576	CRWX_4	WX	527276.1	3480531.4	1589.08	1.33E-03	1.33E-04	9.98E-05	1.26E-07	20	6.10	12.10	3.04	5.63	2.83
WX	577	CRWX_5	WX	527287.2	3480527	1591.22	1.33E-03	1.33E-04	9.98E-05	1.26E-07	20	6.10	12.10	3.04	5.63	2.83
WX	578	CRWX_6	WX	527299.1	3480524.5	1594.28	1.33E-03	1.33E-04	9.98E-05	1.26E-07	20	6.10	12.10	3.04	5.63	2.83
XB	579	CRXB_1	XB	527305.5	3480513.2	1598.7	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	580	CRXB_2	XB	527305.5	3480501.1	1601.29	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	581	CRXB_3	XB	527303.7	3480489.5	1602.64	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	582	CRXB_4	XB	527293.6	3480484.5	1600.29	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	583	CRXB_5	XB	527281.9	3480481.6	1602.14	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	584	CRXB_6	XB	527273.3	3480492.2	1601.42	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	585	CRXB_7	XB	527264.8	3480500.7	1600.44	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	586	CRXB_8	XB	527256.2	3480509.3	1599.77	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	587	CRXB_9	XB	527247.1	3480517.2	1599.36	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	588	CRXB_10	XB	527237.2	3480524	1599.95	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	589	CRXB_11	XB	527227	3480530.5	1600.69	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	590	CRXB_12	XB	527215	3480531.6	1603.61	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	591	CRXB_13	XB	527202.9	3480532.6	1604.37	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	592	CRXB_14	XB	527191.2	3480535.3	1603.64	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	593	CRXB_15	XB	527179.4	3480538.3	1603.29	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	594	CRXB_16	XB	527167.7	3480541.2	1603.22	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	595	CRXB_17	XB	527156	3480544.2	1602.26	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	596	CRXB_18	XB	527144.2	3480547.2	1601.36	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	597	CRXB_19	XB	527132.5	3480550.1	1600.77	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	598	CRXB_20	XB	527120.8	3480553.1	1600.14	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	599	CRXB_21	XB	527108.7	3480553.4	1600.23	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	600	CRXB_22	XB	527102.1	3480547.2	1601.36	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	601	CRXB_23	XB	527105.1	3480537.3	1603.21	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	602	CRXB_24	XB	527115.1	3480530.4	1605.59	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	603	CRXB_25	XB	527126.3	3480526.1	1607.4	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	604	CRXB_26	XB	527137.7	3480522	1609.15	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	605	CRXB_27	XB	527149.4	3480519	1609.92	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	606	CRXB_28	XB	527161.3	3480517	1610.25	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78
XB	607	CRXB_29	XB	527173.2	3480514.9	1610.77	6.33E-04	6.33E-05	4.58E-05	6.02E-08	20	6.10	12.10	2.99	5.63	2.78



Mine Development  
Mod - Vol Road Params

BZ	630	CRBZ_7	BZ	527285	3480422.3	1629.25	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	631	CRBZ_8	BZ	527296.1	3480417.5	1631.03	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	632	CRBZ_9	BZ	527307.2	3480412.7	1632.33	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	633	CRBZ_10	BZ	527318.3	3480407.9	1633.77	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	634	CRBZ_11	BZ	527329.4	3480403.1	1634.32	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	635	CRBZ_12	BZ	527340.5	3480398.3	1635.03	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	636	CRBZ_13	BZ	527351.6	3480393.5	1635.29	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	637	CRBZ_14	BZ	527362.8	3480388.8	1635.53	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	638	CRBZ_15	BZ	527373.9	3480384	1636.6	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	639	CRBZ_16	BZ	527385	3480379.2	1638.9	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	640	CRBZ_17	BZ	527395.3	3480373.5	1641.35	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	641	CRBZ_18	BZ	527400.7	3480363.4	1642.94	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	642	CRBZ_19	BZ	527392.2	3480354.9	1644.85	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	643	CRBZ_20	BZ	527381.2	3480351.7	1646.52	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	644	CRBZ_21	BZ	527369.1	3480351	1647.9	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	645	CRBZ_22	BZ	527357.1	3480350.3	1649.83	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	646	CRBZ_23	BZ	527347	3480345.5	1653.02	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	647	CRBZ_24	BZ	527344.2	3480335.1	1656.11	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	648	CRBZ_25	BZ	527350.8	3480326.5	1658.04	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	649	CRBZ_26	BZ	527362	3480321.9	1658.16	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	650	CRBZ_27	BZ	527373.5	3480318.4	1657.99	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	651	CRBZ_28	BZ	527385.4	3480316.8	1657.06	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	652	CRBZ_29	BZ	527397.4	3480315.2	1656.13	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	653	CRBZ_30	BZ	527408.5	3480311.5	1656.14	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	654	CRBZ_31	BZ	527417.6	3480303.6	1657.51	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	655	CRBZ_32	BZ	527424.3	3480294	1659.22	5.31E-04	5.31E-05	4.13E-05	5.04E-08	20	6.10	12.10	3.10	5.63	2.89	
BZ	656	CRBZ_33	BZ	527427.5	3480282.4	1661.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	657	CRBZ_34	BZ	527427.4	3480270.3	1663.36	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	658	CRBZ_35	BZ	527427.3	3480258.2	1665.36	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	659	CRBZ_36	BZ	527427.2	3480246.1	1667.27	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	660	CRBZ_37	BZ	527427.1	3480234	1669.17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	661	CRBZ_38	BZ	527427	3480221.9	1670.62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	662	CRBZ_39	BZ	527427	3480209.8	1671.78	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	663	CRBZ_40	BZ	527426.9	3480197.7	1672.72	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
BZ	664	CRBZ_41	BZ	527426.8	3480185.6	1673.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	3.10	5.63	2.89	CRAREA17
ZA	665	CRZA_1	ZA	527419.8	3480177.2	1674.31	6.55E-04	6.55E-05	5.17E-05	6.22E-08	20	6.10	12.10	3.13	5.63	2.91	
ZA	666	CRZA_2	ZA	527407.7	3480177.2	1675.46	6.55E-04	6.55E-05	5.17E-05	6.22E-08	20	6.10	12.10	3.13	5.63	2.91	
VC	667	CRVC_1	VC	526826.1	3480827.6	1542.04	8.09E-04	8.09E-05	5.89E-05	7.68E-08	40	12.19	18.19	3.15	8.46	2.93	
TV	668	TRTV_1	TV	526374.8	3480832.1	1536.54	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	669	TRTV_2	TV	526366.9	3480815.7	1539.59	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	670	TRTV_3	TV	526359.1	3480799.3	1540.93	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	671	TRTV_4	TV	526351.7	3480782.6	1539.45	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	672	TRTV_5	TV	526343	3480766.9	1532.47	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	673	TRTV_6	TV	526331.8	3480752.5	1530.29	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	674	TRTV_7	TV	526320.6	3480738.2	1533.21	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	675	TRTV_8	TV	526309.4	3480723.8	1541.83	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	676	TRTV_9	TV	526293.3	3480721.3	1548.89	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	677	TRTV_10	TV	526275.3	3480723.5	1547	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	678	TRTV_11	TV	526257.4	3480726.6	1550.75	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	679	TRTV_12	TV	526239.6	3480730.5	1554.16	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	680	TRTV_13	TV	526221.4	3480731.8	1557.84	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	681	TRTV_14	TV	526206.9	3480724	1564.46	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	682	TRTV_15	TV	526202.1	3480706.4	1567.08	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	683	TRTV_16	TV	526200.2	3480688.6	1570.13	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	684	TRTV_17	TV	526213.4	3480679.4	1574.88	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	685	TRTV_18	TV	526227.8	3480666.9	1578.9	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	686	TRTV_19	TV	526240.8	3480655.1	1581.77	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	687	TRTV_20	TV	526253.7	3480643.4	1584.03	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	688	TRTV_21	TV	526262.8	3480628.6	1588.69	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	689	TRTV_22	TV	526265.9	3480610.6	1594.1	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	690	TRTV_23	TV	526266.8	3480592.5	1598.76	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	691	TRTV_24	TV	526267.3	3480574.3	1602.51	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
TV	692	TRTV_25	TV	526260.5	3480557.8	1602.12	8.50E-04	8.50E-05	6.93E-05	8.07E-08	40	12.19	18.19	3.08	8.46	2.87	
VA	693	CRVA_1	VA	526845.8	3480673.9	1553.4	8.71E-04	8.71E-05	7.23E-05	8.27E-08	40	12.19	18.19	3.11	8.46	2.89	
VA	694	CRVA_2	VA	526845.8	3480655.7	1555.59	8.71E-04	8.71E-05	7.23E-05	8.27E-08	40	12.19	18.19	3.11	8.46	2.89	
VA	695	CRVA_3	VA	526842.4	3480638.2	1559.23	8.71E-04	8.71E-05	7.23E-05	8.27E-08	40	12.19	18.19	3.11	8.46	2.89	
VB	696	CRVB_1	VB	526841.6	3480831.7	1542.25	0.00E+00	0.00E+00	0.00E+00	0.00E+00	40	12.19	18.19	2.27			

Mine Development  
Mod - Vol Road Parsons

VD	721	CRVD2_9	VD	526960.7	3480585.3	1549.06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	2.37	5.63	2.21	CRAREA16
VD	722	CRVD2_10	VD	526971.5	3480588.9	1550.45	0.00E+00	0.00E+00	0.00E+00	0.00E+00	20	6.10	12.10	2.37	5.63	2.21	CRAREA16
ZY	723	CRZY2_1	ZY	527400.5	3479925.7	1672.39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	724	CRZY2_2	ZY	527408.2	3479919.9	1672.43	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	725	CRZY2_3	ZY	527416	3479914.2	1672.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	726	CRZY2_4	ZY	527424.3	3479908.6	1672.09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	727	CRZY2_5	ZY	527433.9	3479903.9	1672	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	728	CRZY2_6	ZY	527442	3479914.1	1671.93	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	729	CRZY2_7	ZY	527450.3	3479918.6	1671.75	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
ZY	730	CRZY2_8	ZY	527459.9	3479919.5	1671.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	12	3.66	9.66	3.08	4.49	2.86	CRAREAZY
TP	731	TRTP_1	TP	526374.8	3480845.3	1530.49	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA23
TP	732	TRTP_2	TP	526364.7	3480833.2	1530.52	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA23
TP	733	TRTP_3	TP	526354.6	3480821.1	1530.44	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA23
TP	734	TRTP_4	TP	526344.4	3480809.1	1530.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA24
TP	735	TRTP_5	TP	526334.3	3480797	1529.99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA24
TP	736	TRTP_6	TP	526324.2	3480785	1528.67	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA24
TP	737	TRTP_7	TP	526314.1	3480772.9	1529.41	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA24
TP	738	TRTP_8	TP	526303.3	3480766.2	1530.18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA25
TP	739	TRTP_9	TP	526294.6	3480766.2	1530.61	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA25
TP	740	TRTP_10	TP	526271.2	3480774.1	1531.05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	741	TRTP_11	TP	526258.1	3480782.8	1531.82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	742	TRTP_12	TP	526245.3	3480792.1	1532.43	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	743	TRTP_13	TP	526232.5	3480801.3	1532.89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	744	TRTP_14	TP	526219.8	3480810.5	1533.53	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	745	TRTP_15	TP	526207	3480819.7	1534.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	746	TRTP_16	TP	526192.5	3480825.4	1535.53	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA26
TP	747	TRTP_17	TP	526177	3480823.9	1536.33	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA27
TP	748	TRTP_18	TP	526162.5	3480818.5	1537.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA27
TP	749	TRTP_19	TP	526149.2	3480810.1	1537.66	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA27
TP	750	TRTP_20	TP	526134.4	3480807.3	1540.11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA27
TP	751	TRTP_21	TP	526119.2	3480819.6	1542.51	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	2.51	7.33	2.34	CRAREA27
DP	752	TRDP_1	DP	526117.1	3480795.9	1542.93	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA28
DP	753	TRDP_2	DP	526113.9	3480781.6	1541.79	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA28
DP	754	TRDP_3	DP	526102.5	3480770.9	1542.68	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA28
DP	755	TRDP_4	DP	526090.2	3480761	1543.95	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA28
DP	756	TRDP_5	DP	526077.9	3480751.1	1546.32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA28
DP	757	TRDP_6	DP	526064.5	3480743.4	1549.84	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA29
DP	758	TRDP_7	DP	526049.3	3480739.2	1549.07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA29
DP	759	TRDP_8	DP	526033.9	3480735.9	1547.76	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA29
DP	760	TRDP_9	DP	526021.2	3480727.4	1547.87	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	761	TRDP_10	DP	526014.8	3480713.5	1548.3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	762	TRDP_11	DP	526012.2	3480698	1548.74	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	763	TRDP_12	DP	526011.3	3480682.3	1548.8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	764	TRDP_13	DP	526011	3480665.6	1548.93	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	765	TRDP_14	DP	526010.8	3480650.8	1549.93	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	766	TRDP_15	DP	526010.5	3480635.1	1551.02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA30
DP	767	TRDP_16	DP	526014	3480619.7	1551.51	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	768	TRDP_17	DP	526018.2	3480606.4	1551.34	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	769	TRDP_18	DP	526017.4	3480588.8	1550.3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	770	TRDP_19	DP	526010.9	3480574.6	1549.68	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	771	TRDP_20	DP	526000.3	3480563	1551.23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	772	TRDP_21	DP	525989.6	3480551.3	1552.73	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	773	TRDP_22	DP	525979	3480539.7	1553.32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	774	TRDP_23	DP	525968.4	3480528.1	1554.67	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	775	TRDP_24	DP	525957.7	3480516.5	1554.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	776	TRDP_25	DP	525947.1	3480504.8	1554.08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA31
DP	777	TRDP_26	DP	525939.7	3480491.3	1557.13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA32
DP	778	TRDP_27	DP	525925.4	3480484.8	1556	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA32
DP	779	TRDP_28	DP	525911.1	3480478.2	1555.31	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA32
DP	780	TRDP_29	DP	525896.7	3480471.7	1554.28	0.00E+00	0.00E+00	0.00E+00	0.00E+00	32	9.75	15.75	3.08	7.33	2.87	CRAREA32
OP	781	TROP_1	OP	525737.6	3481435.4	1535.95	5.83E-04	5.83E-05	4.35E-05	5.54E-08	20	6.10	12.10	3.10	5.63	2.89	
OP	782	TROP_2	OP	525733.3	3481446.7	1535.15	5.83E-04	5.83E-05	4.35E-05	5.54E-08	20	6.10	12.10	3.10	5.63	2.89	
OP	783	TROP_3	OP	525728.9	3481458	1536.32	5.83E-04	5.83E-05	4.35E-05	5.54E-08	20	6.10	12.10	3.10	5.63	2.89	
OP	784	TROP_4	OP	525724.6	3481469.3	1536.83	5.83E-04	5.83E-05	4.35E-05	5.54E-08	20	6.10	12.10	3.10	5.63	2.89	
OP	785	TROP_5	OP	525720.2	3481480.6	1537.15	5.83E-04	5.83E-05	4.35E-05	5.54E-08	20	6.10	12.10	3.10	5.63	2.89	
OP	786	TROP_6	OP	525715.9	3481491.9	1537.27	5.83E-04	5.83E-05	4.35E-05	5.54E-08	20						

## **APPENDIX B. PARTICLE SIZE DISTRIBUTION**

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**Mine Development  
Particle Size Distribution**

**Mine Development  
Particle Size Distribution**

**Table B-1a. South32 Hermosa Particle Sizes**

Particle Size (µm)		Mean Particle Diameter (µm)
Lower	Upper	
0	3.5	2.20
3.5	5	4.29
5	7	6.06
7	8.5	7.77
8.5	10	9.27

Taken From Rosemont Copper Project, AERMOD Modeling Analysis. Appendix A. December 2017

**Table B-1b. South32 Hermosa Densities**

Density of Ore Rock (t/m <sup>3</sup> )		Density of Tailings (g/cm <sup>3</sup> )	
(t/m <sup>3</sup> )	(g/cm <sup>3</sup> )	(t/m <sup>3</sup> )	(g/cm <sup>3</sup> )
3.01	3.01	2.82	2.82

Note: Particle Density based on PFD received from South32 on 5/22/2022

**Table B-1c. South32 Taylor Drilling Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	6.57E-03	<2.5	2.20	0.4732141	1.00	1
10	6.57E-03	10-2.5	9.27	-2.41E-04	0.00	N/A
30	1.39E-02	30-10	--	5.27E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
1.33E-05	-1.67E-04	6.91E-03

lb/hr	Mean Particle Size	% of Emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.01	2.20	48%	102%	102%
0.01	4.29	46%	99%	-3%
0.01	6.06	46%	98%	-1%
0.01	7.77	46%	99%	0%
0.01	9.27	47%	100%	1%

**Table B-1d. South32 Taylor Blasting Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	2.96E-01	<2.5	2.20	1.98E-01	0.38	1
10	7.77E-01	10-2.5	9.27	0.3217858	0.62	N/A
30	1.49E+00	30-10	--	4.80E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-1.03E-03	7.70E-02	1.10E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.27	2.20	18%	37%	37%
0.42	4.29	28%	57%	20%
0.54	6.06	36%	73%	16%
0.65	7.77	43%	88%	15%
0.74	9.27	49%	100%	12%

**Table B-1e. South32 Taylor Underground Crushing Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	1.27E-01	<2.5	2.20	5.51E-01	1.22	1
10	1.04E-01	10-2.5	9.27	-1.01E-01	N/A	N/A
30	2.32E-01	30-10	--	5.50E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
3.44E-04	-7.41E-03	1.44E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.13	2.20	56%	123%	123%
0.12	4.29	51%	113%	-10%
0.11	6.06	48%	107%	-6%
0.11	7.77	46%	102%	-4%
0.10	9.27	45%	100%	-2%

**Table B-1f. South32 Taylor Underground Drop Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	2.53E-04	<2.5	2.20	0.4732141	1.00050978	1
10	2.53E-04	10-2.5	9.27	-2.41E-04	-0.0005098	N/A
30	5.35E-04	30-10	--	5.27E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
5.13E-07	-6.43E-06	2.66E-04

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.0003	2.20	48%	102%	102%
0.0002	4.29	46%	99%	-3%
0.0002	6.06	46%	98%	-1%
0.0002	7.77	46%	99%	0%
0.0003	9.27	47%	100%	1%

\* The particle size multiplier for all Taylor underground drop points is the same, therefore one emission source is used in the table above as a representative sample.

**Mine Development  
Particle Size Distribution**

**Table B-1g. South32 Taylor Underground Unpaved Roads Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	5.47E-01	<2.5	2.20	2.58E-02	0.1	1
10	5.47E+00	10-2.5	9.27	2.32E-01	0.9	N/A
30	2.12E+01	30-10	--	7.42E-01	N/A	N/A

\* The particle size multiplier for all Taylor underground roads is the same, therefore one emission source is used in the table above as a representative sample.

Linear Regression (2nd degree)		
a	b	y
4.73E-03	5.97E-01	-9.75E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.36	2.20	2%	7%	7%
1.67	4.29	8%	34%	26%
2.81	6.06	13%	57%	23%
3.95	7.77	19%	80%	23%
4.96	9.27	23%	100%	20%

**Table B-1h. South32 Taylor Underground Emissions - ALL**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	9.77E-01	<2.5	2.20	4.26E-02	0.15377427	1
10	6.35E+00	10-2.5	9.27	2.35E-01	0.84622573	N/A
30	2.29E+01	30-10	--	7.23E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
4.07E-03	6.66E-01	-7.14E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.7749	2.20	3%	13%	13%
2.2215	4.29	10%	38%	25%
3.4690	6.06	15%	60%	21%
4.7108	7.77	21%	81%	21%
5.8111	9.27	25%	100%	19%

**Table B-1i. South32 Clark Drilling Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	1.30E-03	<2.5	2.20	0.2967516	0.63	1
10	2.08E-03	10-2.5	9.27	1.76E-01	0.37	N/A
30	4.39E-03	30-10	--	5.27E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
4.56E-07	9.75E-05	1.06E-03

lb/hr	Mean Particle Size	% of Emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.0013	2.20	29%	64%	64%
0.0015	4.29	34%	74%	10%
0.0017	6.06	38%	83%	9%
0.0018	7.77	42%	92%	9%
0.0020	9.27	46%	100%	8%

**Table B-1j. South32 Clark Blasting Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	1.05E-01	<2.5	2.20	0.1242997	0.23903794	1
10	4.37E-01	10-2.5	9.27	3.96E-01	0.37258206	N/A
30	8.41E-01	30-10	--	4.80E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-8.79E-04	5.54E-02	-2.84E-02

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.09	2.20	11%	22%	22%
0.19	4.29	23%	47%	25%
0.27	6.06	33%	67%	20%
0.35	7.77	41%	85%	18%
0.41	9.27	49%	100%	15%

**Table B-1k. South32 Clark Underground Drop Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	6.11E-05	<2.5	2.20	0.2967516	0.62741768	1
10	9.73E-05	10-2.5	9.27	1.76E-01	0.37258232	N/A
30	2.06E-04	30-10	--	5.27E-01	N/A	N/A

\* The particle size multiplier for all Clark underground drop points is the same, therefore one emission source is used in the table above as a representative sample.

Linear Regression (2nd degree)		
a	b	y
2.14E-08	4.57E-06	4.95E-05

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.0001	2.20	29%	64%	64%
0.0001	4.29	34%	74%	10%
0.0001	6.06	38%	83%	9%
0.0001	7.77	42%	92%	9%
0.0001	9.27	46%	100%	8%

**Table B-1l. South32 Clark Underground Unpaved Roads Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
				Modeling Mass Fraction	Modeling Mass Fraction	Modeling Mass Fraction
2.5	5.77E-01	<2.5	2.20	2.58E-02	0.1	1
10	5.77E+00	10-2.5	9.27	2.32E-01	0.9	N/A
30	2.24E+01	30-10	--	7.42E-01	N/A	N/A

\* The particle size multiplier for all Clark underground roads is the same, therefore one emission source is used in the table above as a representative sample.

Linear Regression (2nd degree)		
a	b	y
5.00E-03	6.30E-01	-1.03E+00

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.38	2.20	2%	7%	7%
1.77	4.29	8%	34%	26%
2.97	6.06	13%	57%	23%
4.17	7.77	19%	80%	23%
5.24	9.27	23%	100%	20%

**Mine Development  
Particle Size Distribution**

**Table B-1m. South32 Clark Underground Emissions - ALL**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	6.83E-01	<2.5	2.20	2.94E-02	0.109967	1
10	6.21E+00	10-2.5	9.27	2.38E-01	0.890033	N/A
30	2.32E+01	30-10	--	7.33E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
4.12E-03	6.86E-01	-1.06E+00

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.4752	2.20	2%	8%	8%
1.9639	4.29	8%	35%	26%
3.2471	6.06	14%	57%	23%
4.5243	7.77	19%	80%	23%
5.6556	9.27	24%	100%	20%

**Table B-1n. South32 Taylor Pebble Crusher Secondary Crushing Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	2.20E-02	<2.5	2.20	8.33E-02	0.19	1
10	1.19E-01	10-2.5	9.27	3.67E-01	N/A	N/A
30	2.64E-01	30-10	--	5.50E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-2.05E-04	1.55E-02	-1.54E-02

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.02	2.20	7%	16%	16%
0.05	4.29	18%	43%	27%
0.07	6.06	27%	64%	21%
0.09	7.77	35%	84%	20%
0.11	9.27	42%	100%	16%

**Table B-1o. South32 Clark Rock Breaker Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	1.46E-04	<2.5	2.20	7.16E-02	0.15	1
10	9.64E-04	10-2.5	9.27	4.01E-01	N/A	N/A
30	2.04E-03	30-10	--	5.27E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-2.01E-06	1.34E-04	-1.77E-04

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.0001	2.20	5%	12%	12%
0.0004	4.29	18%	41%	28%
0.0006	6.06	28%	63%	22%
0.0007	7.77	37%	83%	20%
0.0009	9.27	44%	100%	17%

**Table B-1p. South32 Hermosa Surface Activity Drops and Dust Collectors Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	5.49E-02	<2.5	2.20	1	1	1
10	5.49E-02	10-2.5	9.27	0.00E+00	0	N/A
30	5.49E-02	30-10	--	0.00E+00	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
0.00E+00	0.00E+00	5.49E-02

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.05	2.20	100%	100%	100%
0.05	4.29	100%	100%	0%
0.05	6.06	100%	100%	0%
0.05	7.77	100%	100%	0%
0.05	9.27	100%	100%	0%

\* The particle size multiplier for all surface activity drop points as well as the dust collectors is the same, therefore one emission source is used in the table above as a representative sample.

**Table B-1q. South32 Hermosa Wind Erosion Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	6.93E-01	<2.5	2.20	0.075	0.15	1
10	4.62E+00	10-2.5	9.27	4.25E-01	0.85	N/A
30	9.24E+00	30-10	--	5.00E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-1.06E-02	6.57E-01	-8.82E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.51	2.20	6%	12%	12%
1.74	4.29	19%	41%	29%
2.70	6.06	29%	63%	22%
3.58	7.77	39%	83%	20%
4.29	9.27	46%	100%	17%

\* The particle size multiplier for wind erosion across all stockpiles is the same, therefore one emission source is used in the table above as a representative sample.

**Table B-1r. South32 Hermosa Generator Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	7.88	<2.5	2.20	1.00	1.00	1
10	7.88	10-2.5	9.27	0.00	0.00	N/A
30	7.88	30-10	--	0.00	N/A	N/A

Linear Regression (2nd degree)		
y	a	b
0.00E+00	0.00E+00	7.88E+00

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
7.88	2.20	100%	100%	100%
7.88	4.29	100%	100%	0%
7.88	6.06	100%	100%	0%
7.88	7.77	100%	100%	0%
7.88	9.27	100%	100%	0%

\*\* PM10 = PM2.5 emissions, thus all PM10 emissions are conservatively assumed to be PM2.5.

\*\* The particle size multiplier for all natural gas generators is the same, therefore one emission source is used in the table above as a representative sample.

**Mine Development  
Particle Size Distribution**

**Table B-1s. South32 Hermosa WTP2 Cooling Towers Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	9.29E-05	<2.5	2.20	0.0183303	0.01994903	1
10	4.66E-03	10-2.5	9.27	9.01E-01	0.98005097	N/A
30	5.07E-03	30-10	--	8.11E-02	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-2.14E-05	8.76E-04	-1.96E-03

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.000	2.20	-3%	-3%	-3%
0.001	4.29	28%	32%	36%
0.003	6.06	50%	59%	27%
0.004	7.77	70%	82%	23%
0.004	9.27	85%	100%	18%

**Table B-1t. South32 Hermosa CBP Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	6.47E-02	<2.5	2.20	0.3985271	1	1
10	6.47E-02	10-2.5	9.27	0.00E+00	0	N/A
30	1.62E-01	30-10	--	6.01E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
1.78E-04	-2.22E-03	6.91E-02

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.07	2.20	40%	102%	102%
0.06	4.29	39%	99%	-3%
0.06	6.06	38%	97%	-1%
0.06	7.77	39%	98%	1%
0.06	9.27	39%	100%	2%

\* PM10 = PM2.5 emissions, thus all PM10 emissions are conservatively assumed to be PM2.5.

\*\* The particle size multiplier for all concrete batch plant activities is the same, therefore one emission source is used in the table above as a representative sample.

\*PM10 = PM2.5 emissions, thus all PM10 emissions are conservatively assumed to be PM2.5.

**Table B-1u. South32 Hermosa Refrigeration Cooling Tower Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	2.14E-03	<2.5	2.20	0.1814117	0.34868017	1
10	6.13E-03	10-2.5	9.27	3.39E-01	0.65131983	N/A
30	1.18E-02	30-10	--	4.80E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
-9.08E-06	6.46E-04	5.80E-04

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.00	2.20	17%	34%	34%
0.00	4.29	27%	55%	21%
0.00	6.06	35%	72%	17%
0.01	7.77	43%	87%	15%
0.01	9.27	49%	100%	13%

\*\* The particle size multiplier for both refrigeration sources is the same, therefore one emission source is used in the table above as a representative sample.

**Table B-1v. South32 Hermosa Dozer - TSF and OTSF**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	4.71E-01	<2.5	2.20	0.105	0.49399705	1
10	9.53E-01	10-2.5	9.27	1.08E-01	0.50600295	N/A
30	4.48E+00	30-10	--	7.87E-01	N/A	N/A

Linear Regression (2nd degree)		
a	b	y
4.08E-03	1.33E-02	4.12E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.46	2.20	10%	52%	52%
0.54	4.29	12%	61%	9%
0.64	6.06	14%	72%	11%
0.76	7.77	17%	86%	14%
0.89	9.27	20%	100%	14%

\* The particle size multiplier for all TSF and OTSF dozer emissions is the same, therefore one emission source is used in the table above as a representative sample.

**Table B-1w. South32 Hermosa Dozer - Rock**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	5.21E-02	<2.5	2.20	1.05E-01	0.79610966	1
10	6.54E-02	10-2.5	9.27	2.69E-02	0.20389034	N/A
30	4.96E-01	30-10	--	8.68E-01	N/A	N/A

Linear Regression (1st degree)		
a	b	y
1.78E-03	4.76E-02	

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.0515	2.20	10%	80%	80%
0.0552	4.29	11%	86%	6%
0.0584	6.06	12%	91%	5%
0.0614	7.77	12%	96%	5%
0.0641	9.27	13%	100%	4%

\* The particle size multiplier for all rock dozer emissions is the same, therefore one emission source is used in the table above as a representative sample.

\*\*Due to difference in PM10 and PM2.5 emissions, 1st degree linear regression was used for this emission source.



**Mine Development  
Particle Size Distribution**

**Table B-1x. South32 Hermosa Mechanical Evaporation Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	1.36E-02	<2.5	2.20	0.1488834	0.14888337	1
10	9.11E-02	10-2.5	9.27	8.51E-01	0.85111663	N/A
30	9.11E-02	30-10	--	0.00E+00	N/A	N/A

\* The particle size multiplier for all evaporators is the same, therefore one emission source is used in the table above as a representative sample.

Linear Regression (2nd degree)		
a	b	y
-3.76E-04	1.50E-02	-2.17E-02

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.01	2.20	11%	11%	11%
0.04	4.29	39%	42%	31%
0.06	6.06	61%	65%	23%
0.07	7.77	80%	85%	20%
0.09	9.27	94%	100%	15%

**Table B-1y. South32 Hermosa Aboveground Unpaved Roads Emissions**

Particle Size	Particle Size Multiplier	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	1.50E-01	<2.5	2.20	3.06E-02	0.1	1
10	1.50E+00	10-2.5	9.27	2.76E-01	0.9	N/A
30	4.90E+00	30-10	--	6.94E-01	N/A	N/A

\* Particle Size Multiplier referenced from AP-42 Table 13.2.2-2.

\*\* The particle size multiplier for all aboveground roads is the same, therefore one emission source is used in the table above as a representative sample.

Linear Regression (2nd degree)		
a	b	y
-3.64E-04	1.85E-01	-3.09E-01

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.10	2.20	2%	7%	7%
0.48	4.29	10%	35%	28%
0.80	6.06	16%	58%	23%
1.10	7.77	23%	81%	23%
1.37	9.27	28%	100%	19%

**Table B-1z. South32 Hermosa Paste Plant Emissions**

Particle Size	Emissions (lb/hr)	Size Range	Particle Diameter (mean)	PM Modeling Mass Fraction	PM <sub>10</sub> Modeling Mass Fraction	PM <sub>2.5</sub> Modeling Mass Fraction
2.5	6.94E-04	<2.5	2.20	7.16E-02	0.20854531	1
10	3.33E-03	10-2.5	9.27	2.72E-01	0.79145469	N/A
30	9.69E-03	30-10	--	6.57E-01	N/A	N/A

\* The particle size multiplier for all paste plant operations is the same, therefore one emission source is used in the table above as a representative sample.

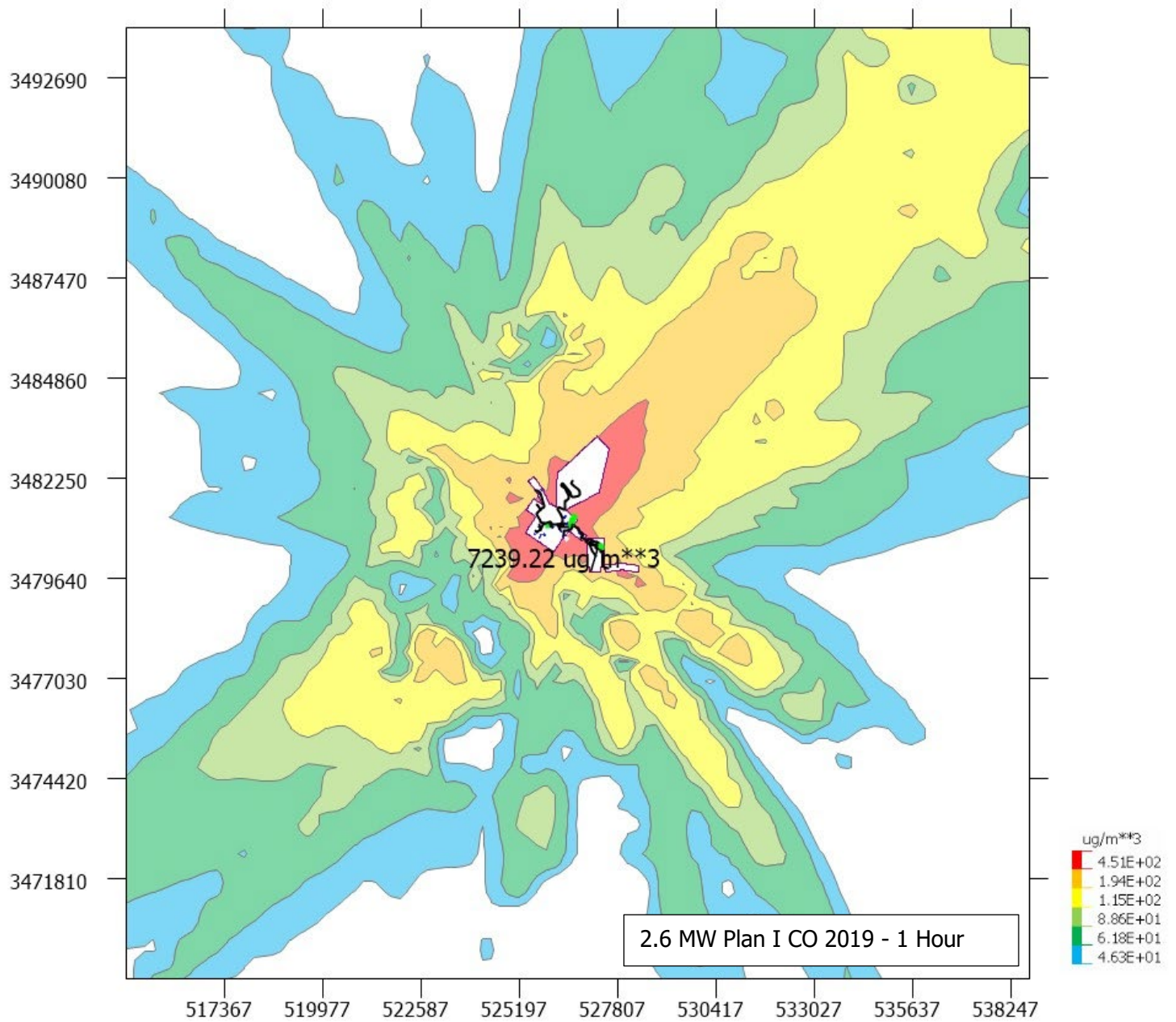
Linear Regression (2nd degree)		
a	b	y
-1.20E-06	3.66E-04	-2.14E-04

lb/hr	Mean Particle Size	% of emissions	Cumulative Distribution of Particle Sizes (%)	Particle Size Distribution
0.0006	2.20	6%	19%	19%
0.0013	4.29	14%	43%	24%
0.0020	6.06	20%	64%	20%
0.0026	7.77	26%	83%	20%
0.0031	9.27	32%	100%	17%

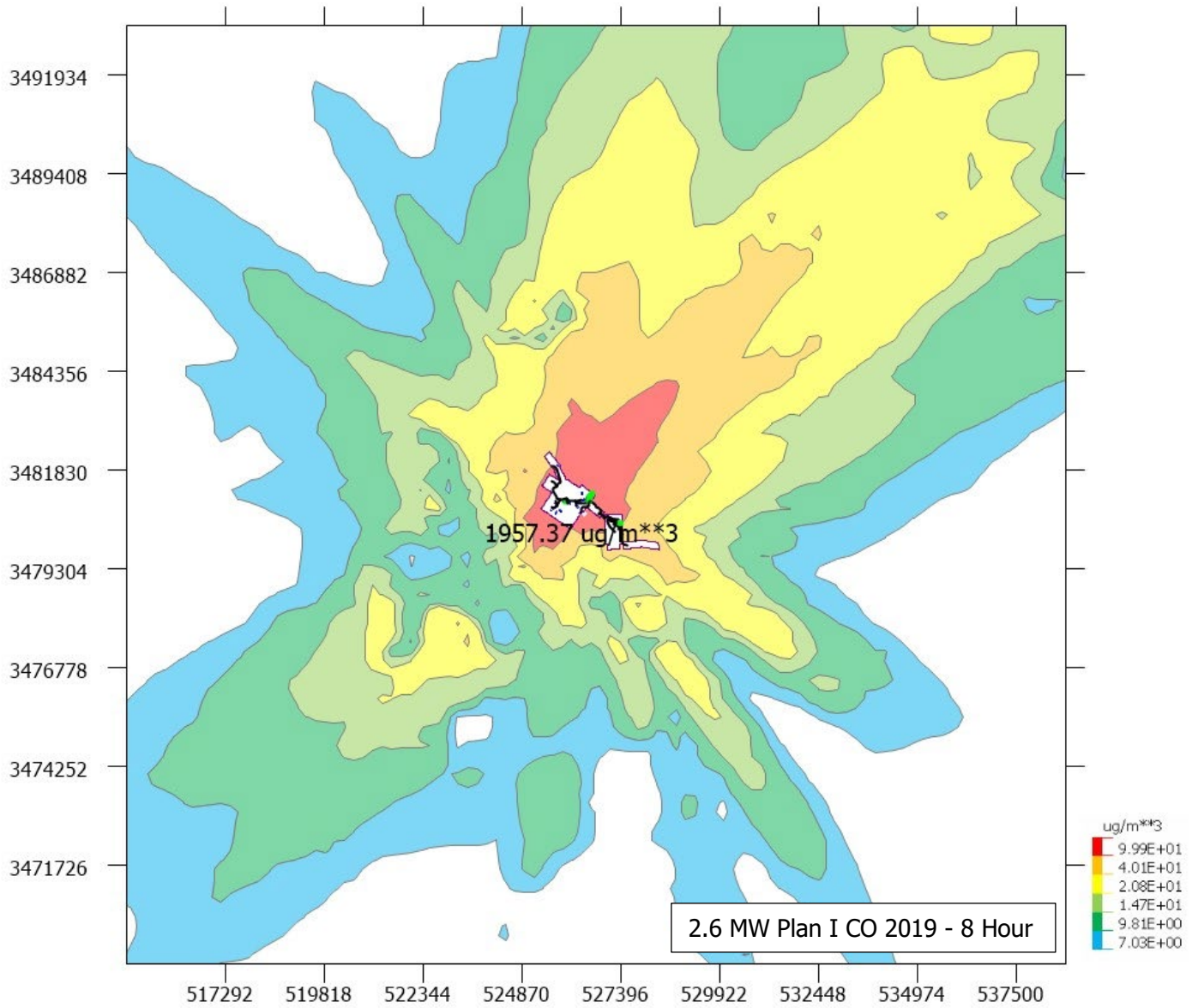
## **APPENDIX C. MODELED IMPACT CONTOUR PLOTS**

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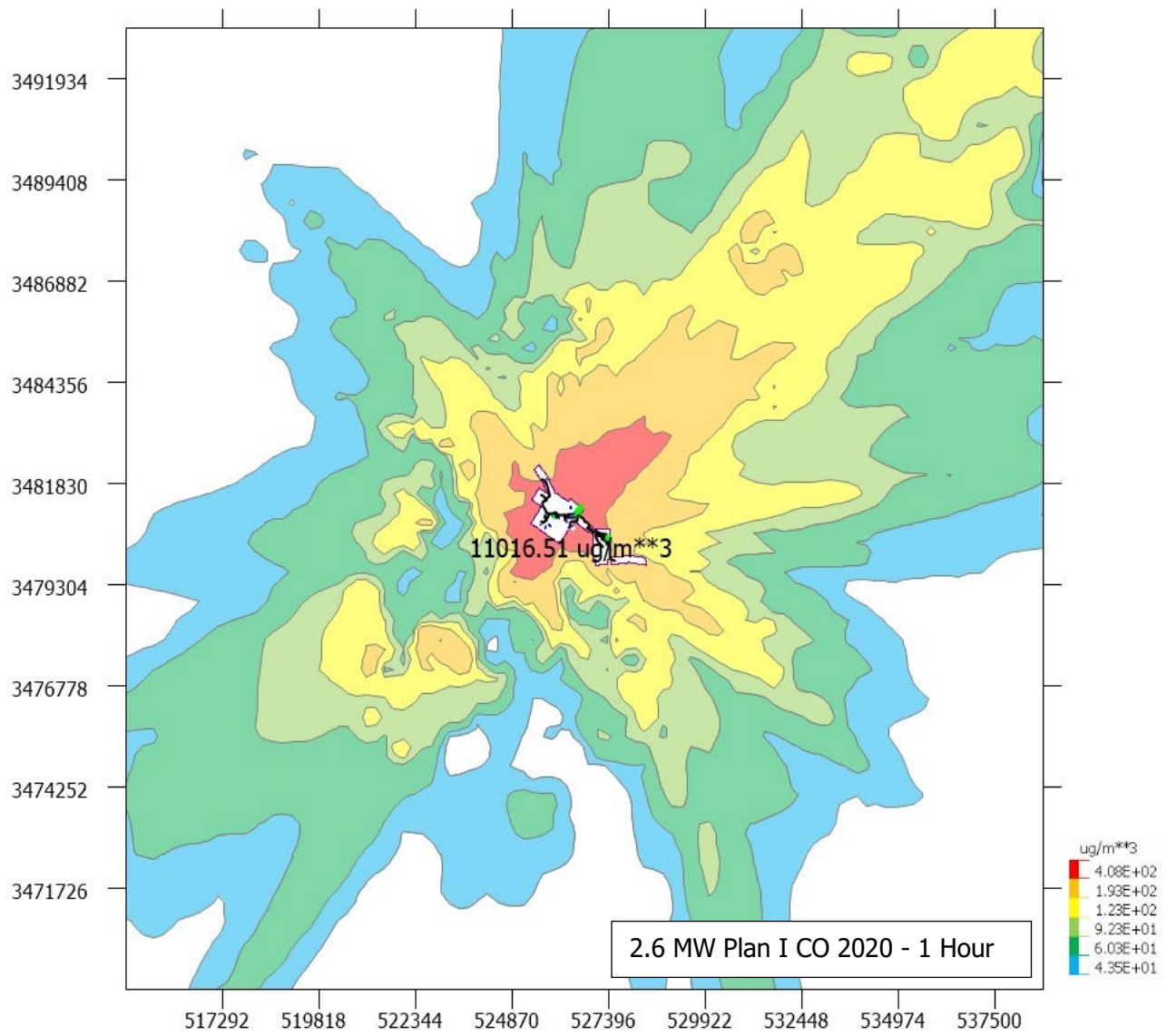
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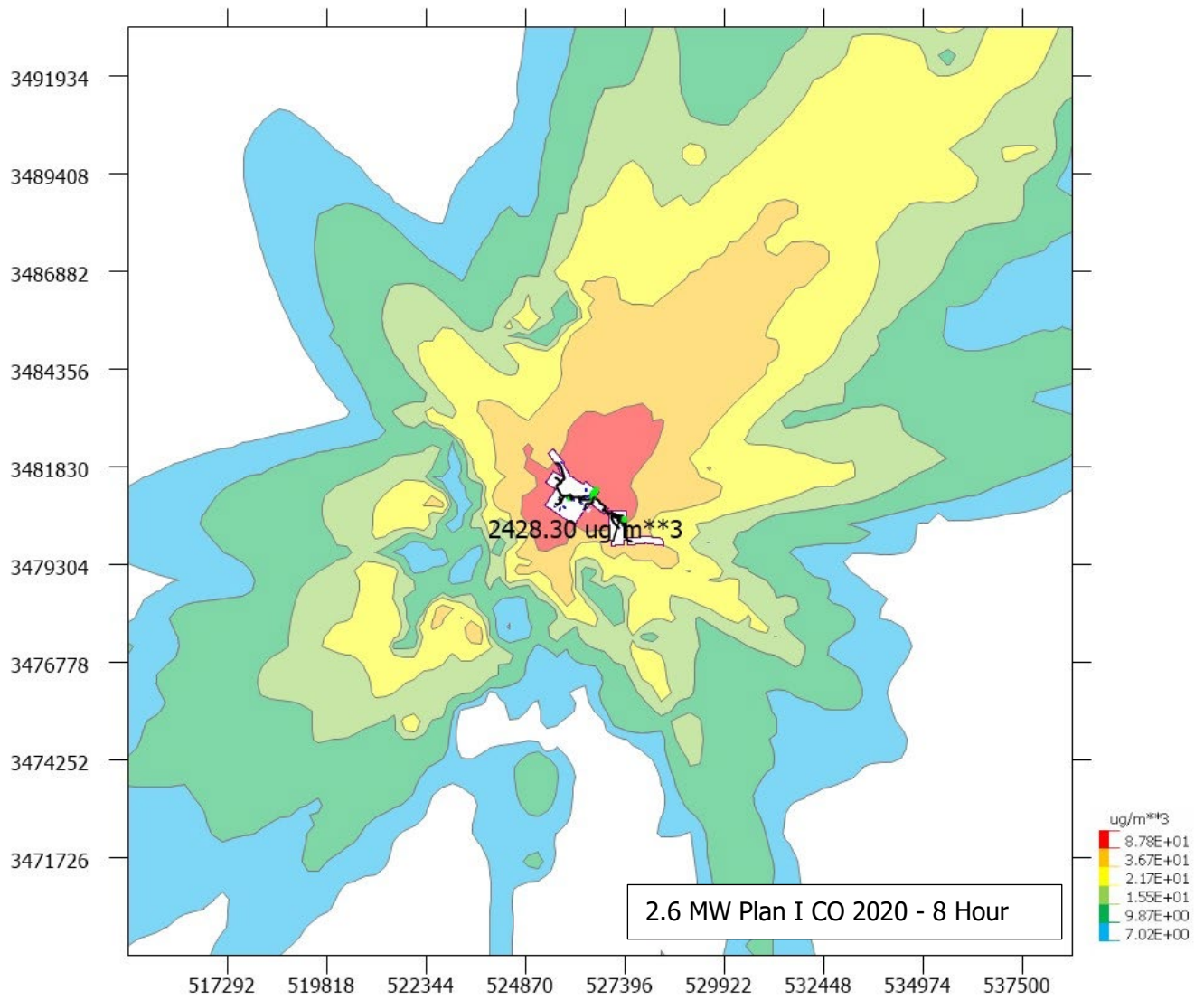
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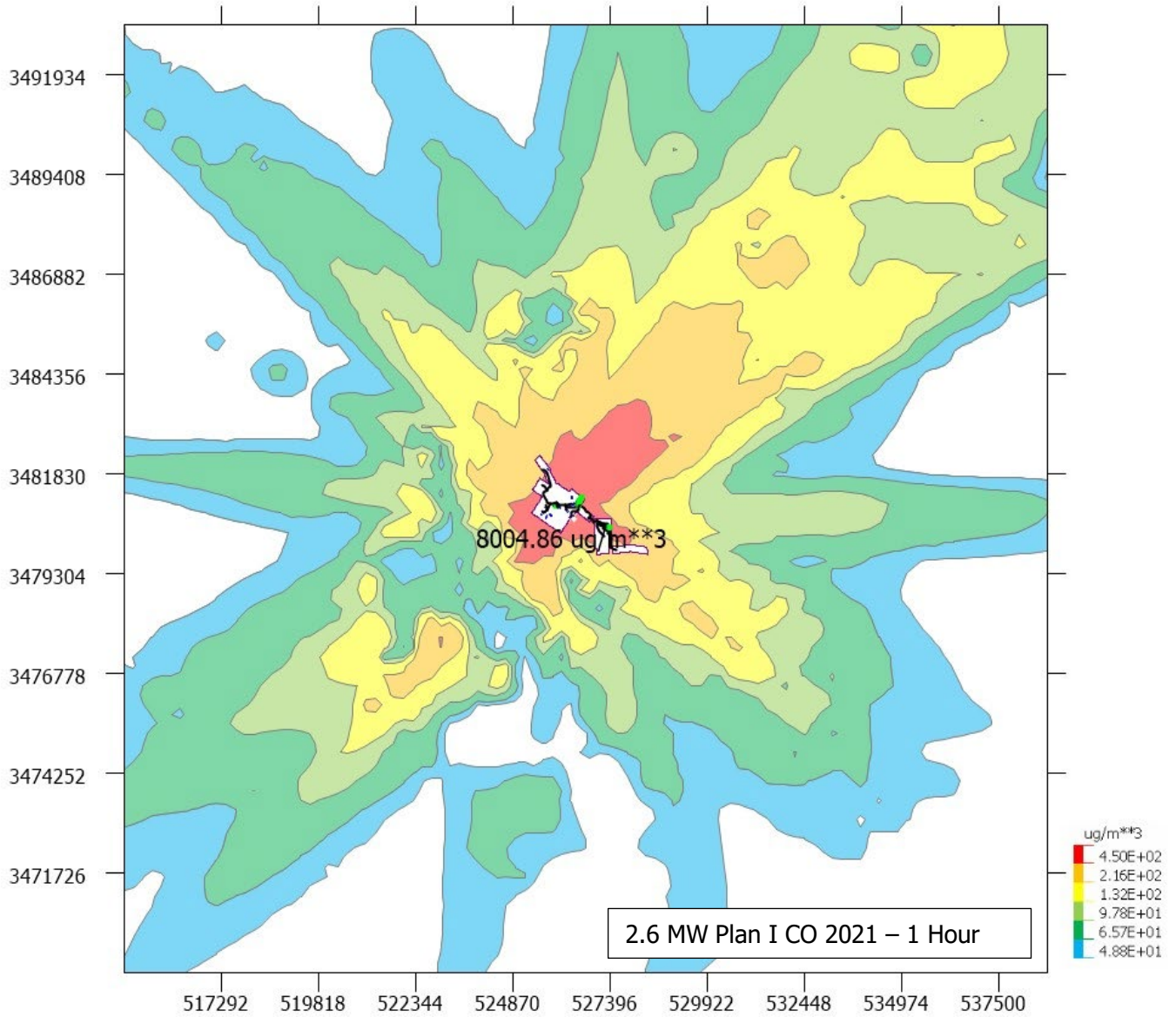
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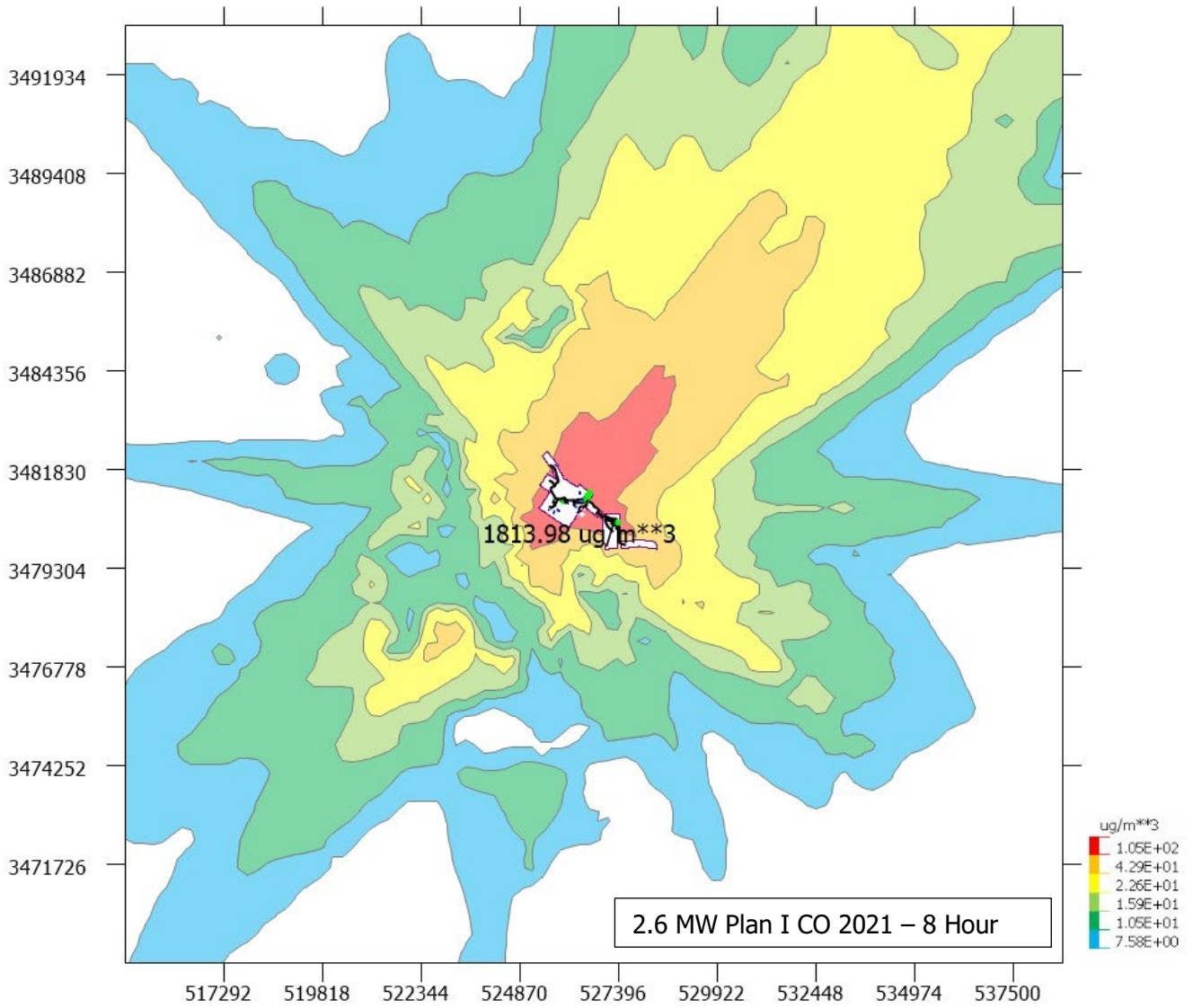
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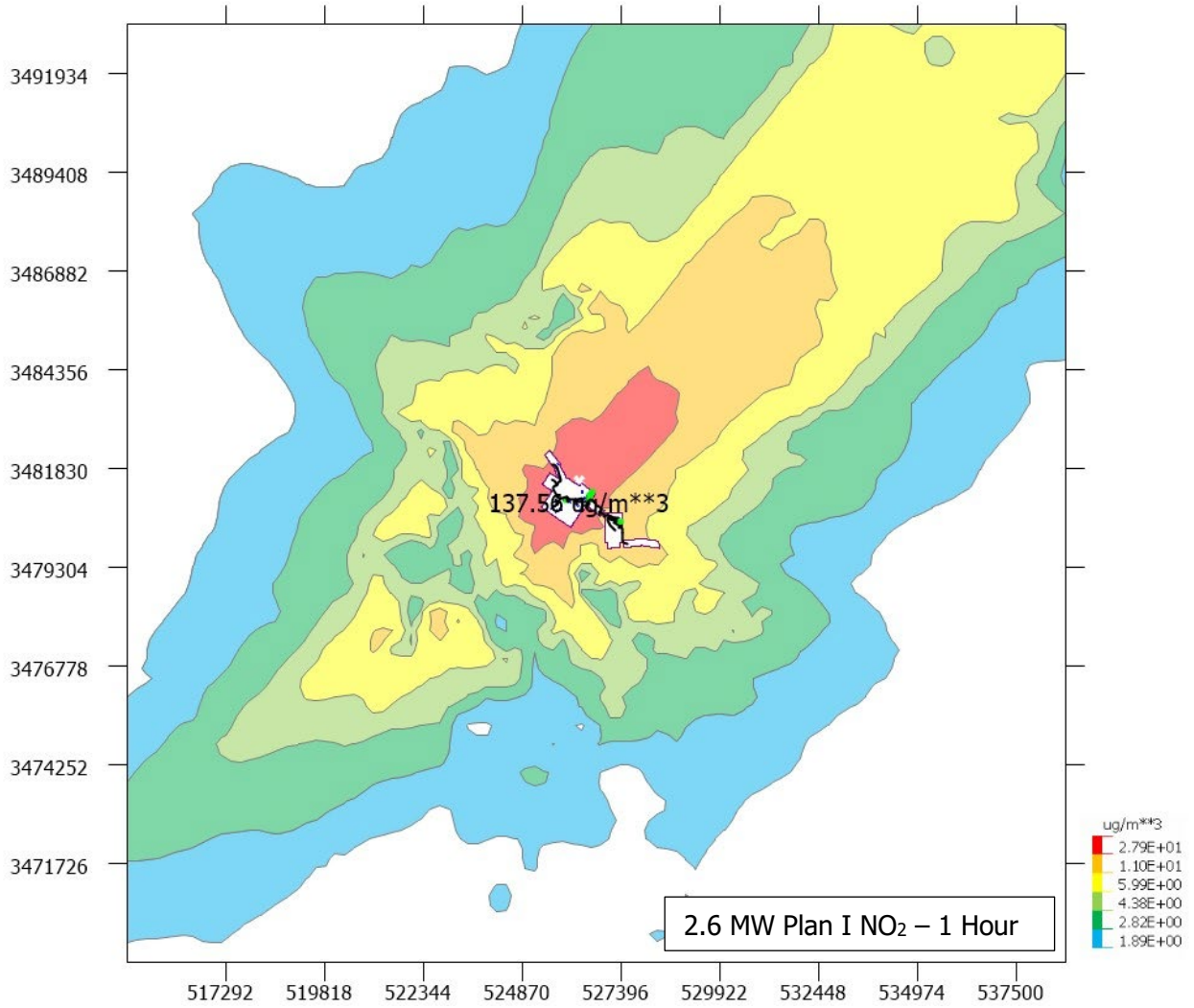


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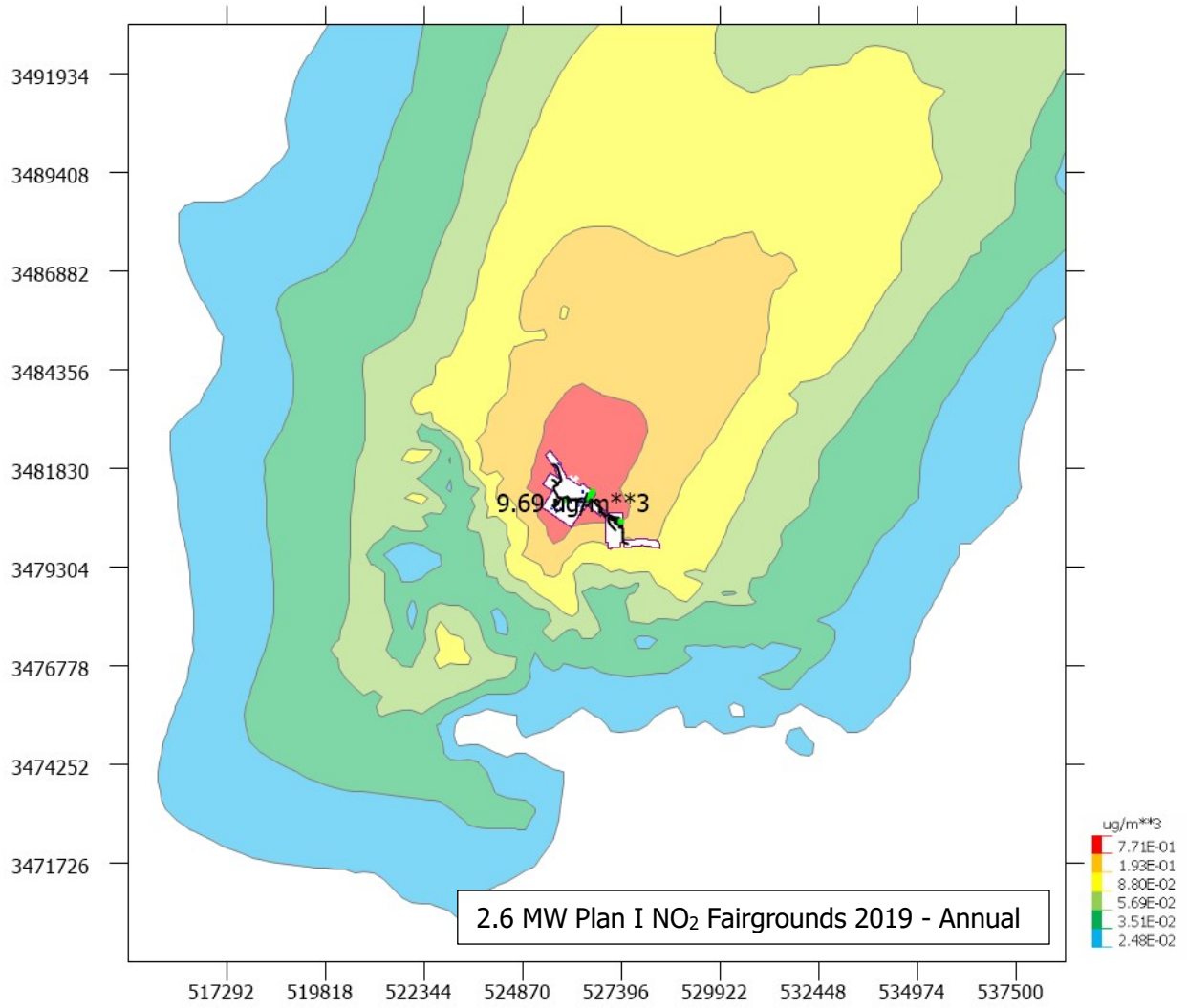




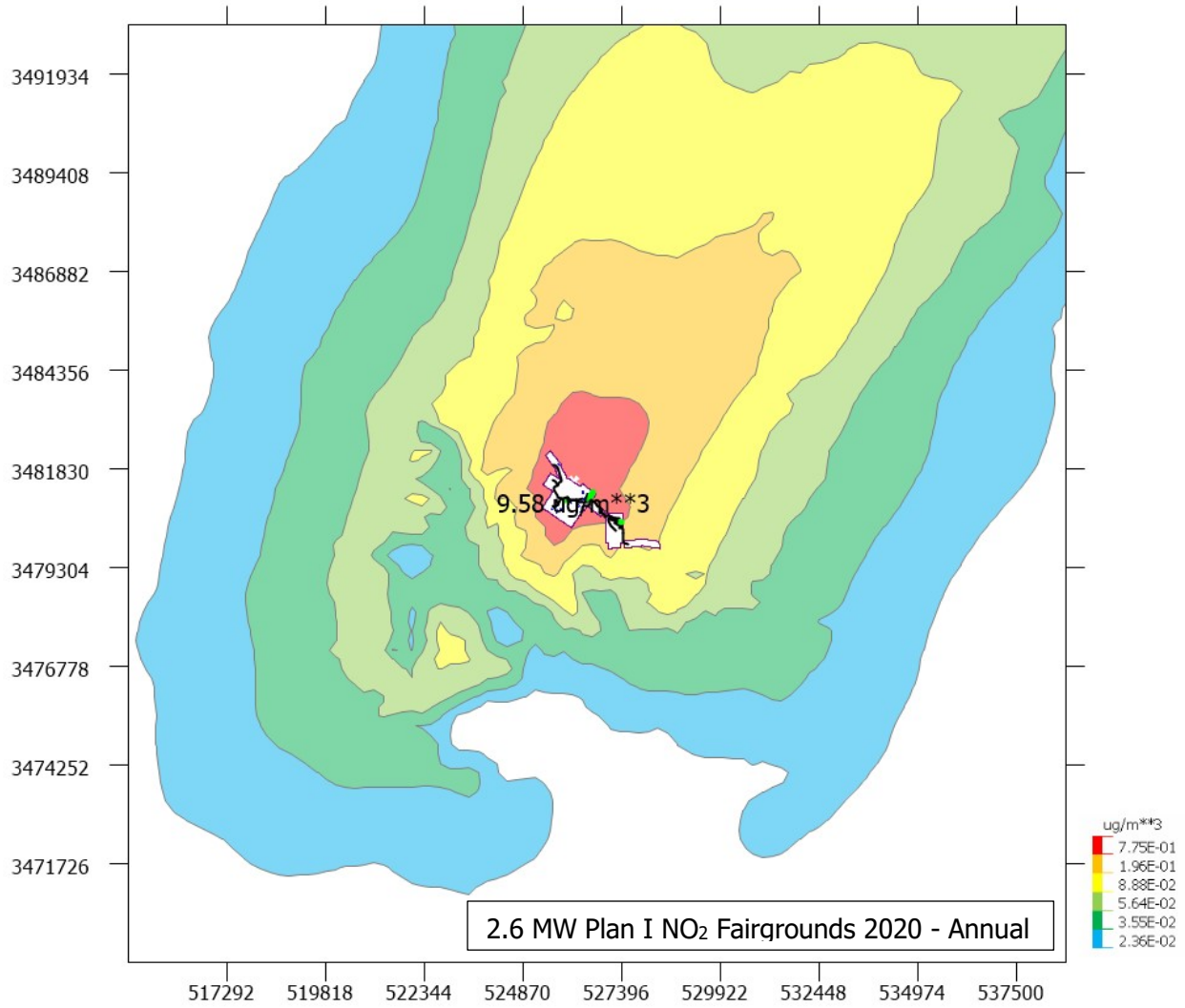
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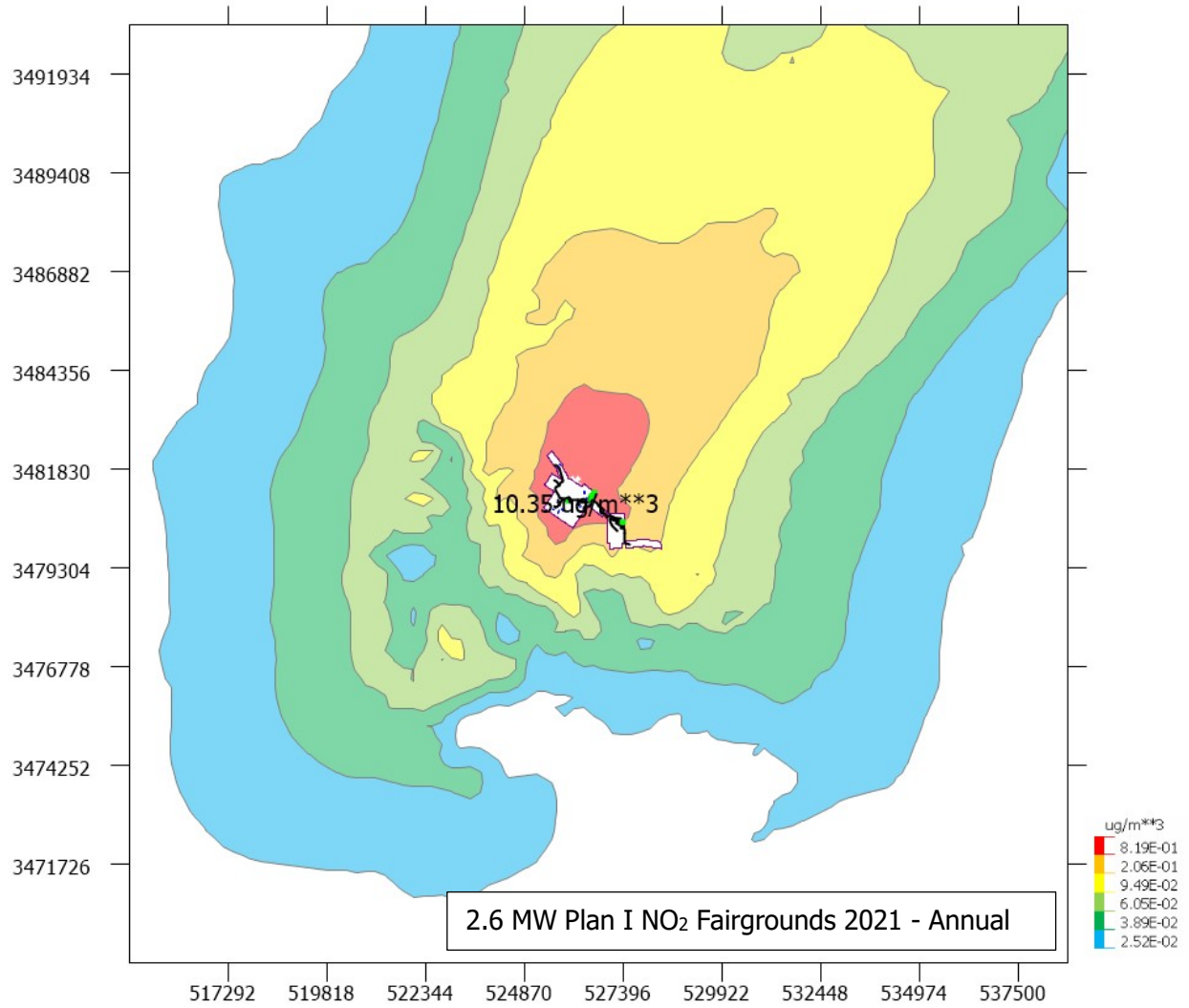
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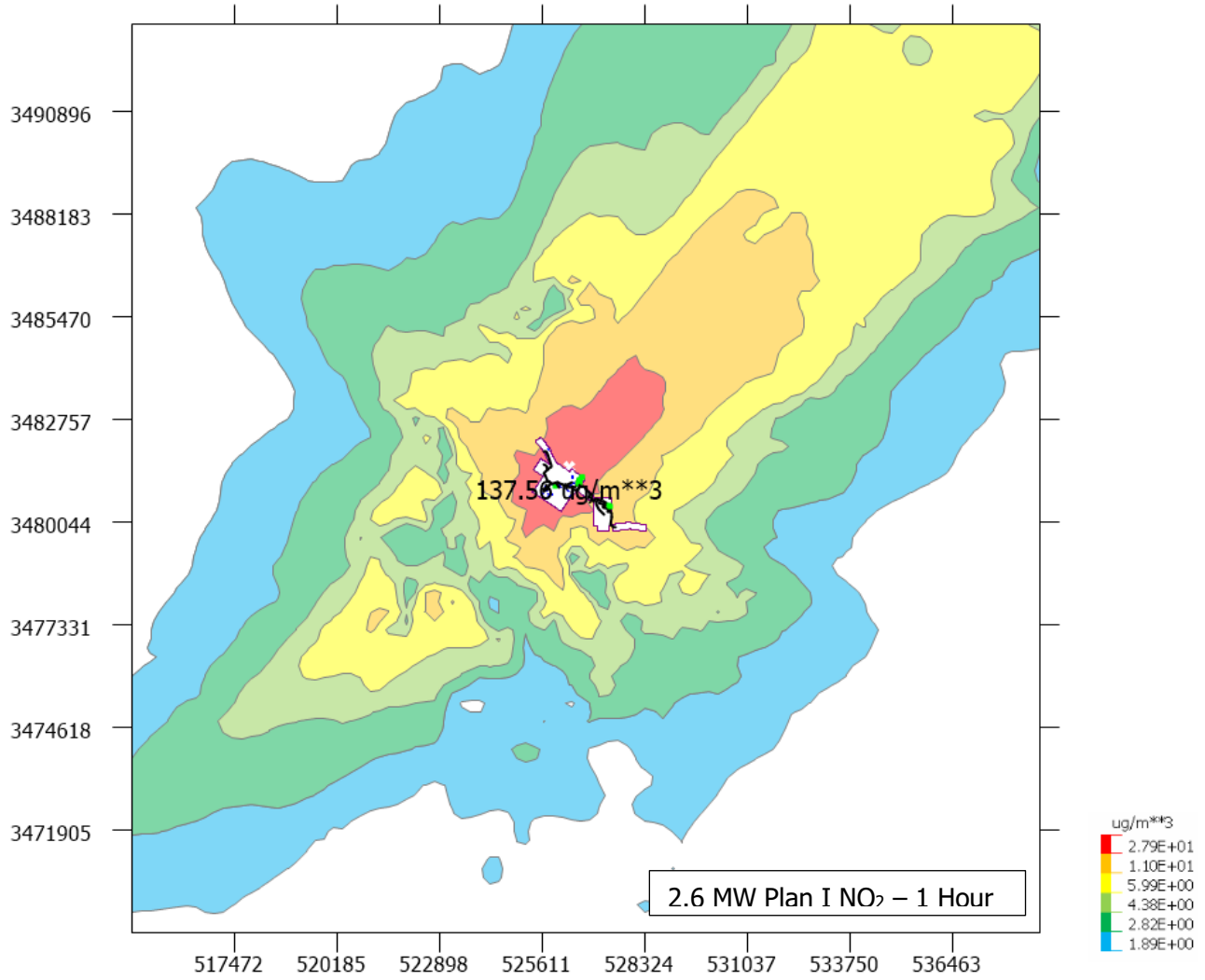
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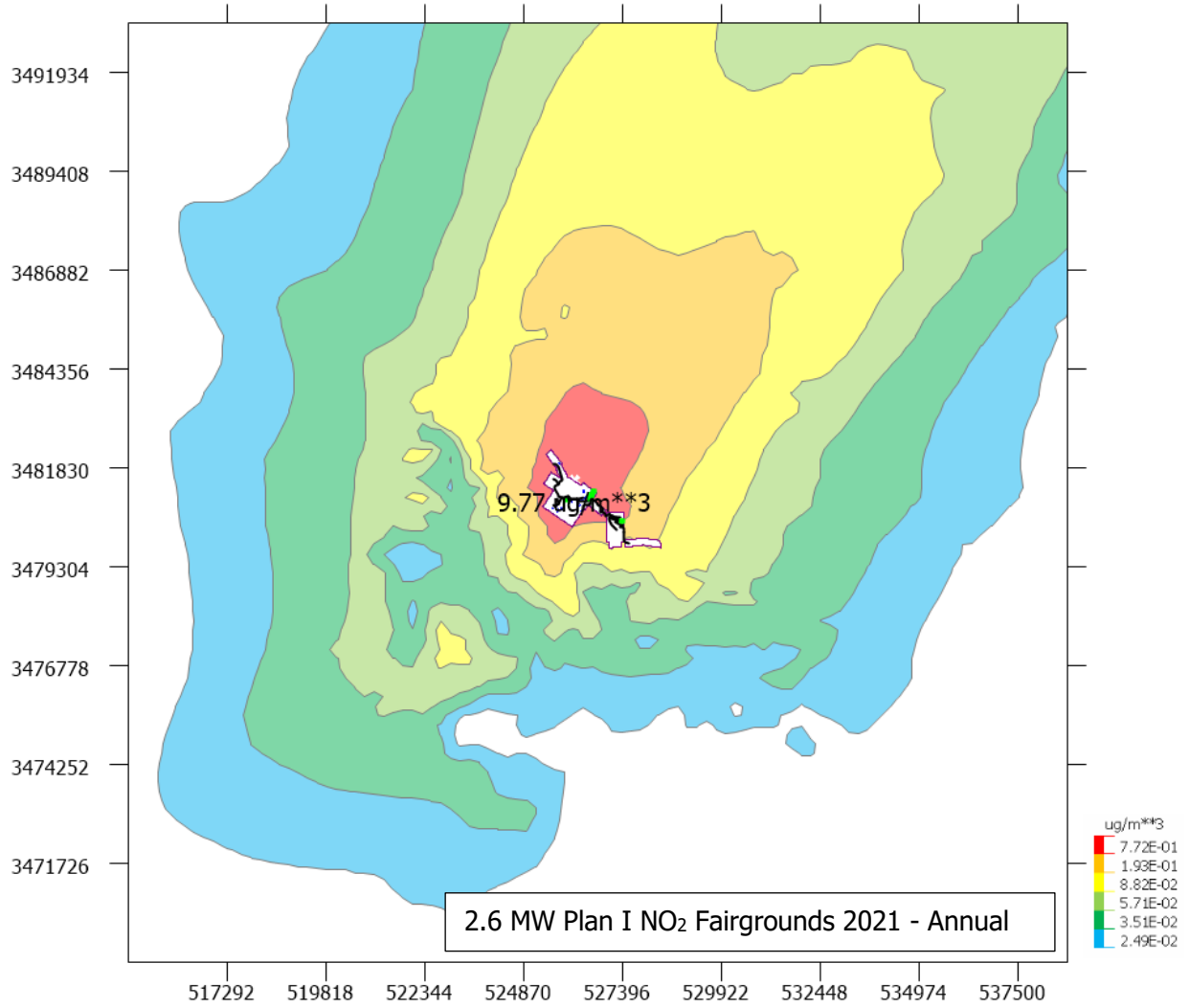
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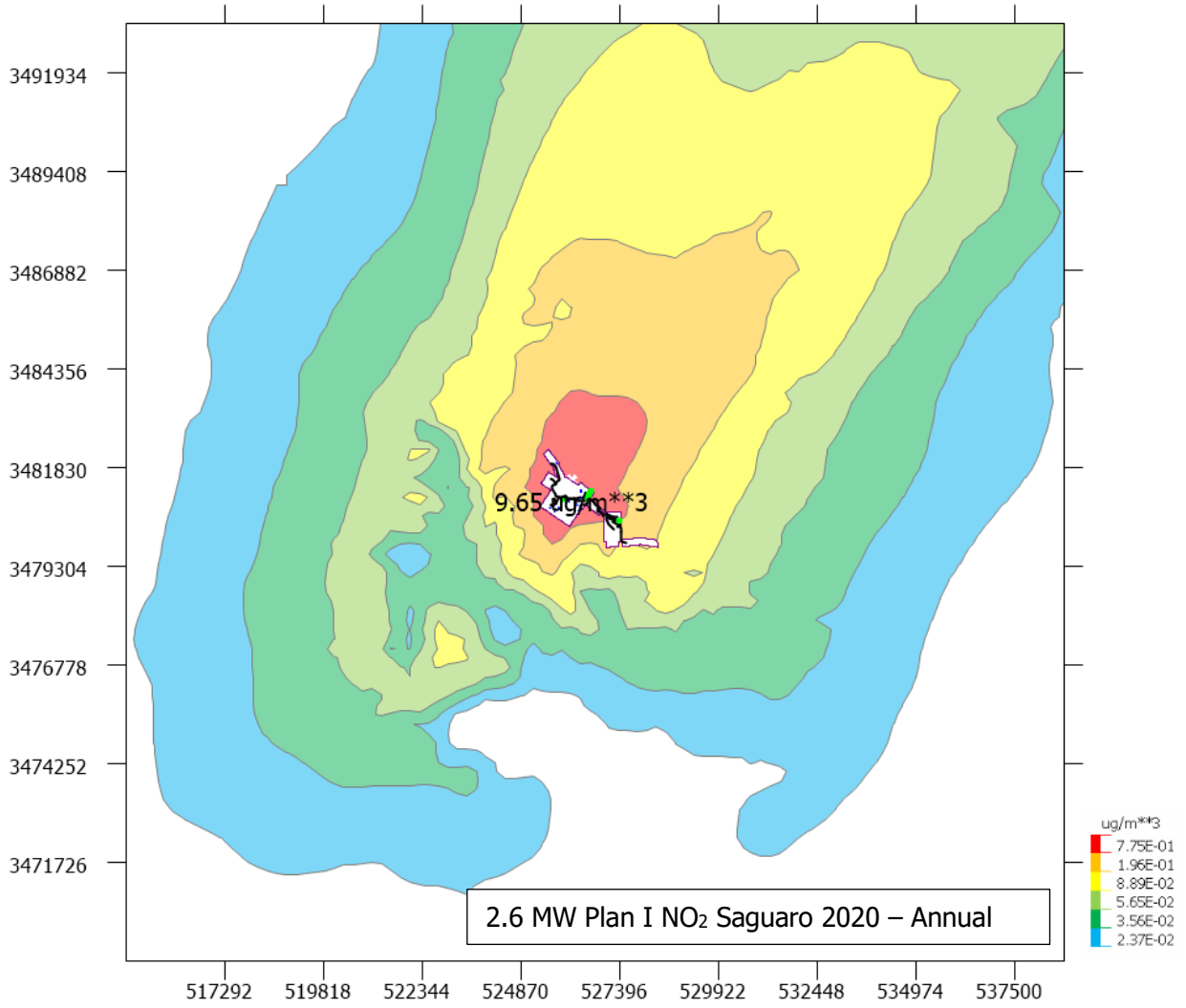
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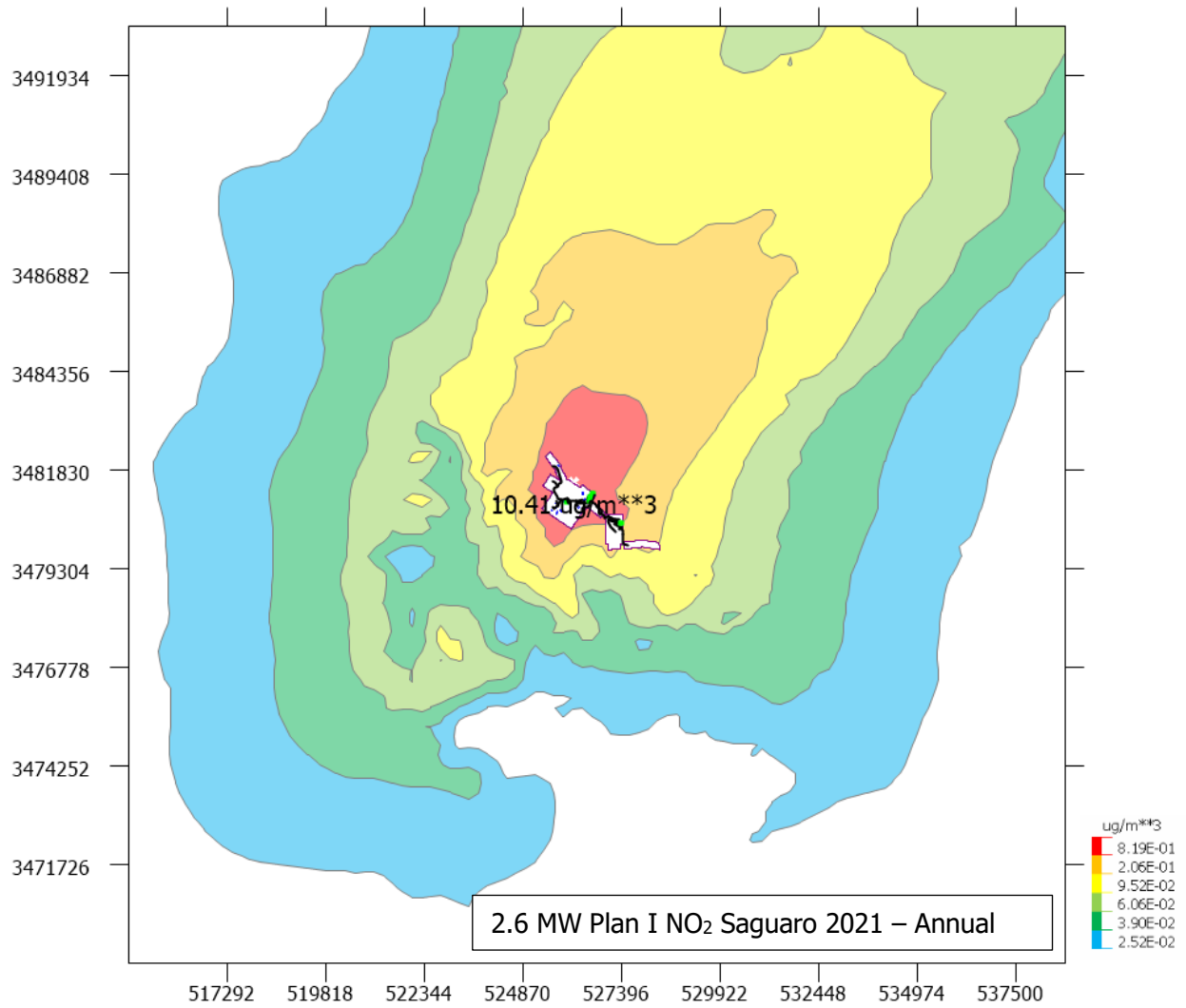
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### 2.6 MW Plan I NO<sub>2</sub> Saguaro 2020 – Annual

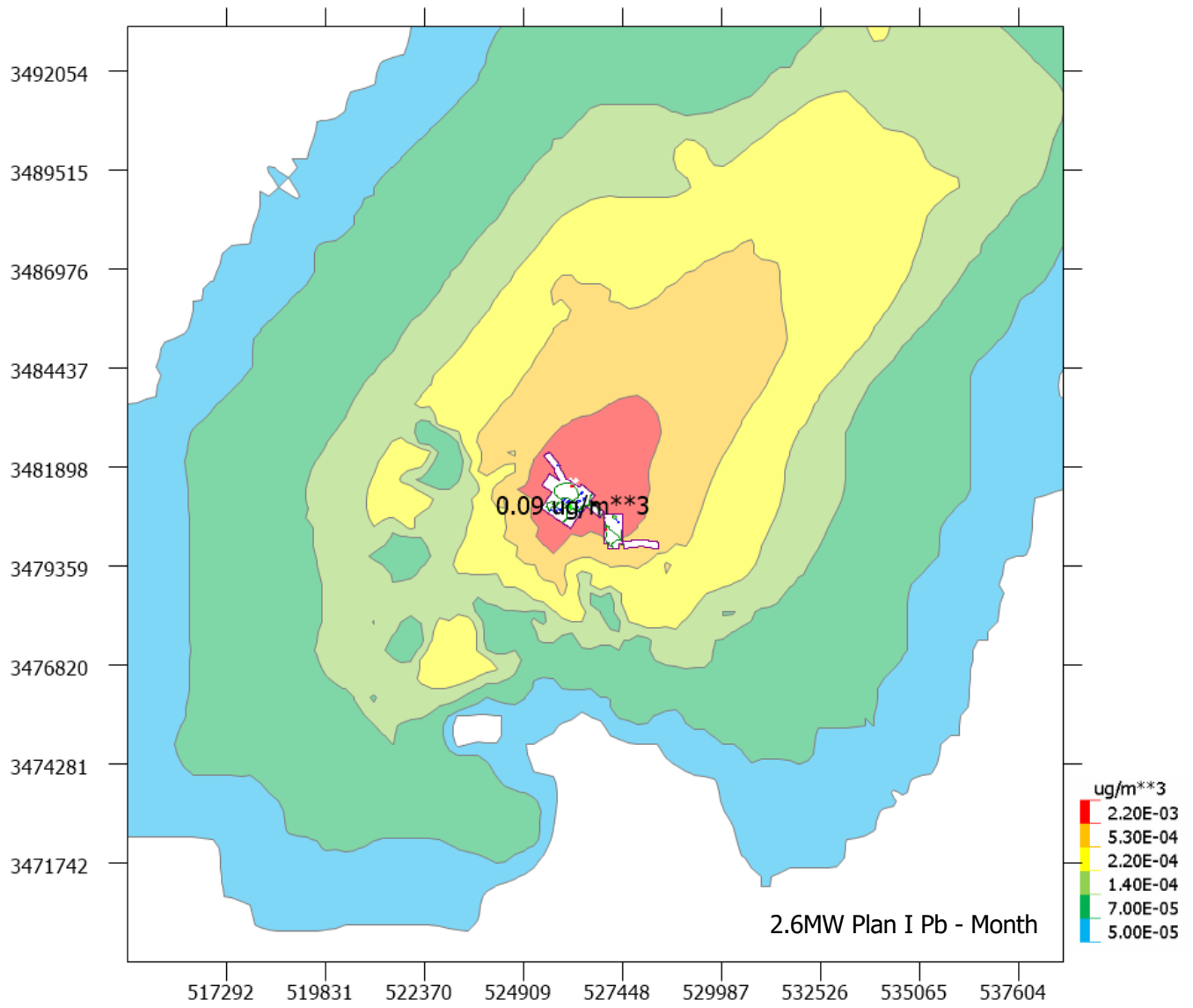


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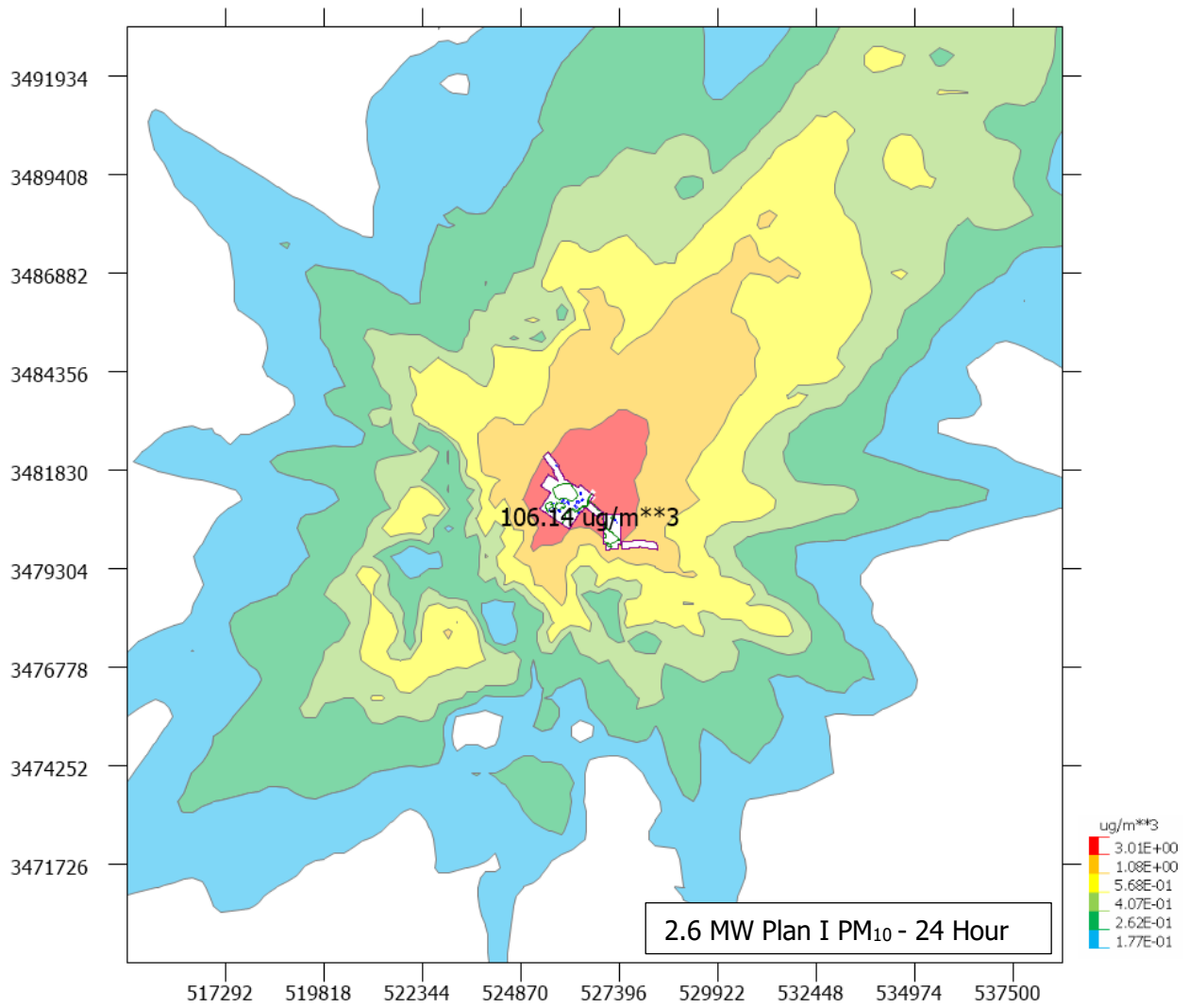




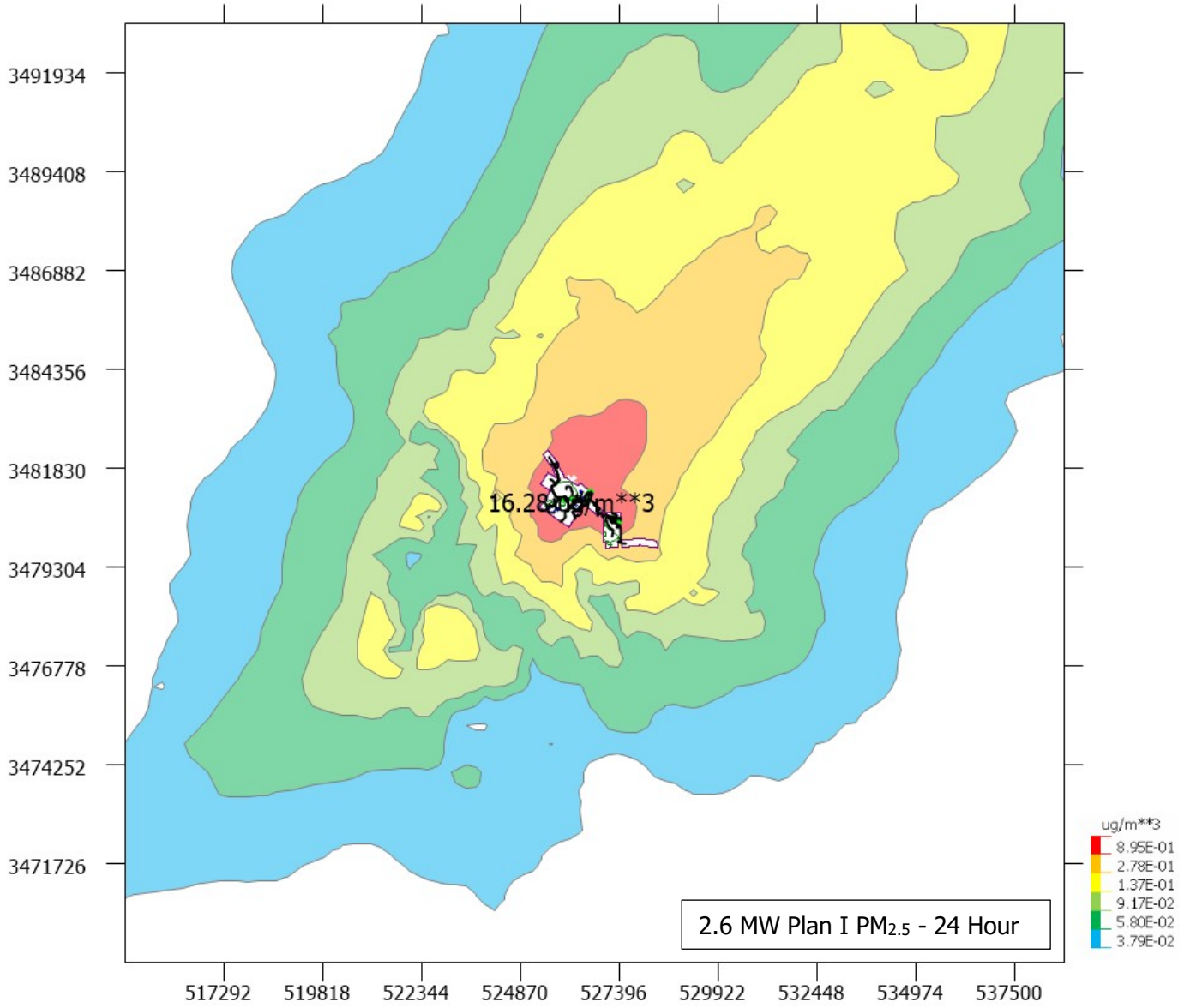
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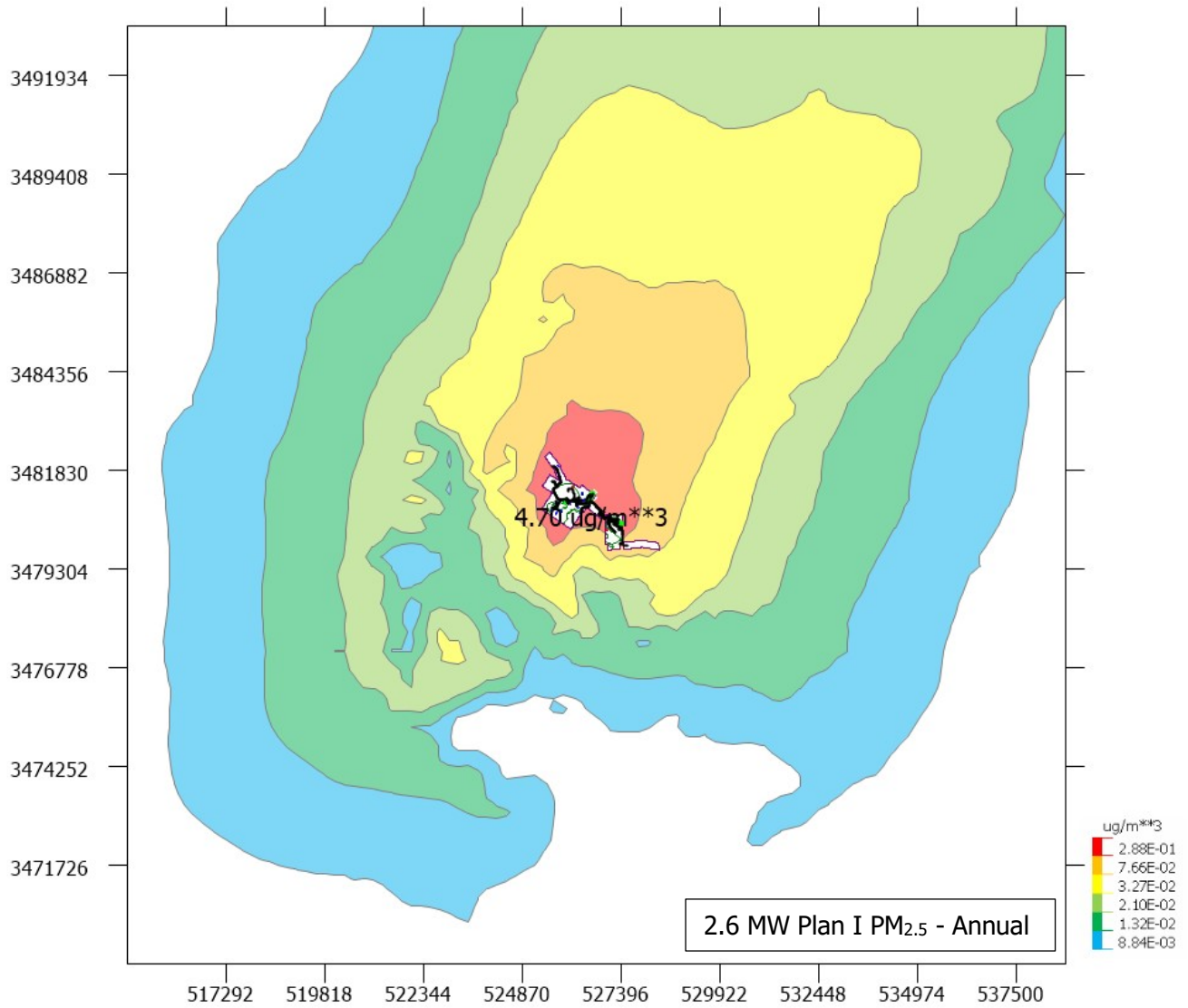
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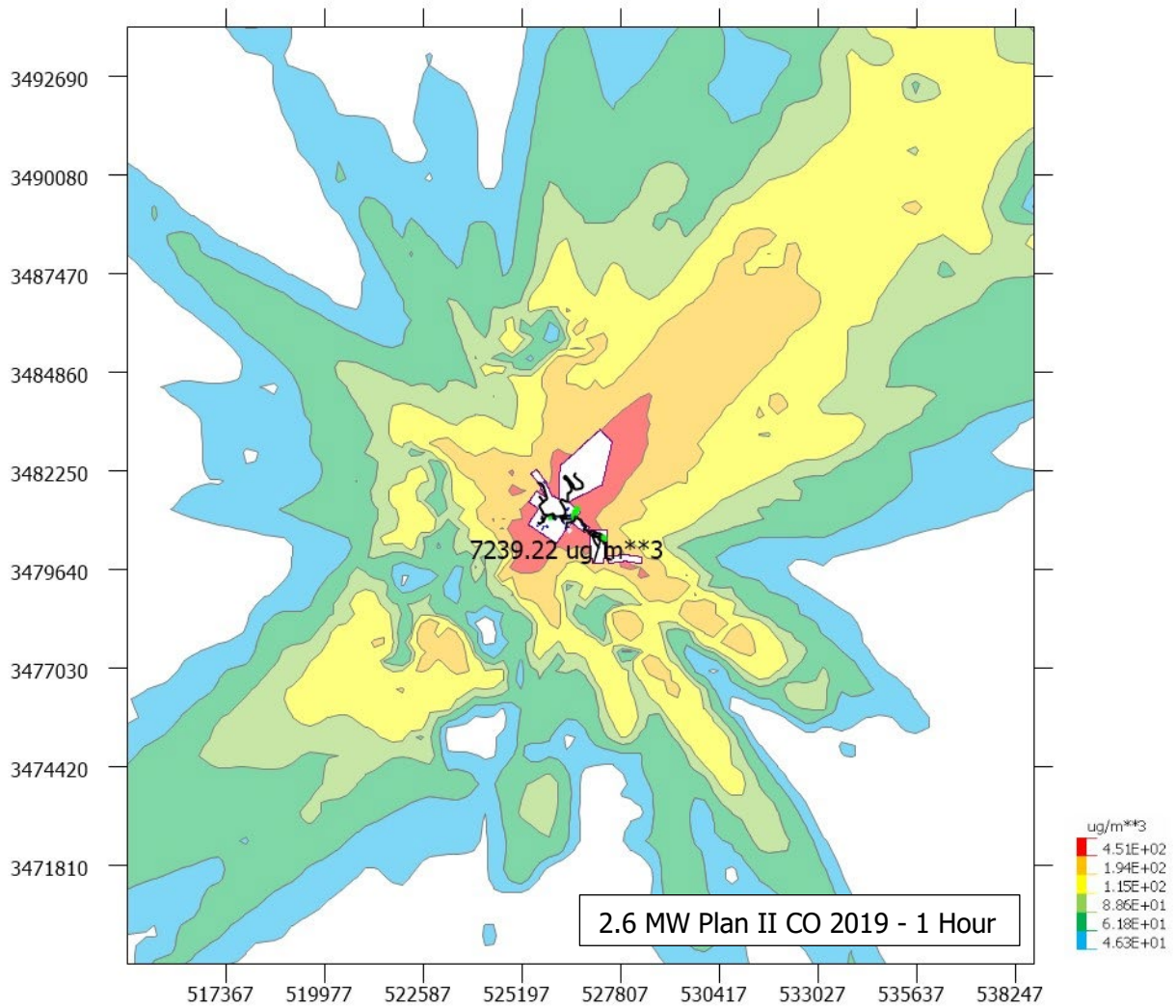
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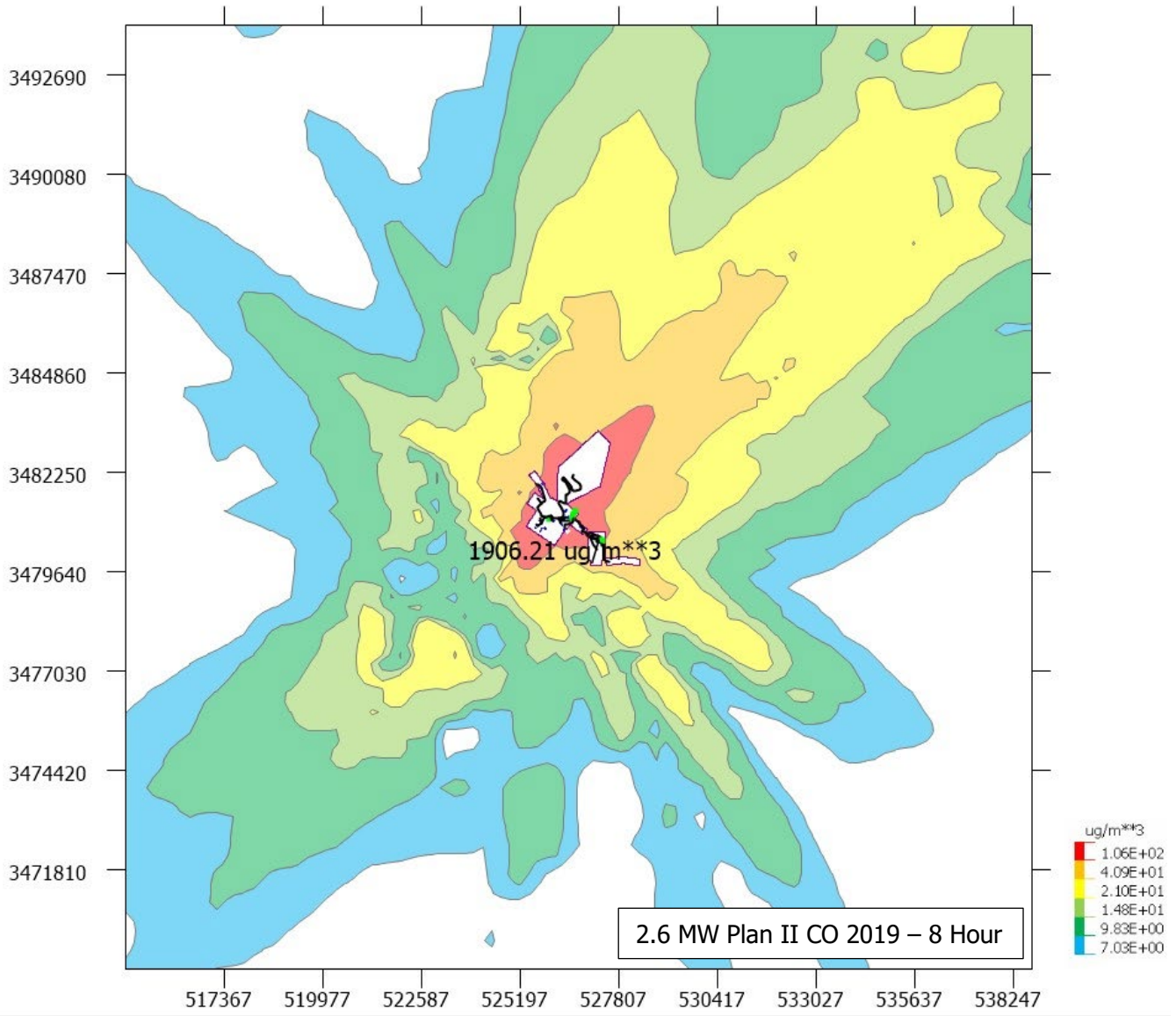
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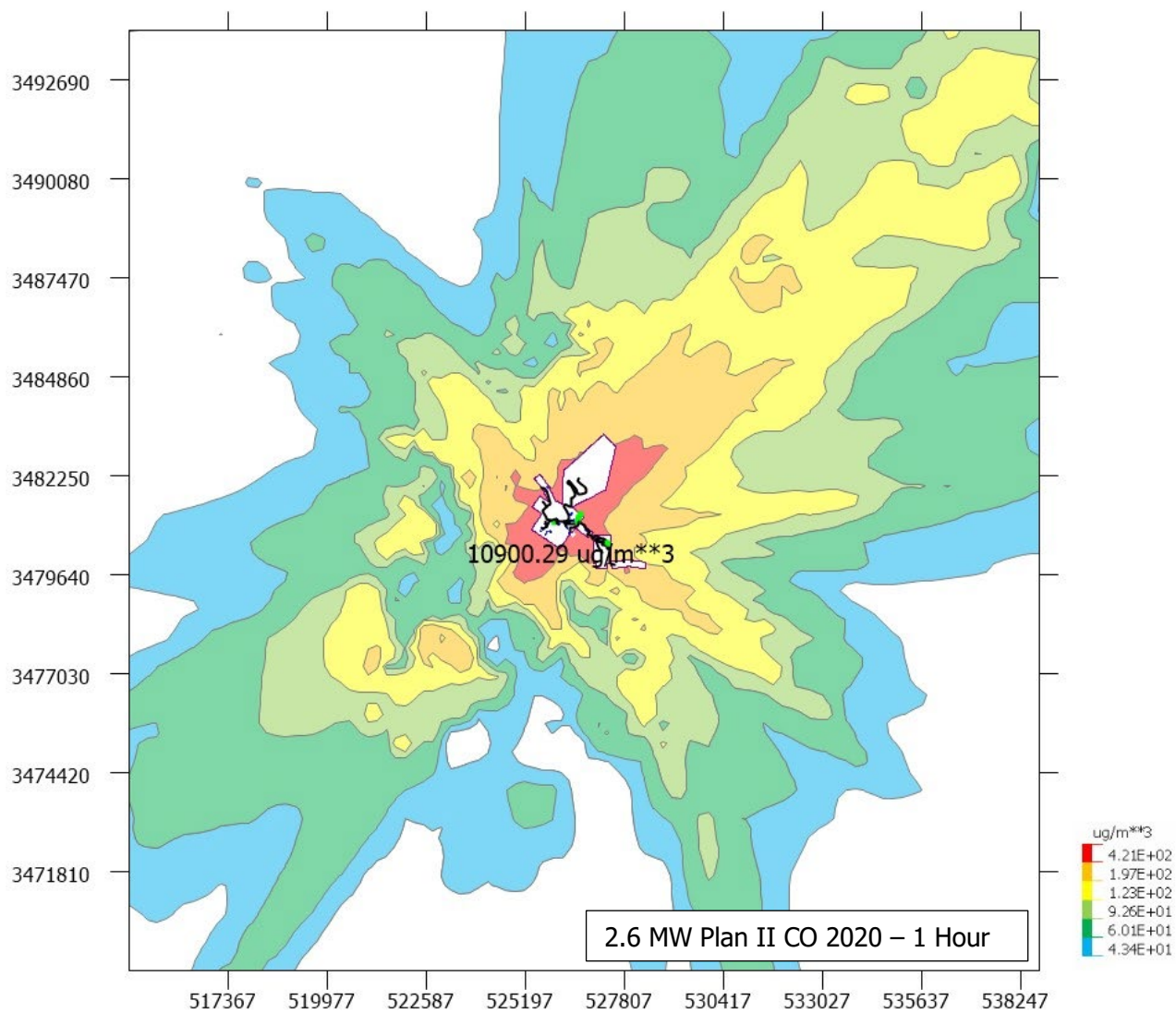
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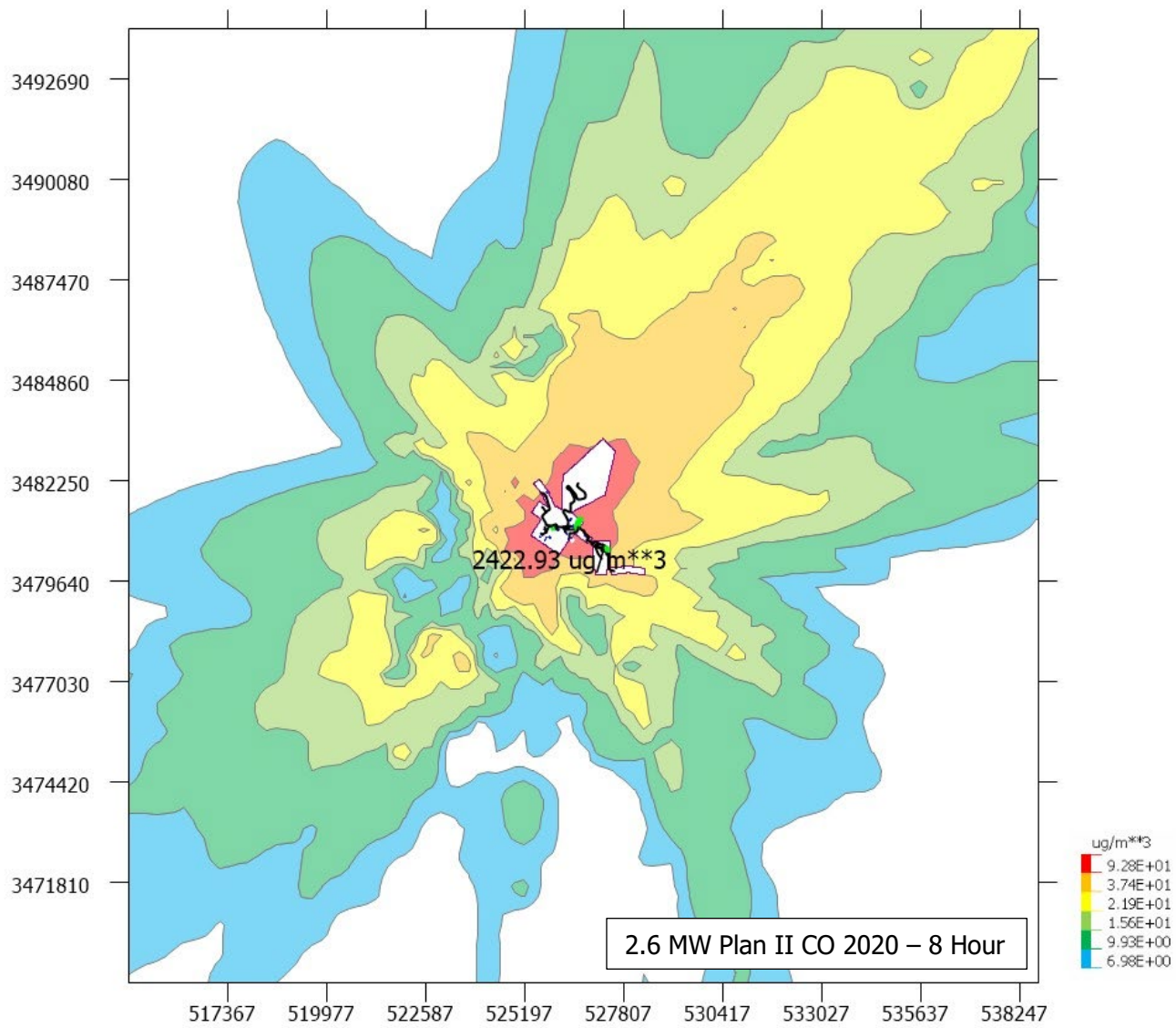
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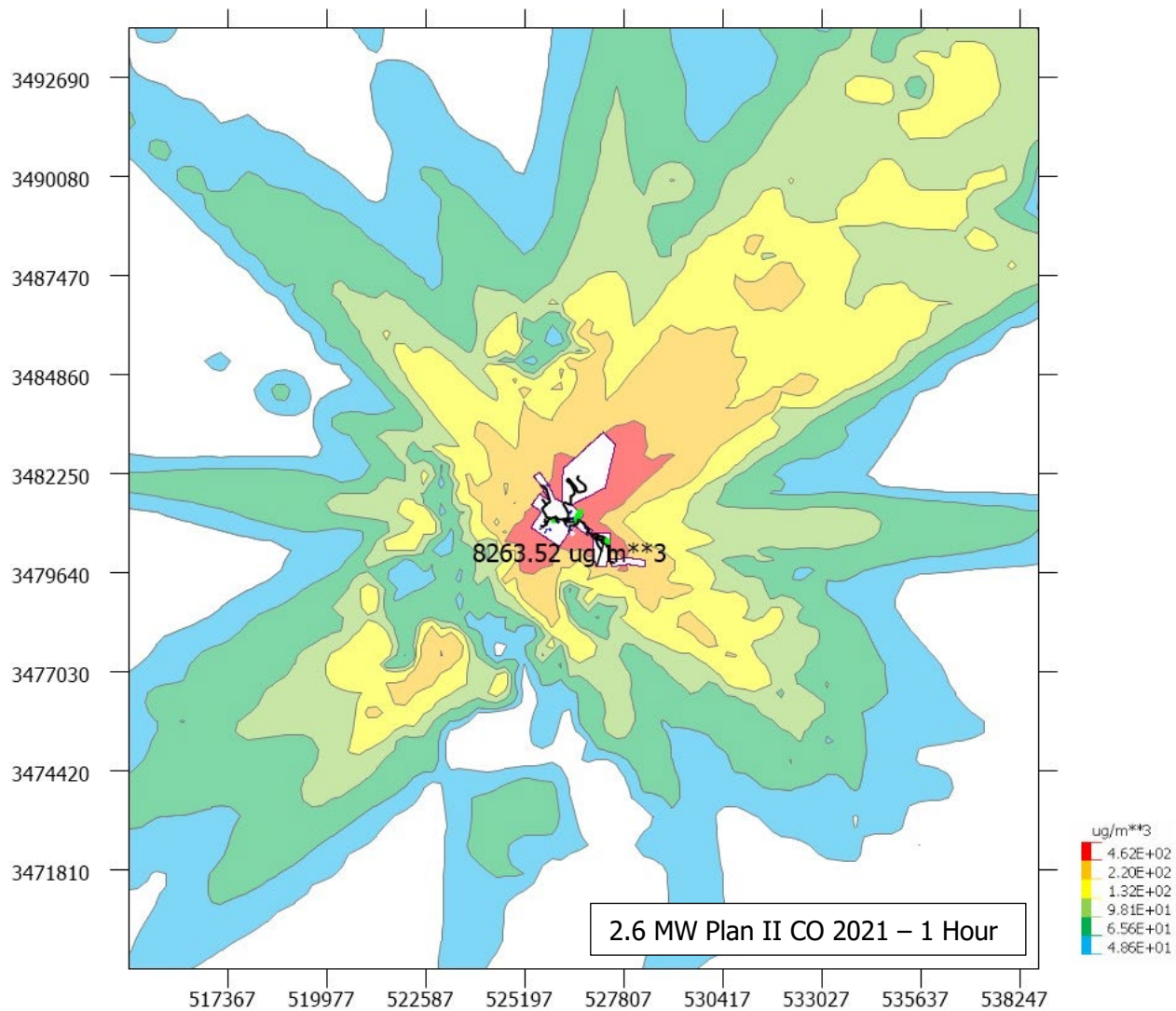


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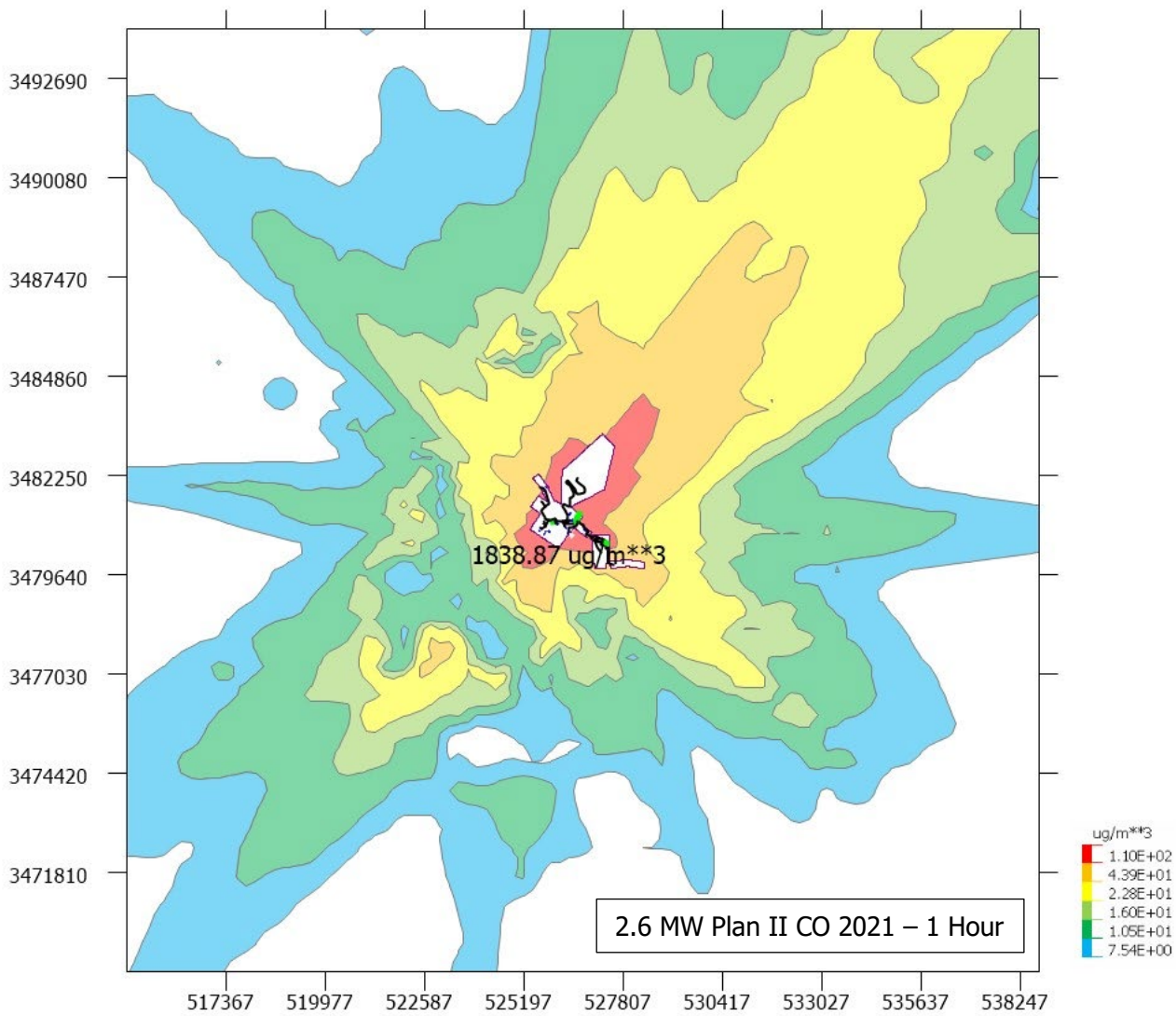




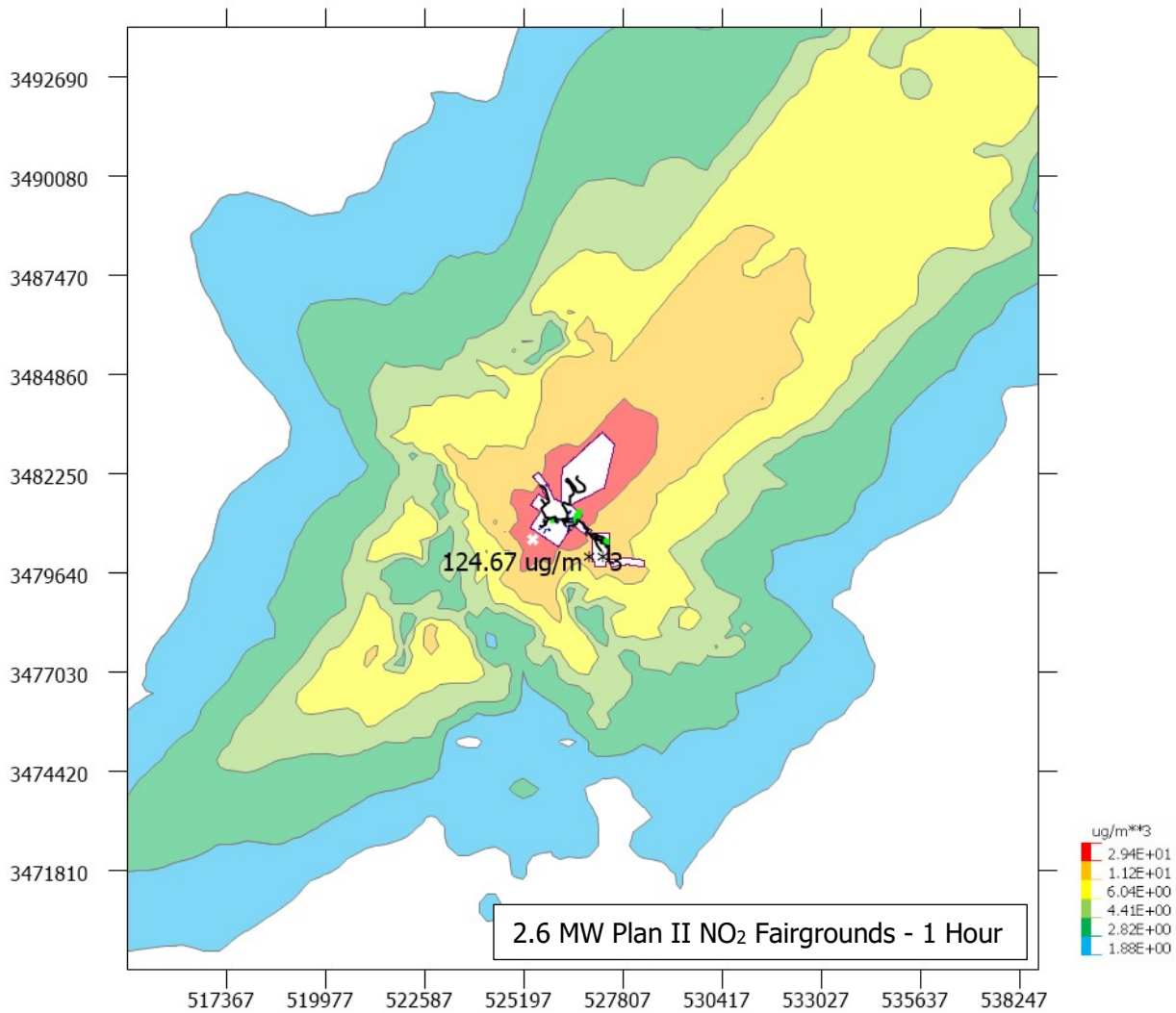
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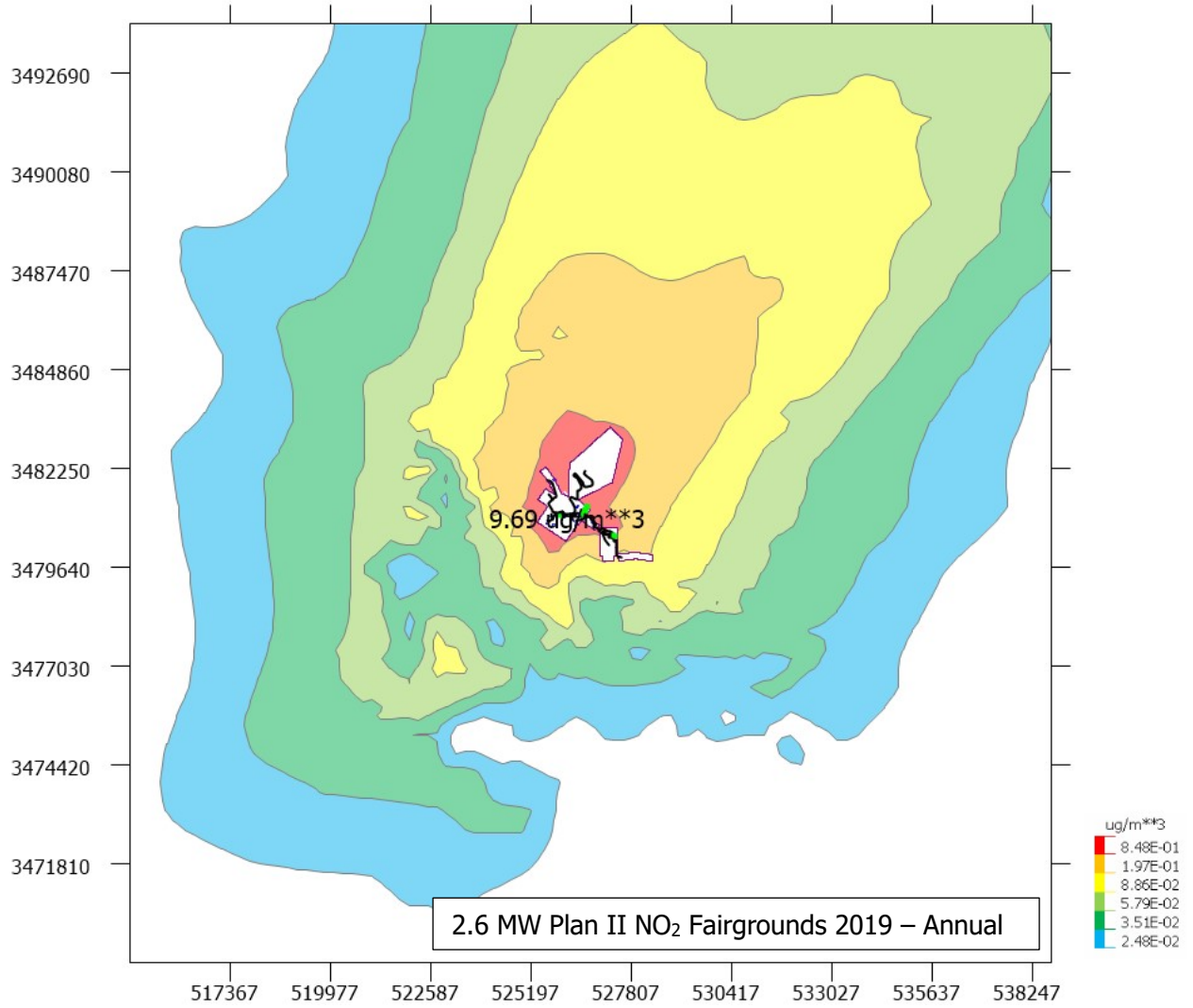
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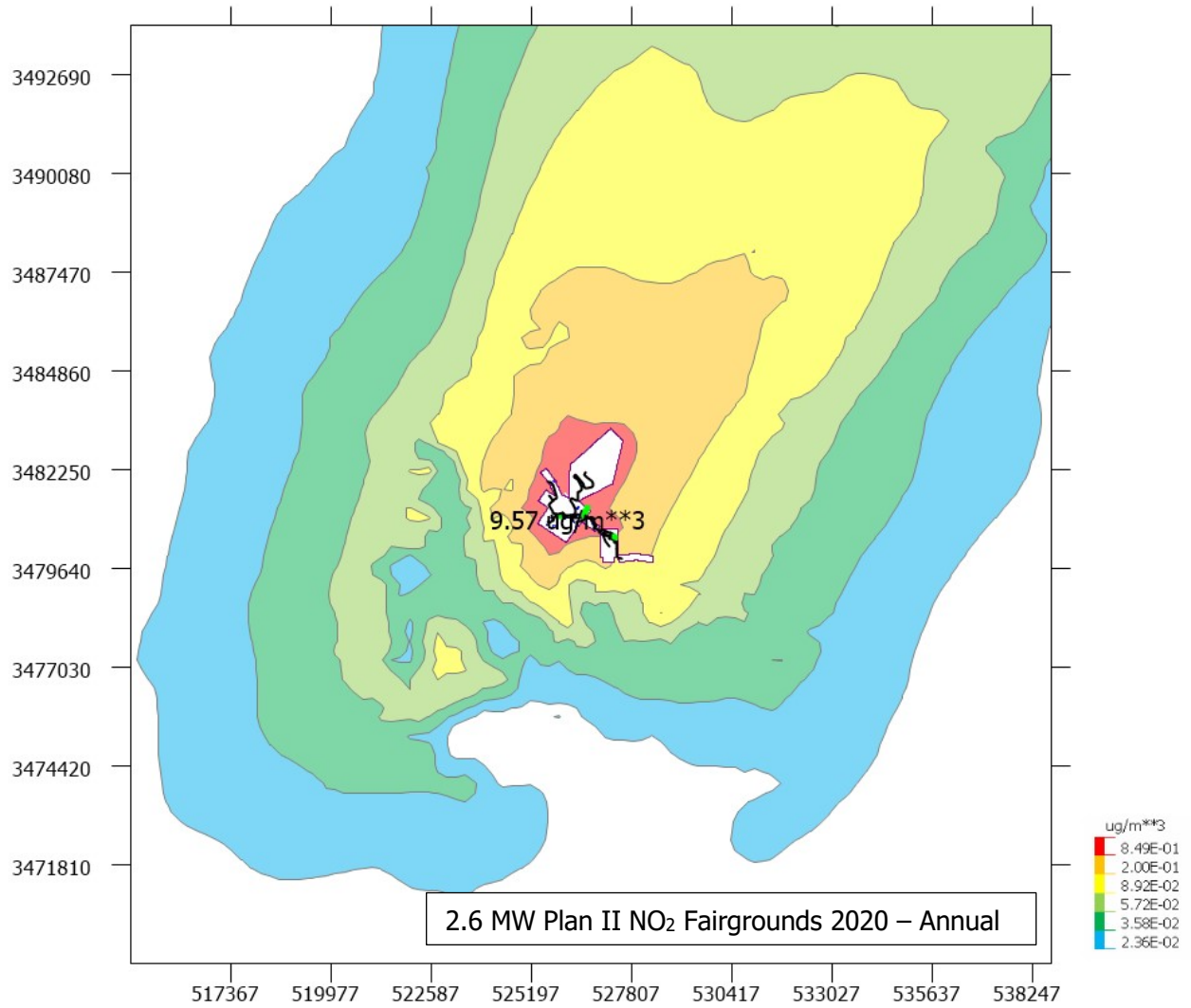
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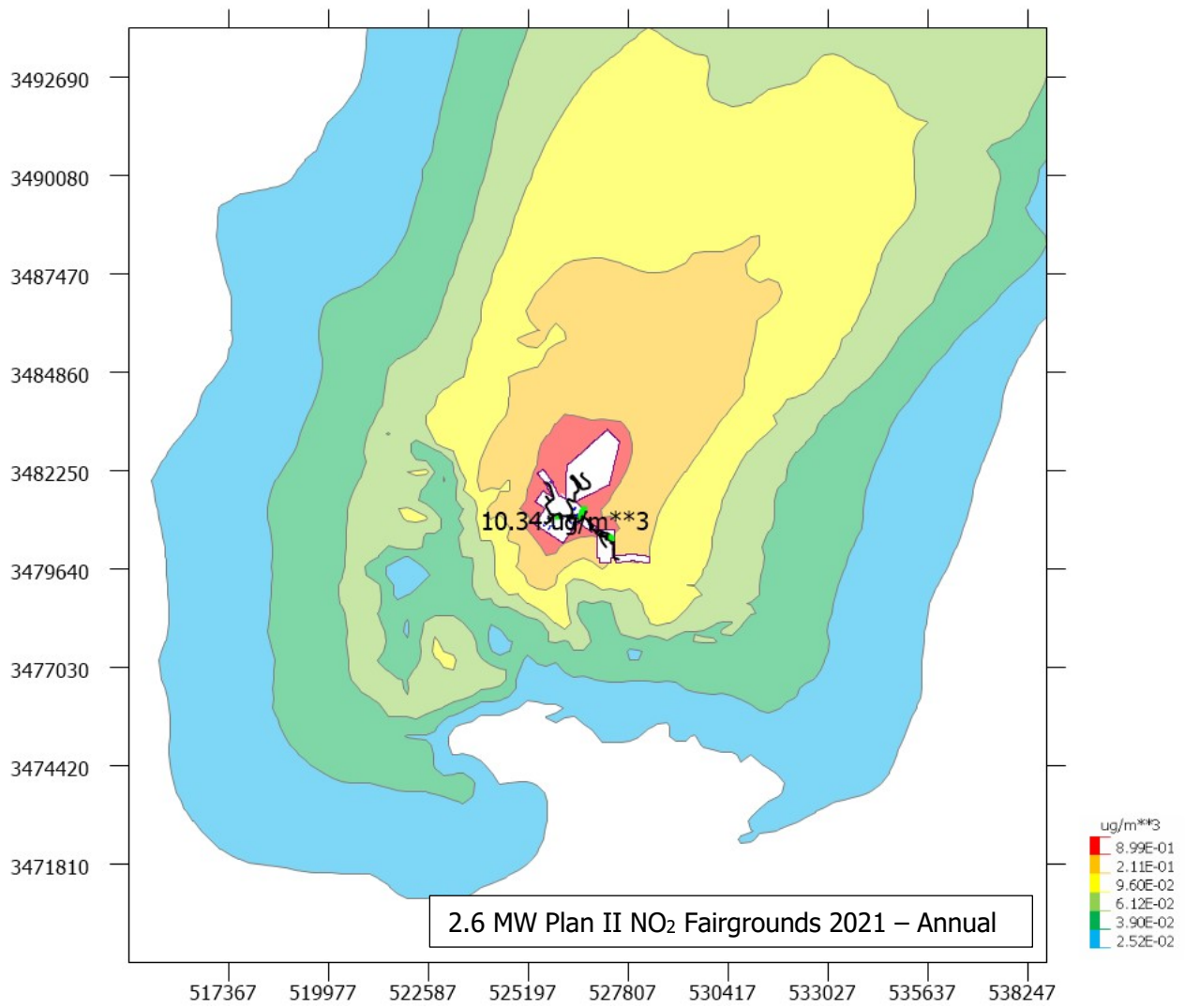
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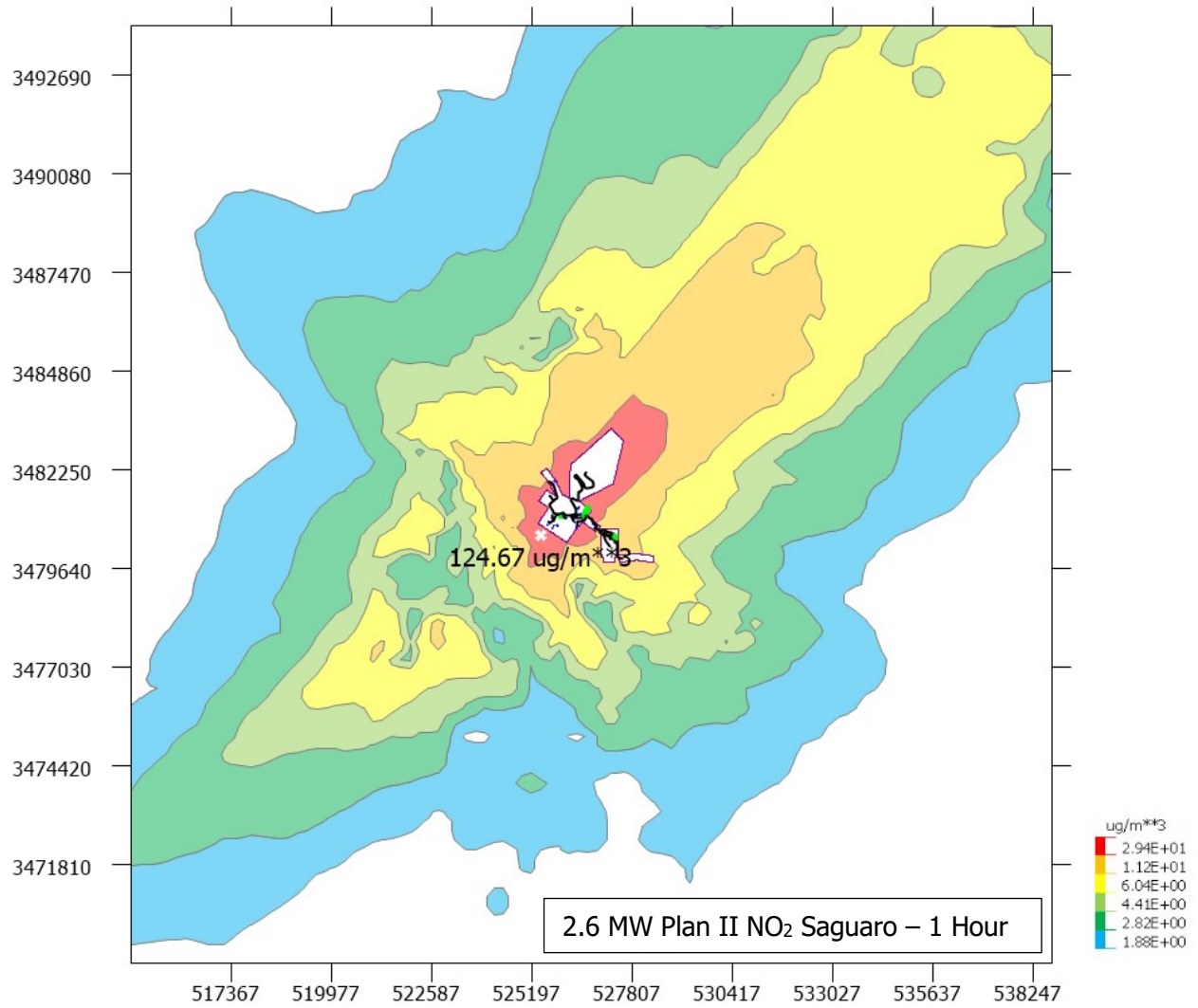
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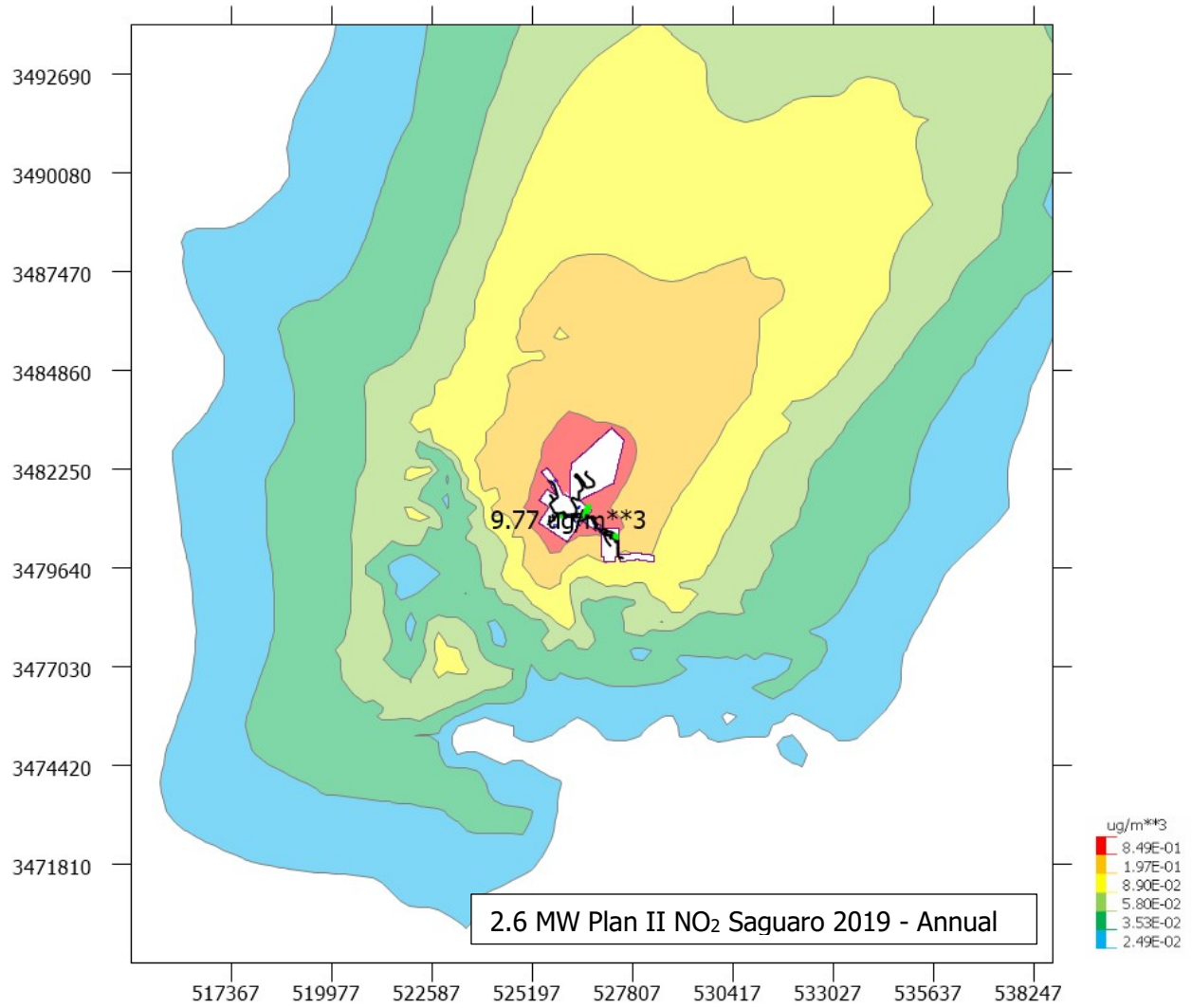
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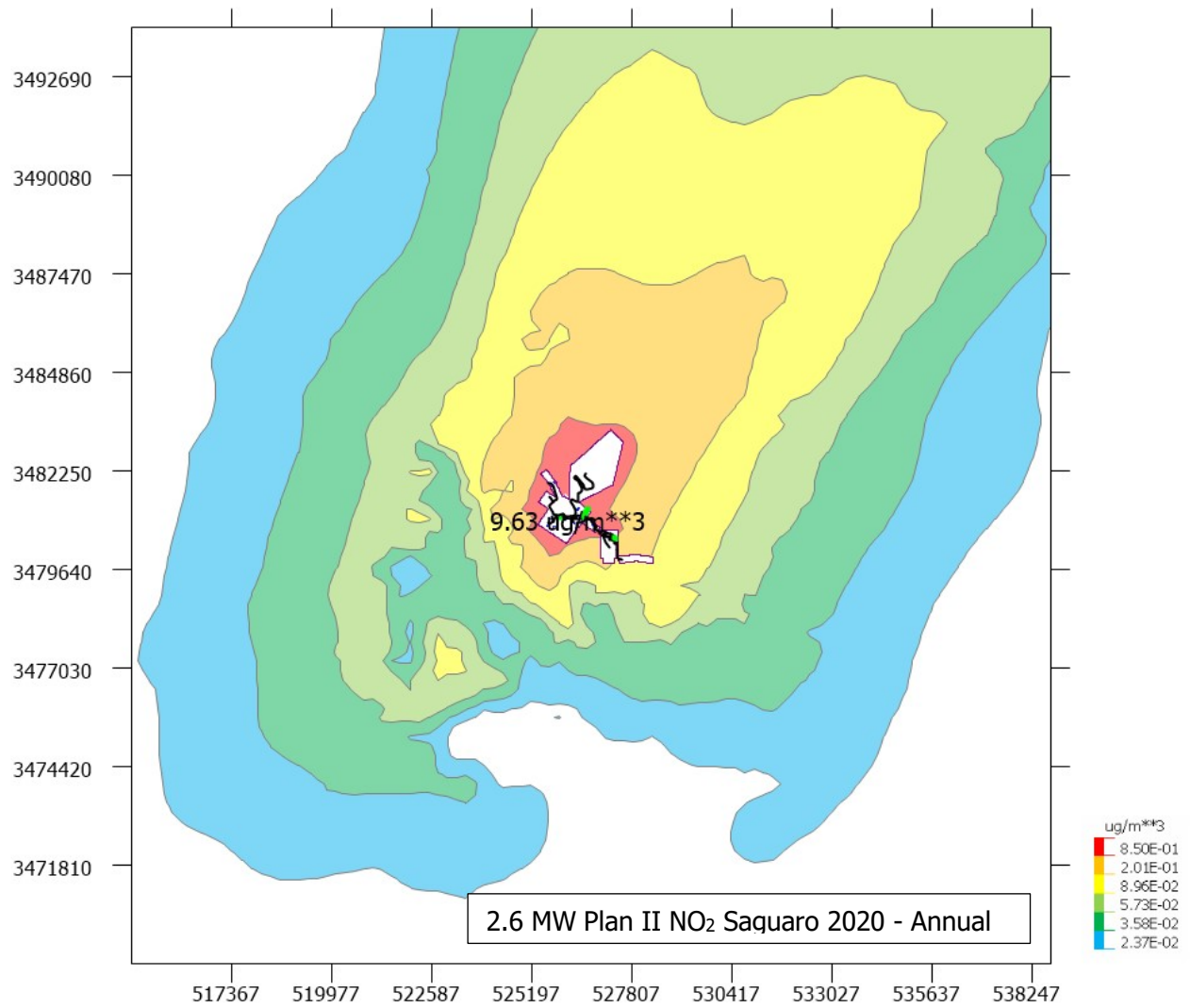


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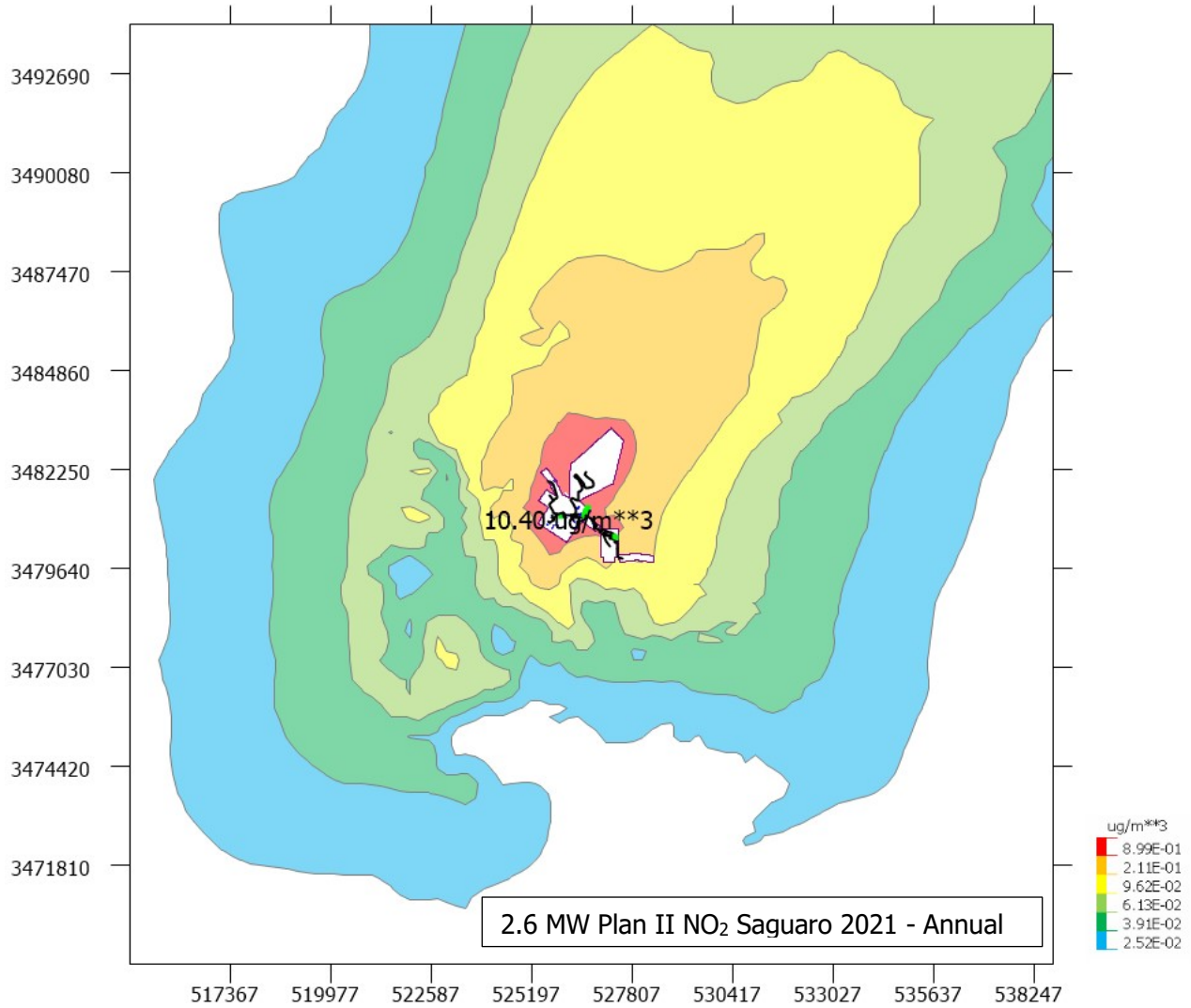




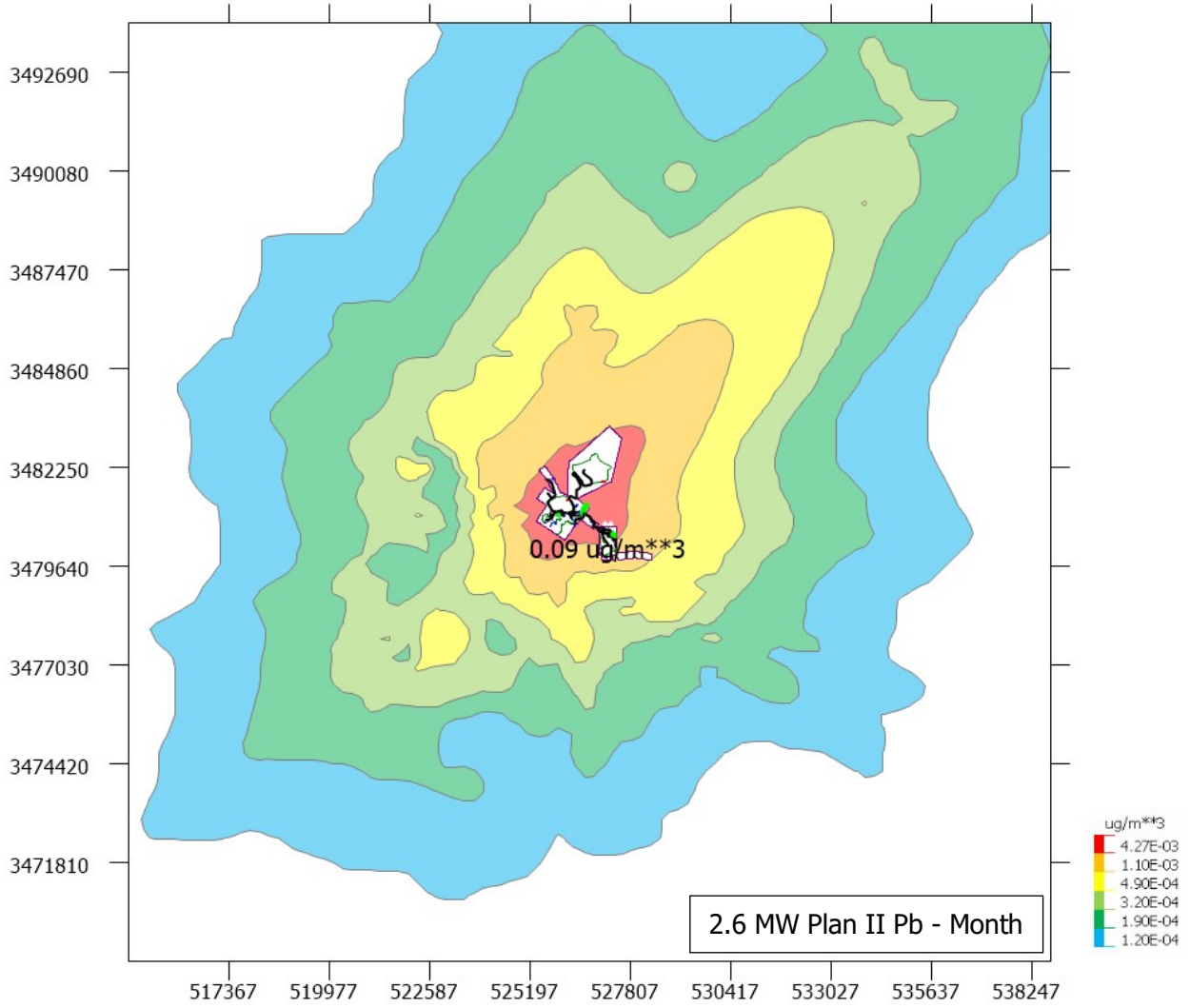
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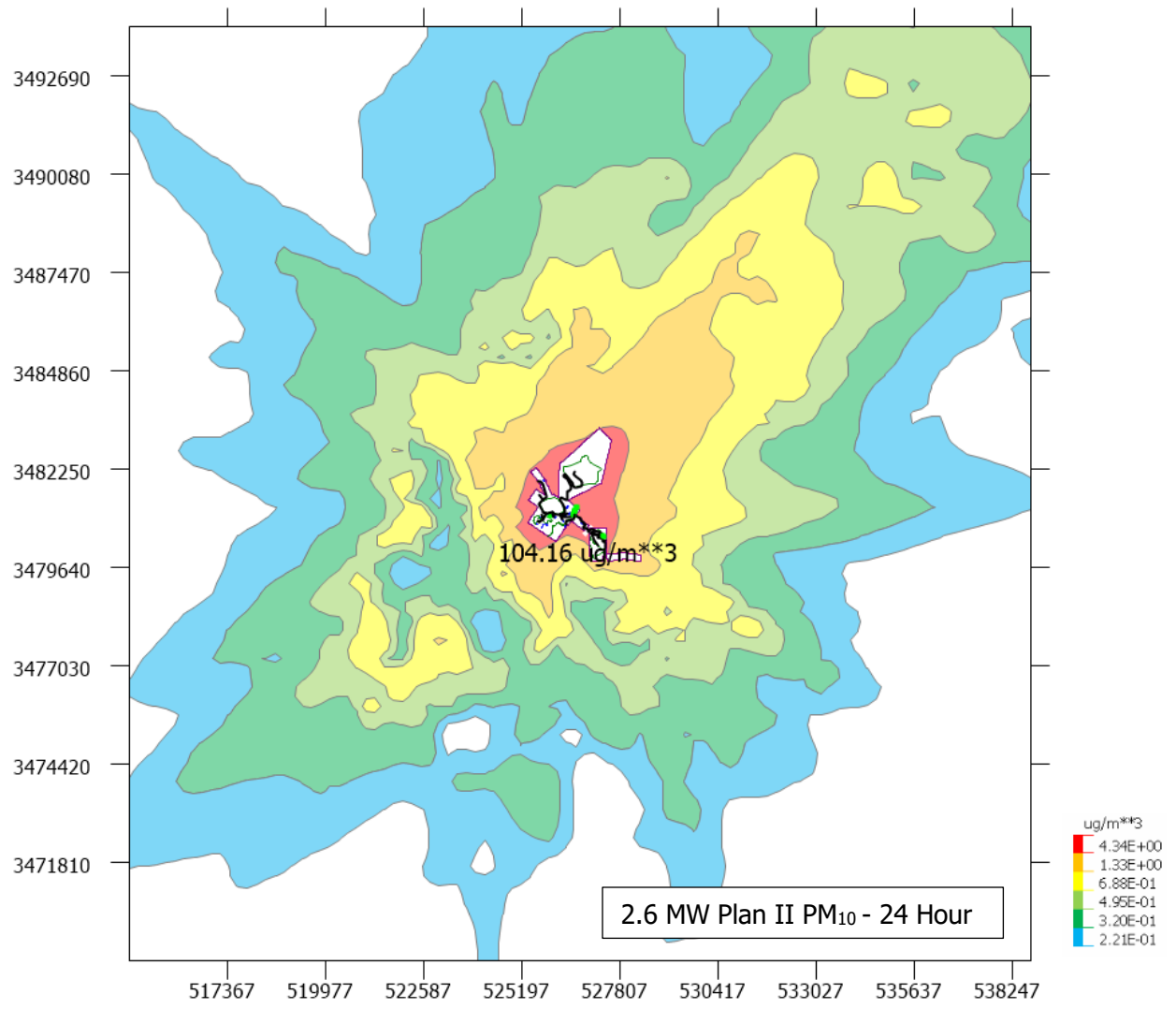
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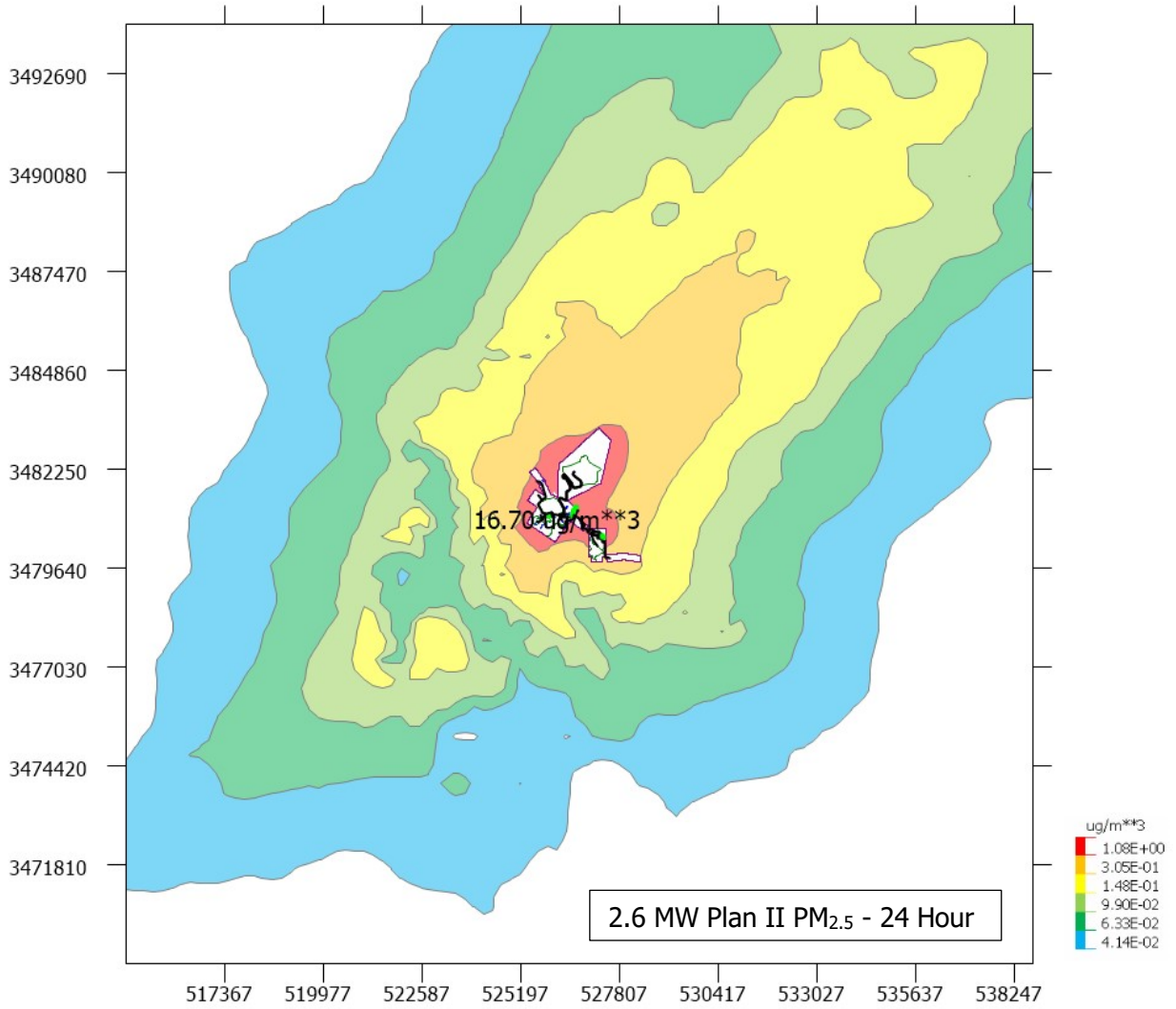
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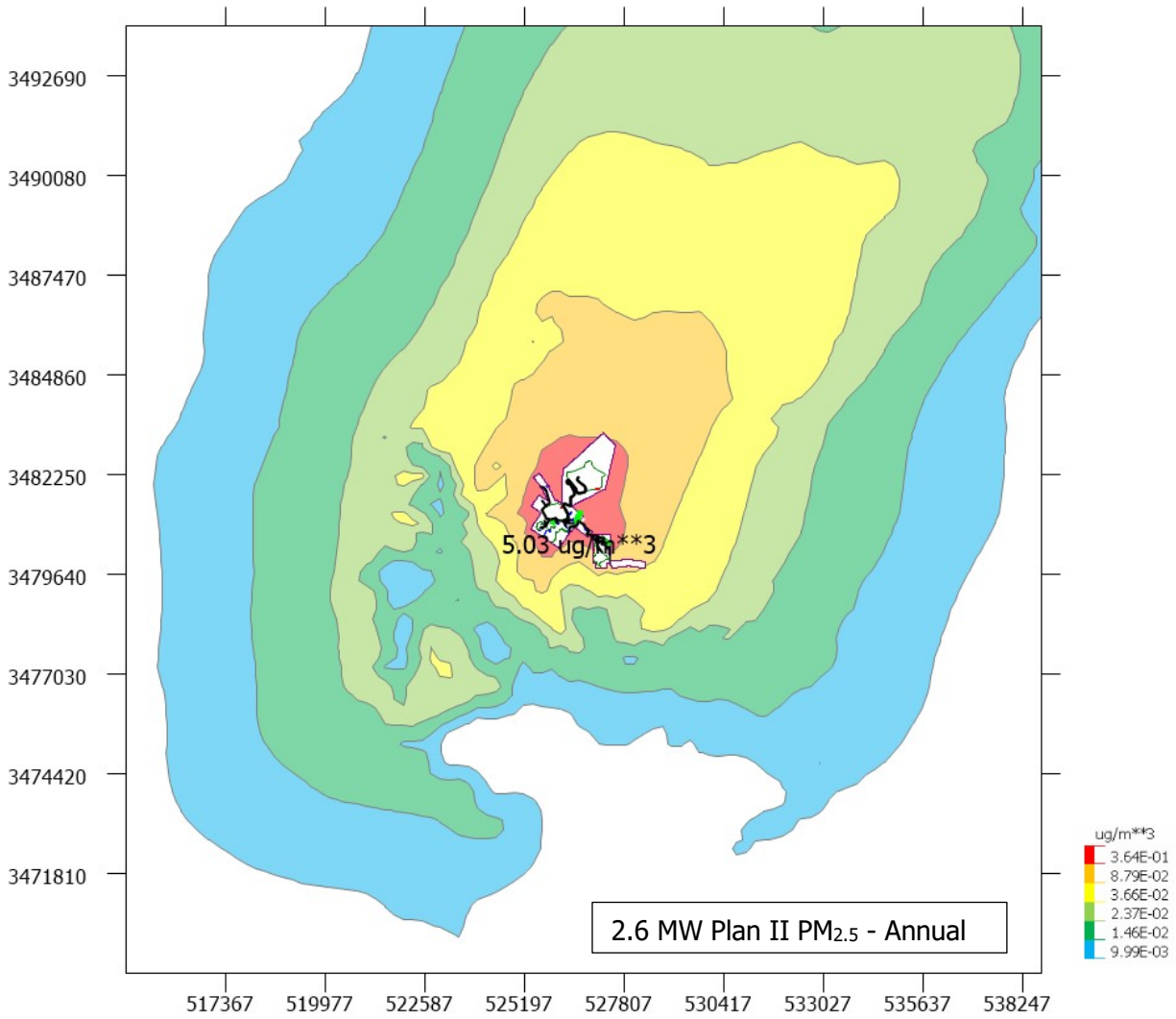
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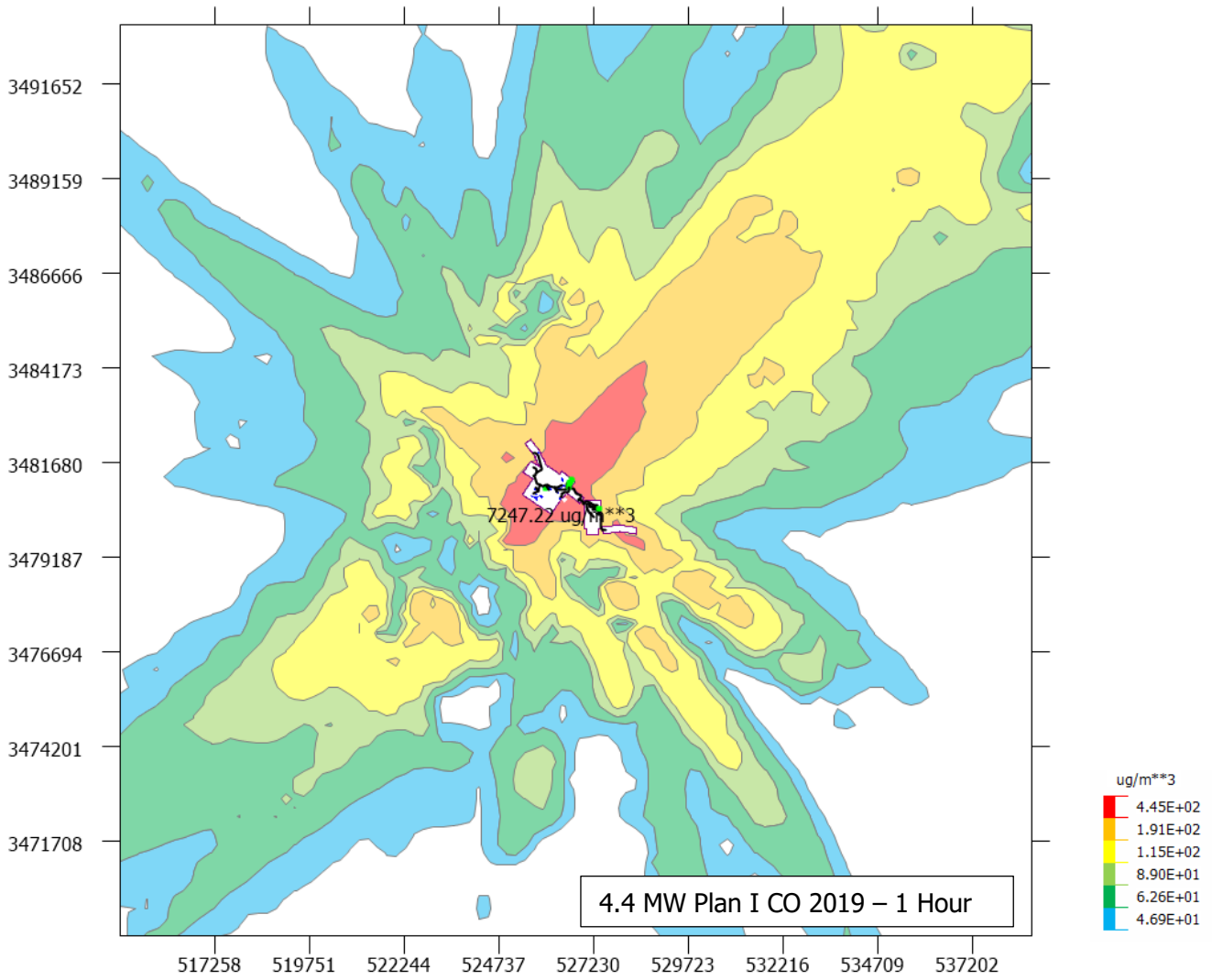
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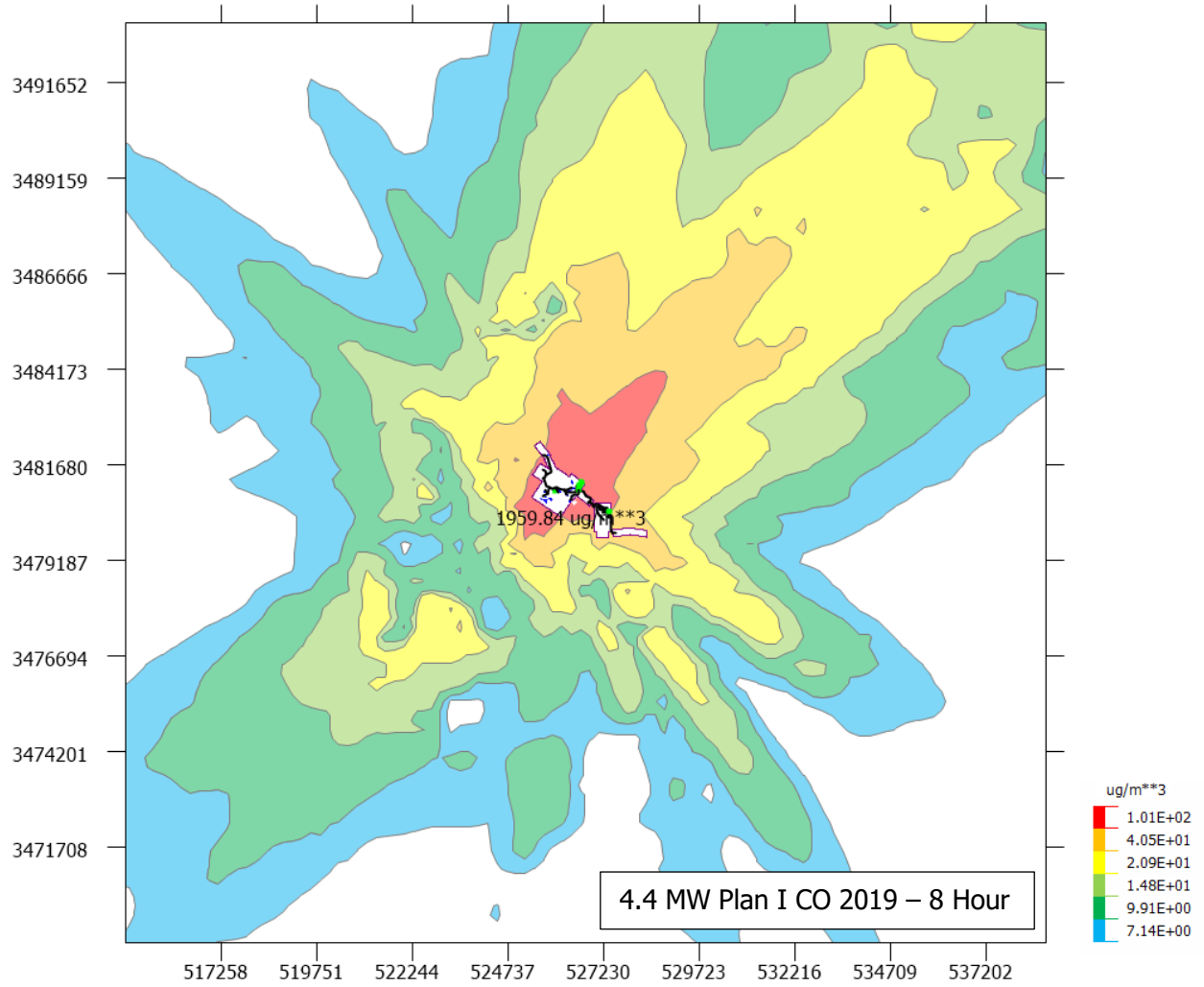
### 2.6 MW Plan II PM<sub>2.5</sub> – Annual



### 4.4 MW Plan I CO 2019 - 1 Hour

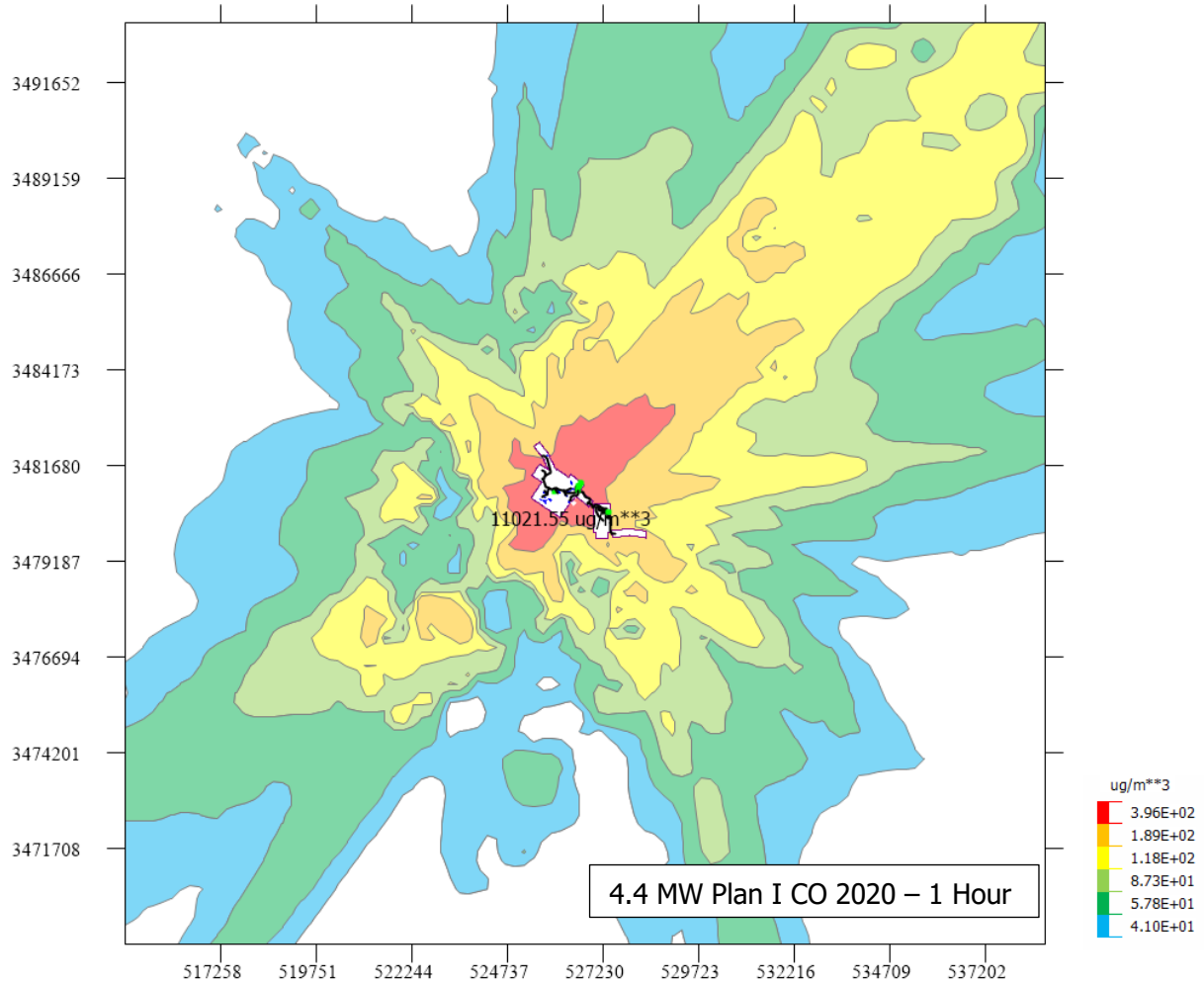


### 4.4 MW Plan I CO 2019 - 8 Hour

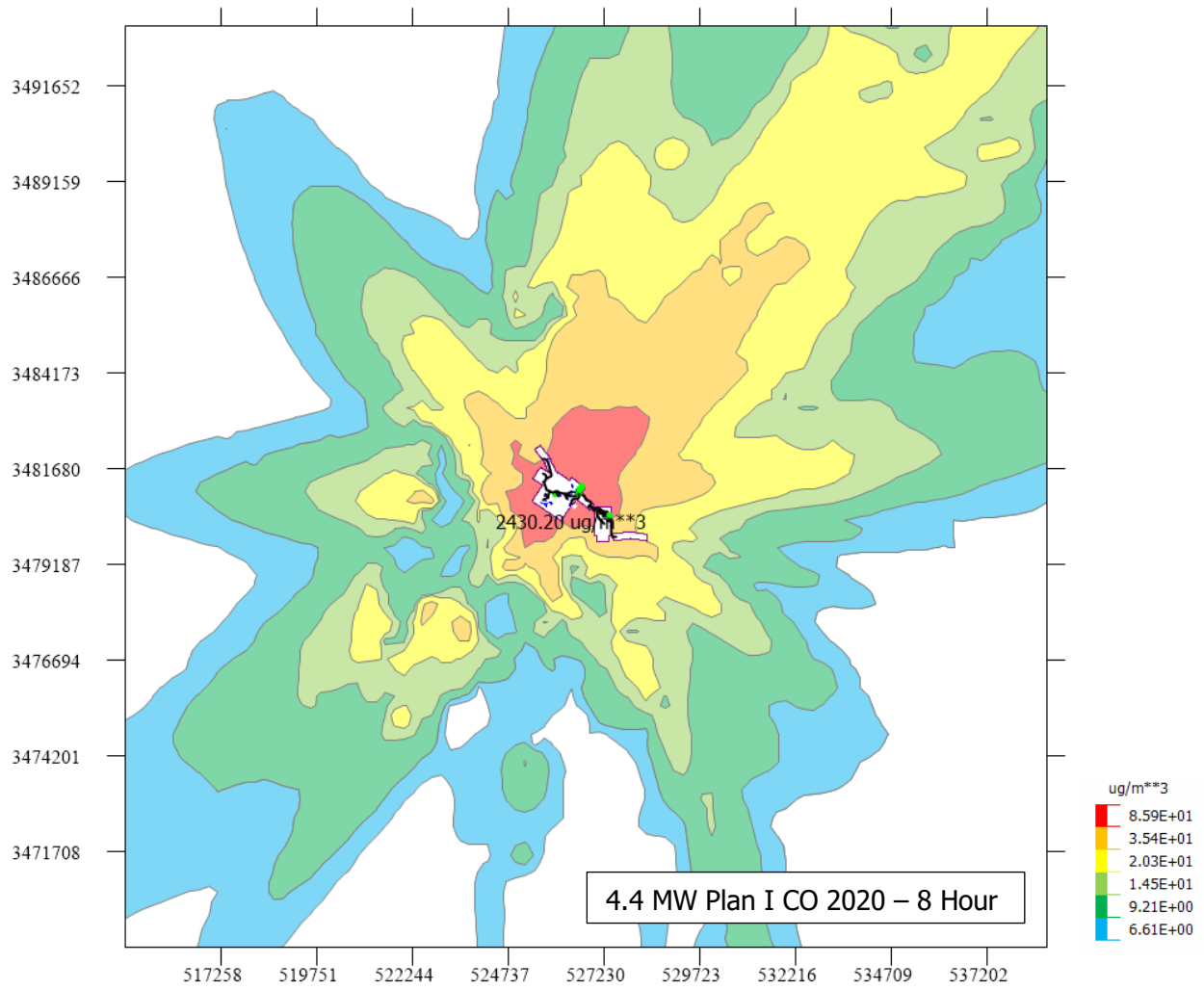




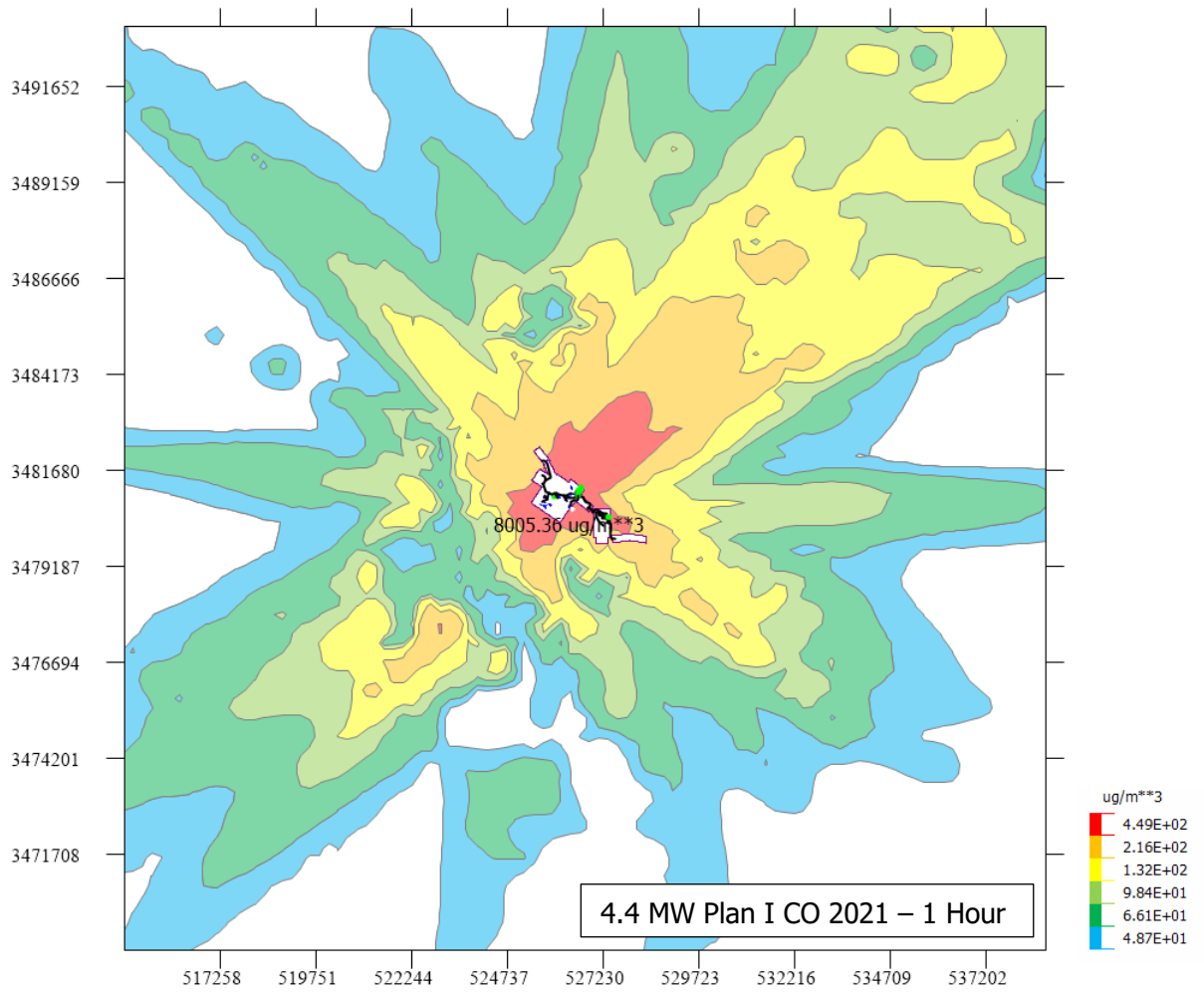
### 4.4 MW Plan I CO 2020 - 1 Hour



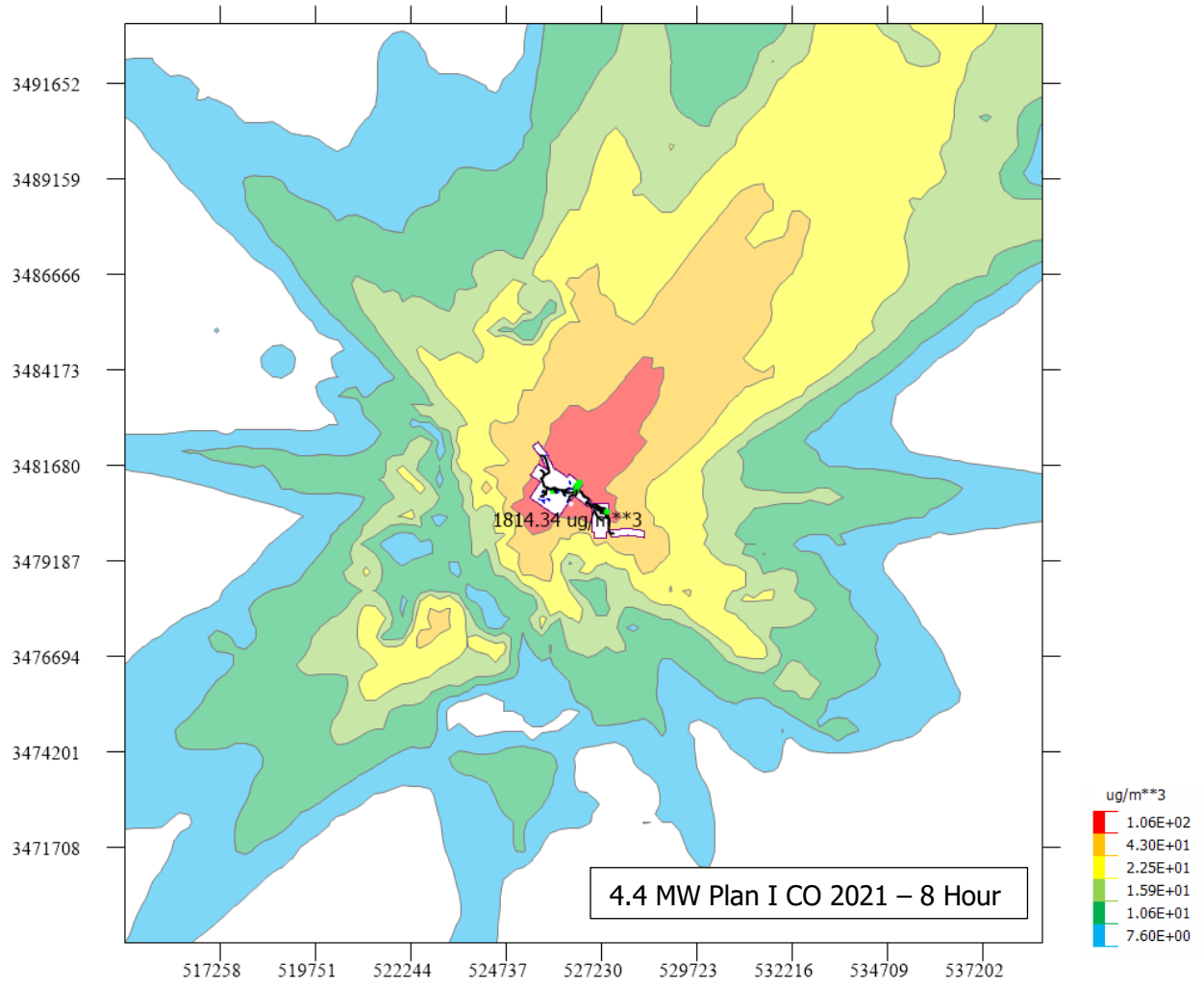
### 4.4 MW Plan I CO 2020 - 8 Hour



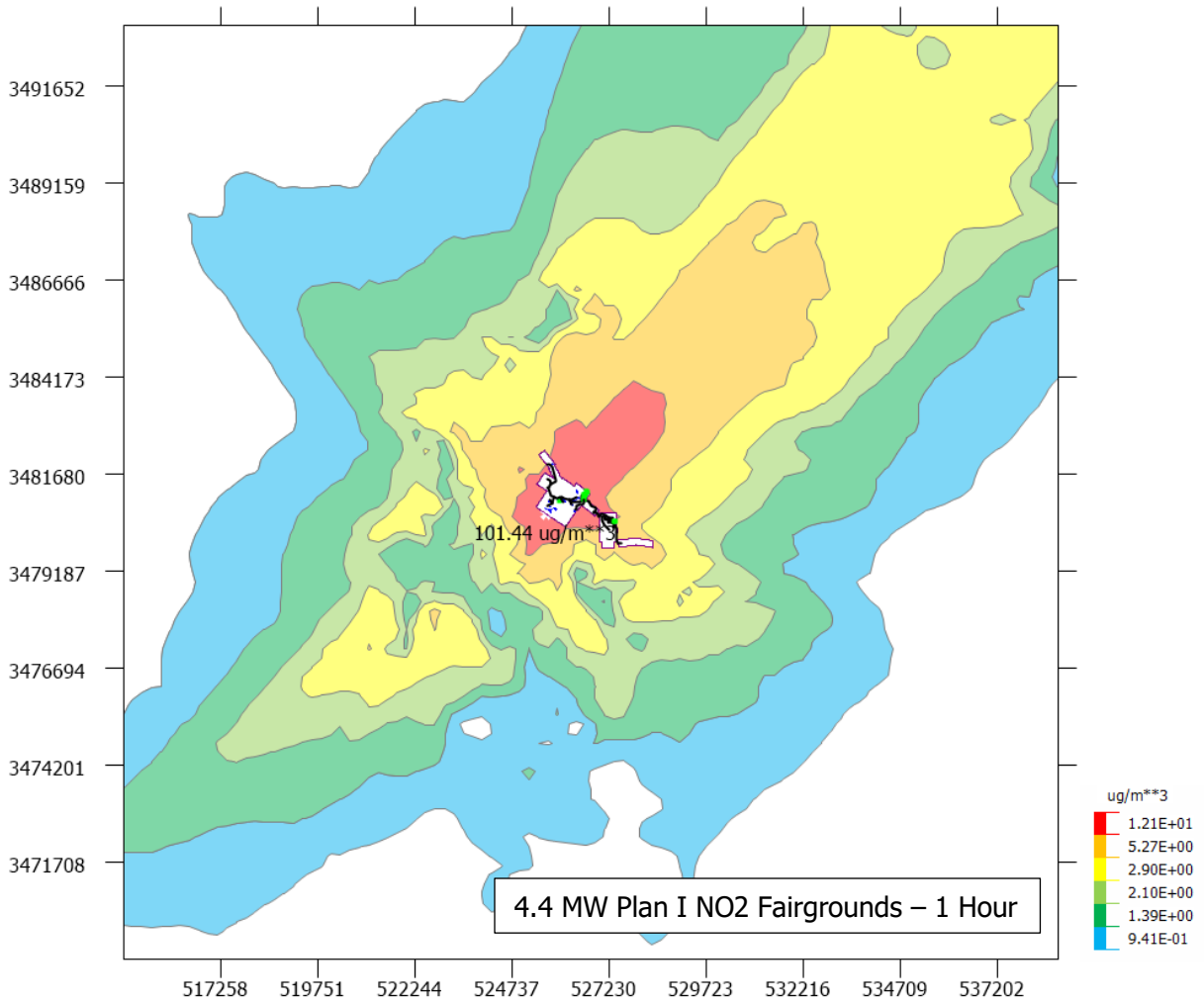
### 4.4 MW Plan I CO 2021 - 1 Hour



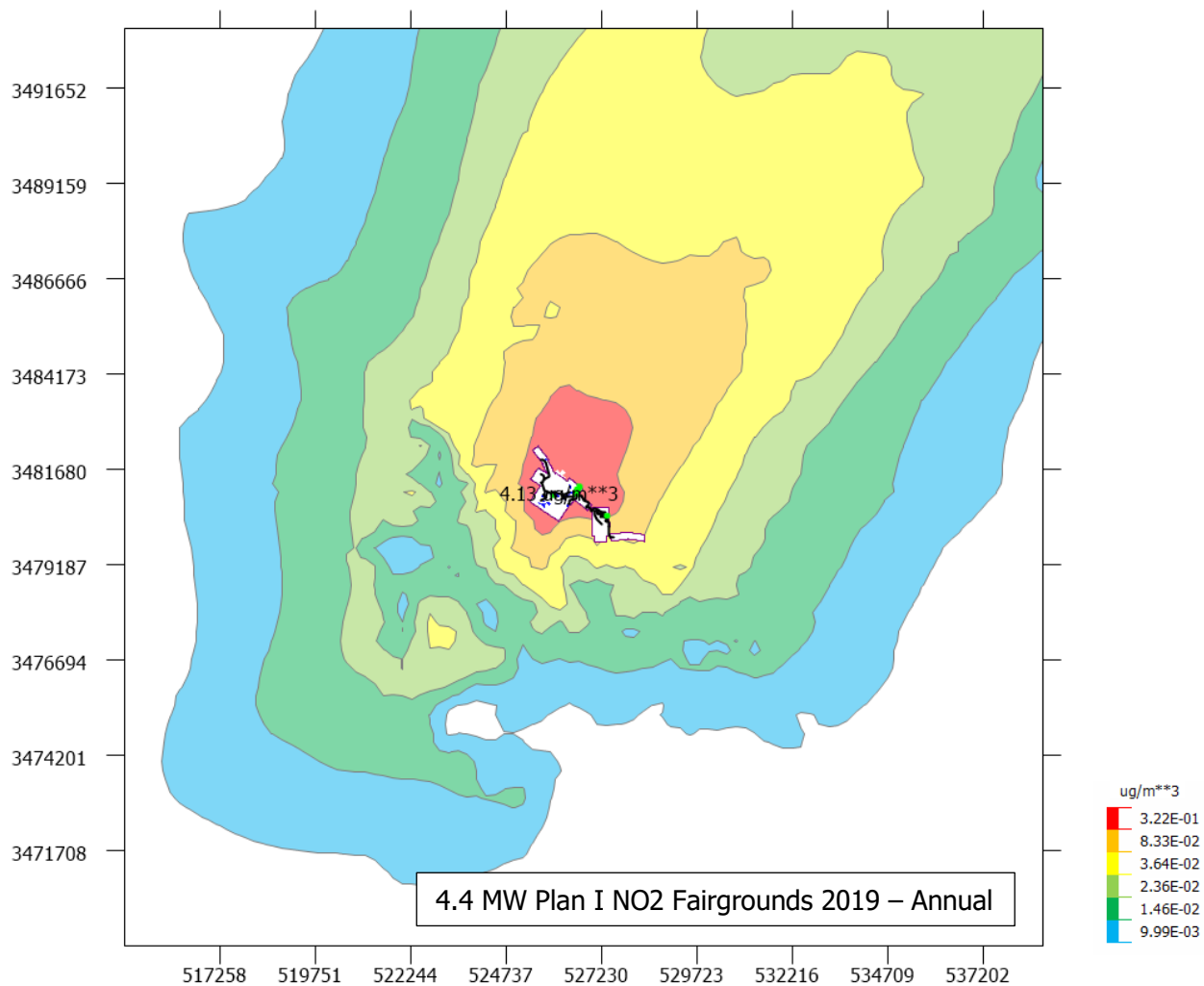
### 4.4 MW Plan I CO 2021 - 8 Hour



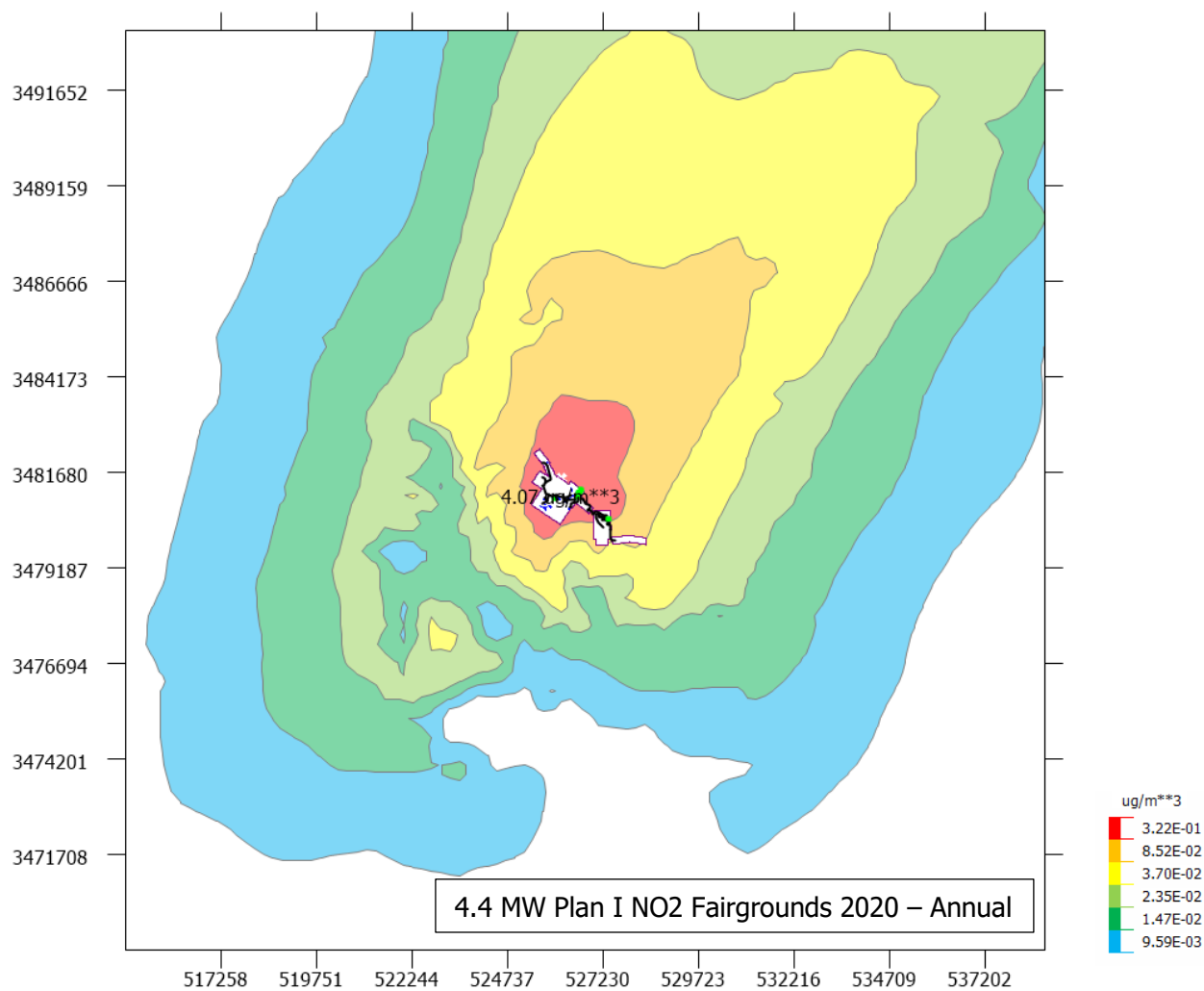
### 4.4 MW Plan I NO<sub>2</sub> Fairgrounds - 1 Hour



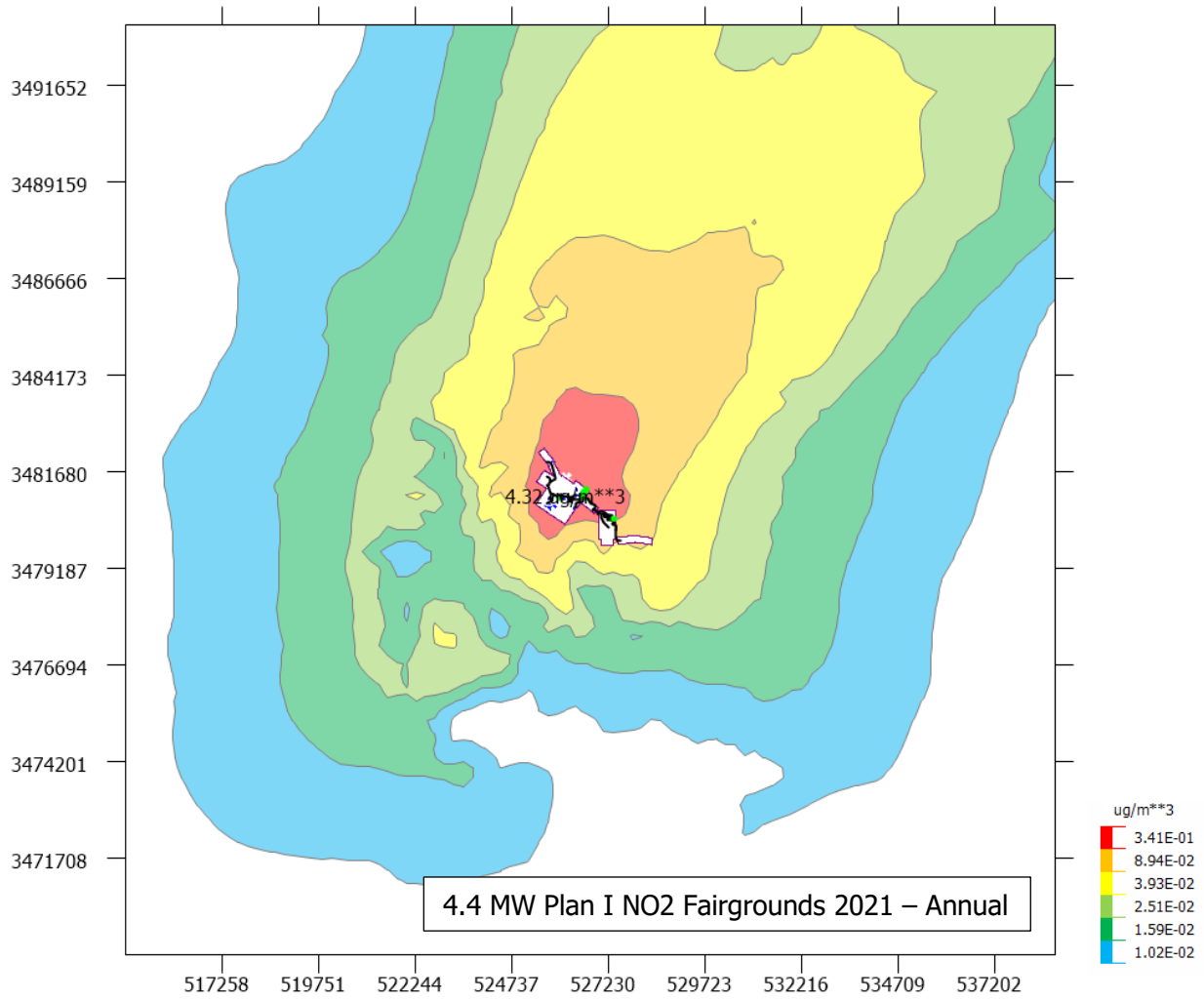
### 4.4 MW Plan I NO<sub>2</sub> Fairgrounds 2019 – Annual



### 4.4 MW Plan I NO<sub>2</sub> Fairgrounds 2020 – Annual

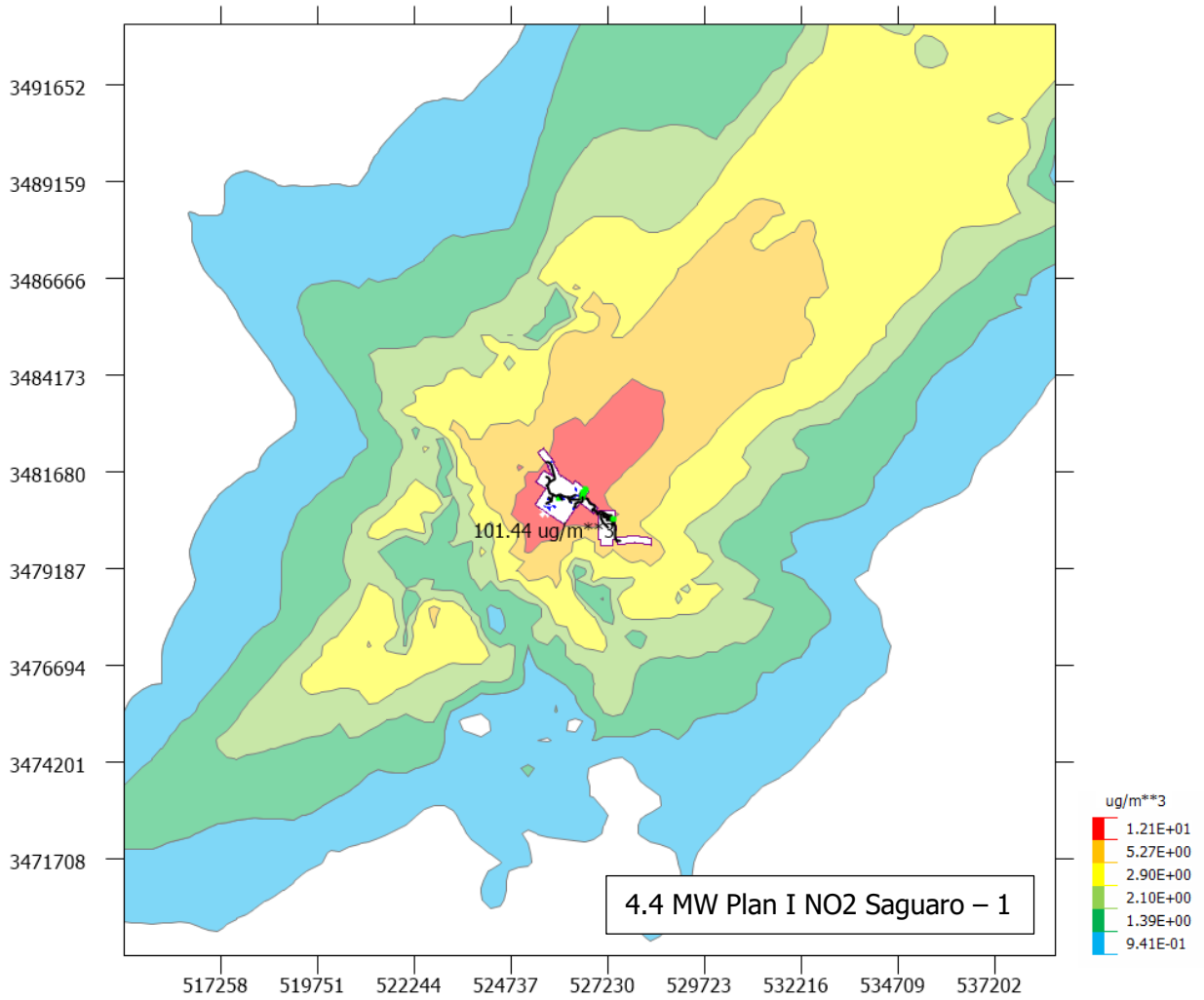


### 4.4 MW Plan I NO<sub>2</sub> Fairgrounds 2021 – Annual

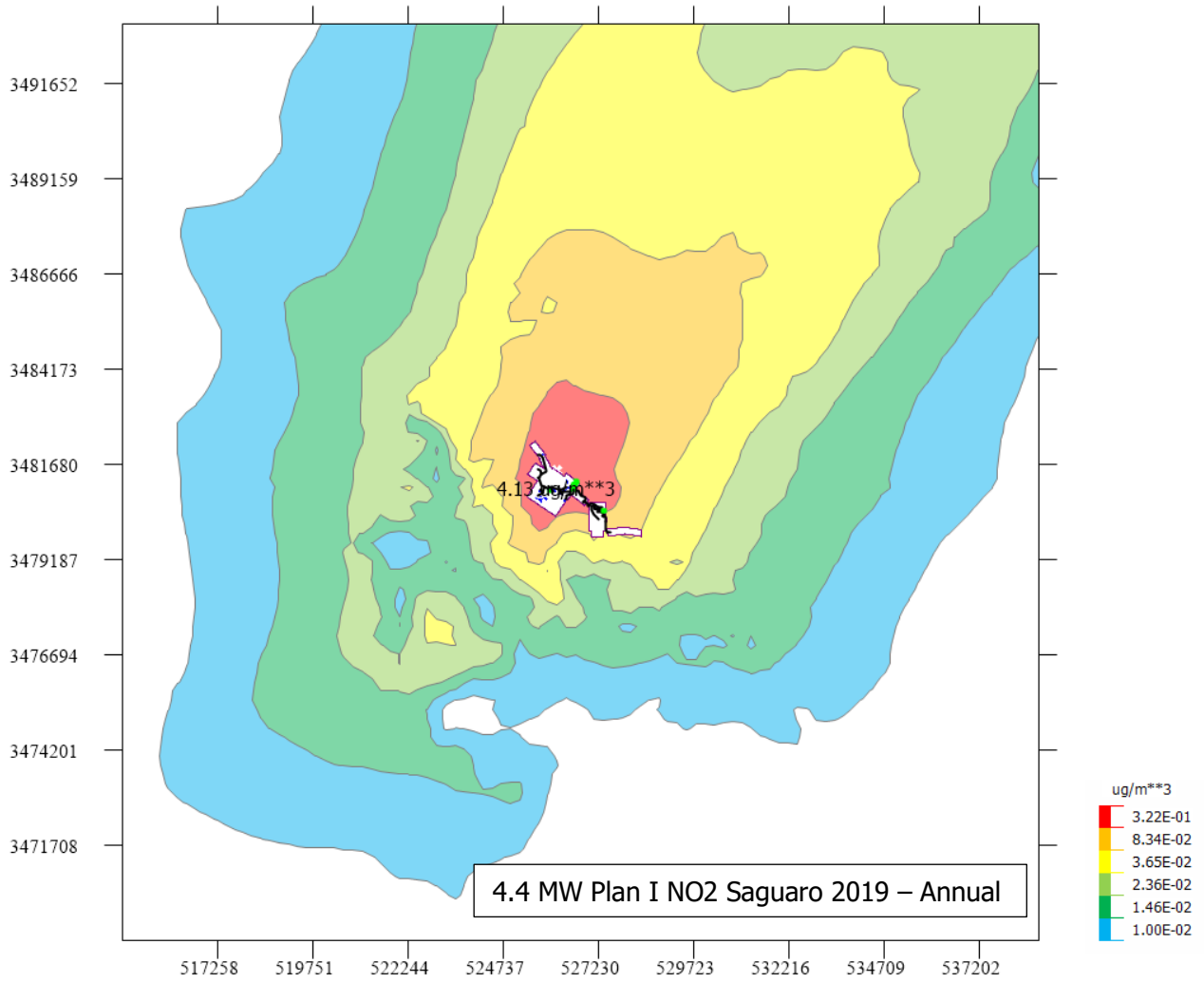




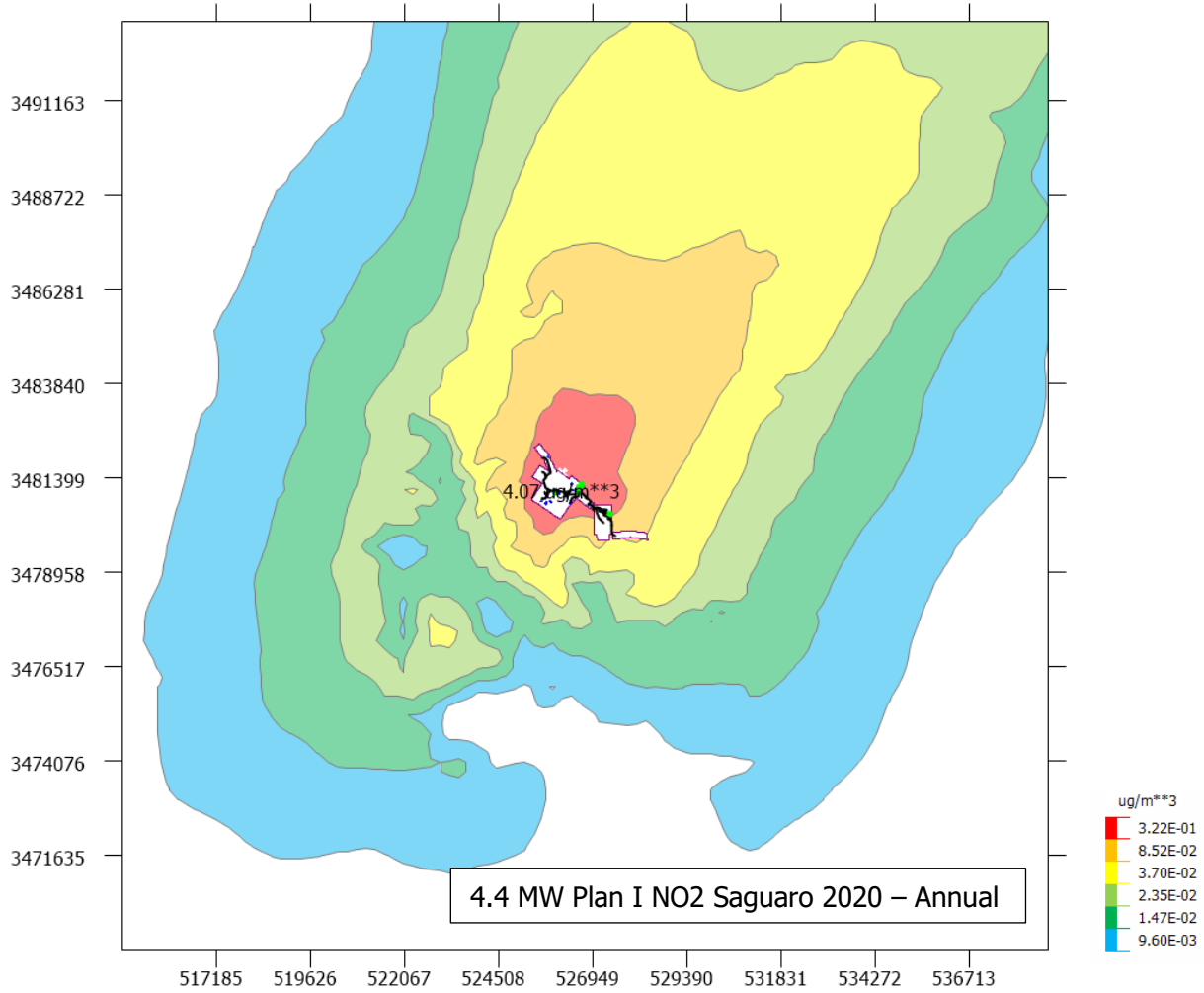
### 4.4 MW Plan I NO<sub>2</sub> Saguaro - 1 Hour



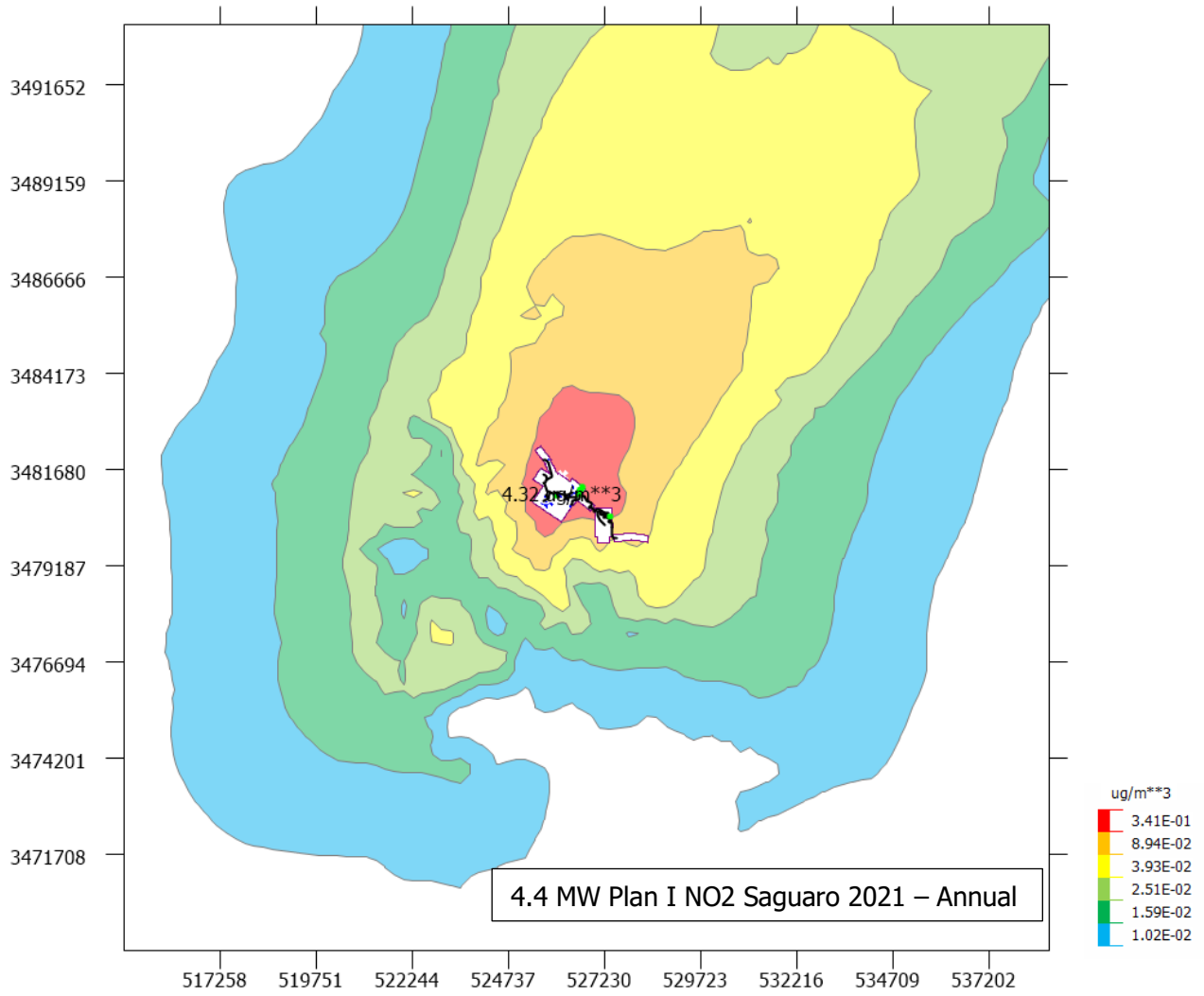
### 4.4 MW Plan I NO<sub>2</sub> Saguaro 2019 – Annual



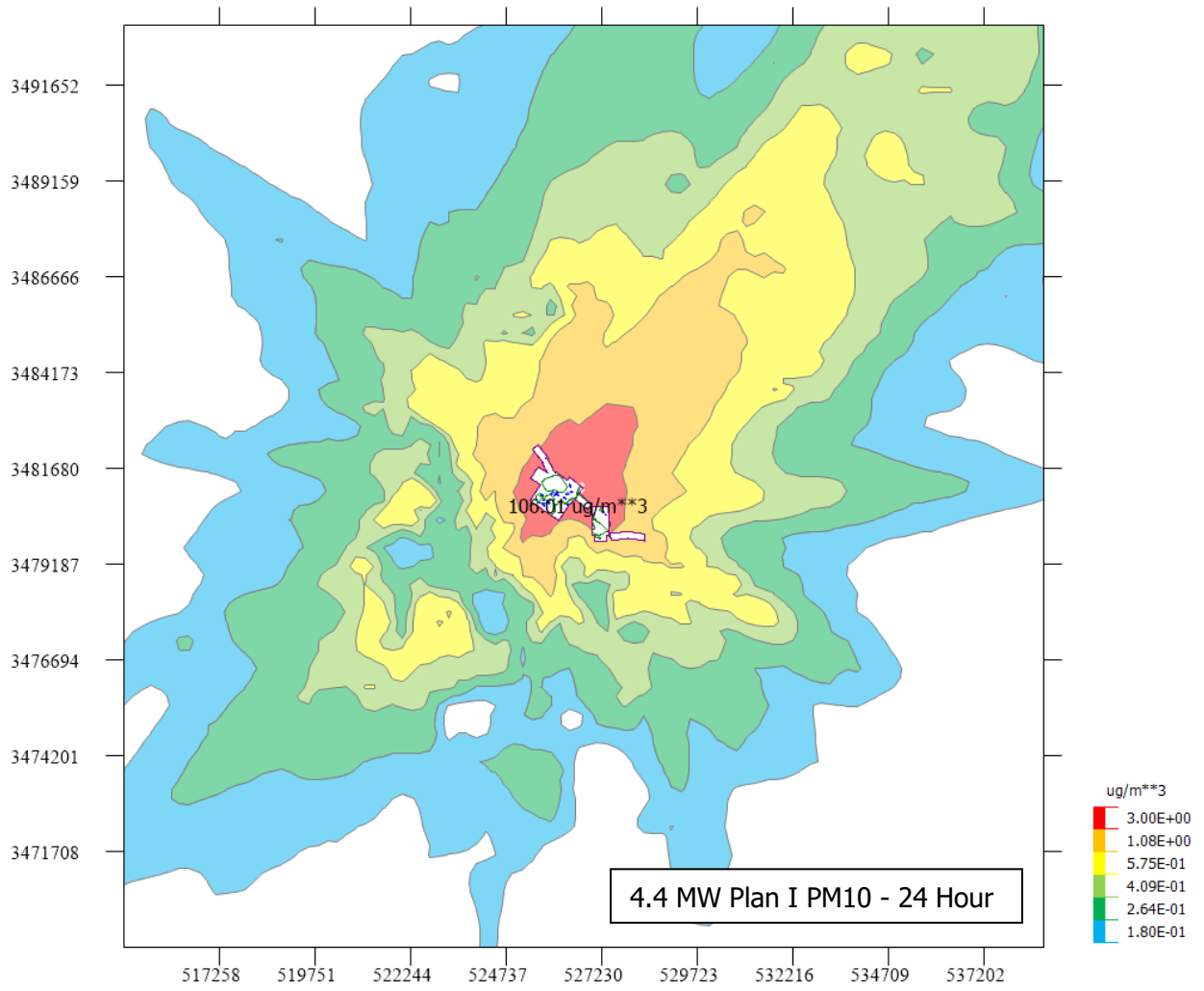
### 4.4 MW Plan I NO<sub>2</sub> Saguaro 2020 – Annual



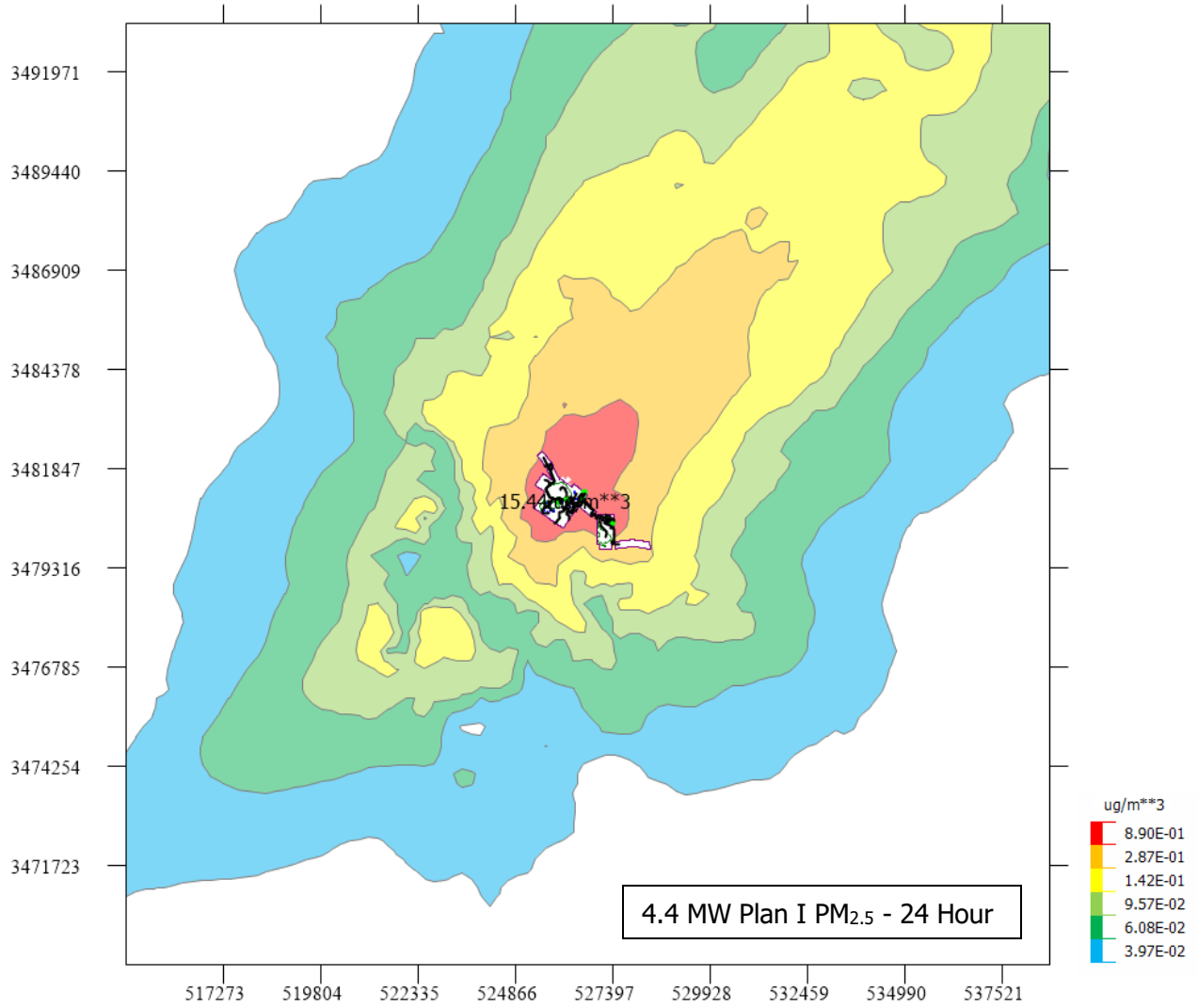
### 4.4 MW Plan I NO<sub>2</sub> Saguaro 2021 – Annual



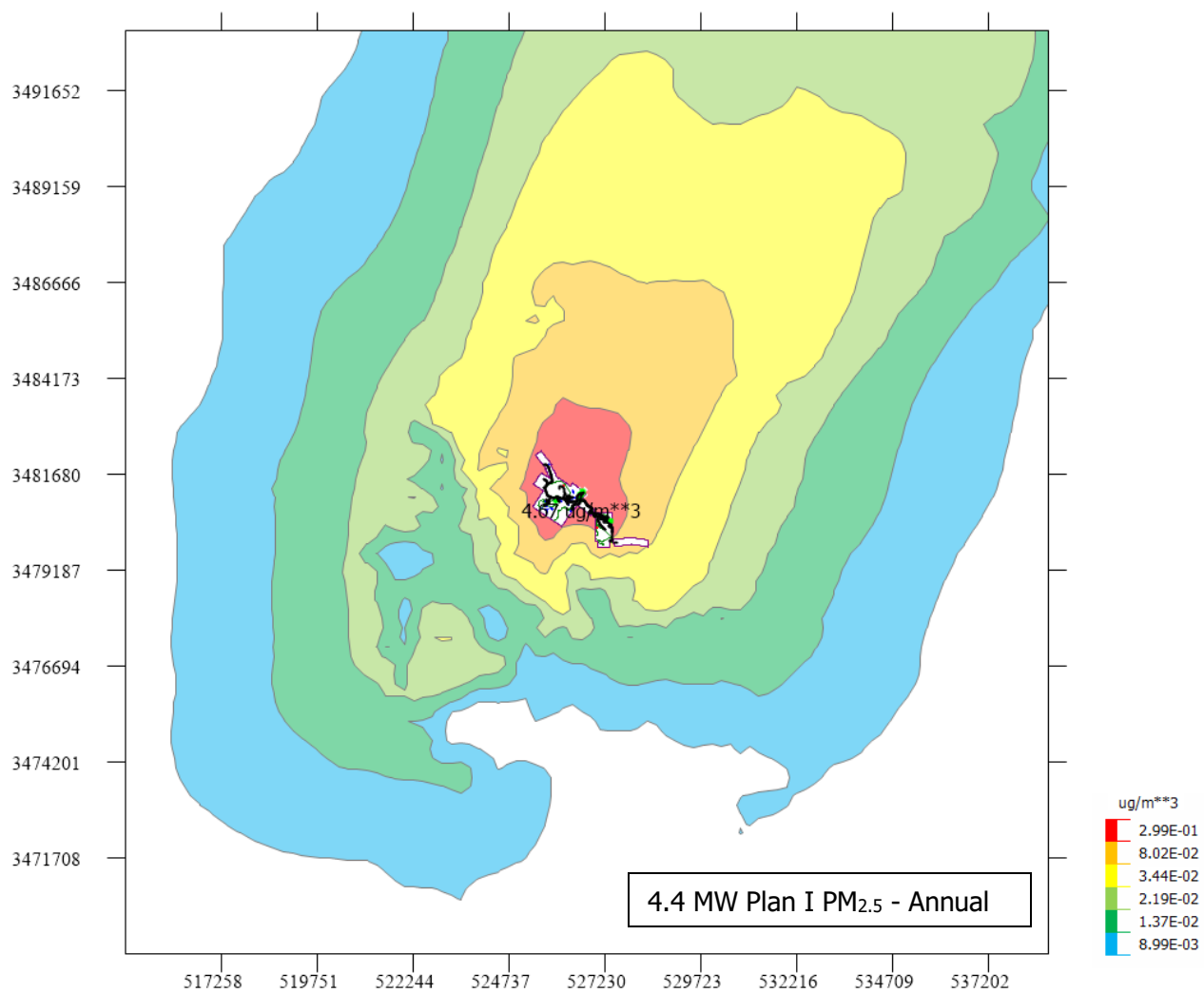
### 4.4 MW Plan I PM10 - 24 Hour



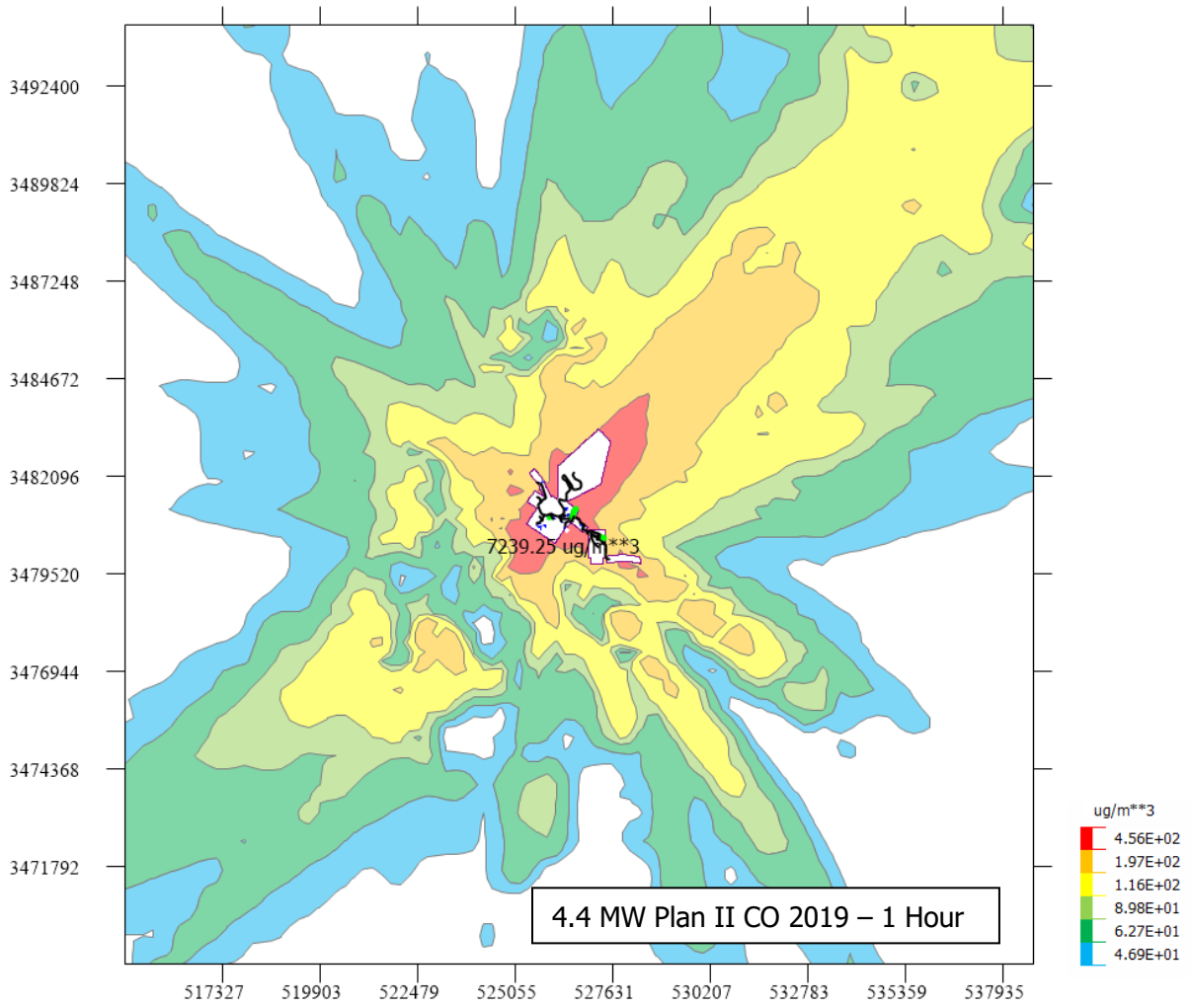
### 4.4 MW Plan I PM<sub>2.5</sub> – 24 Hour



### 4.4 MW Plan I PM<sub>2.5</sub> – Annual

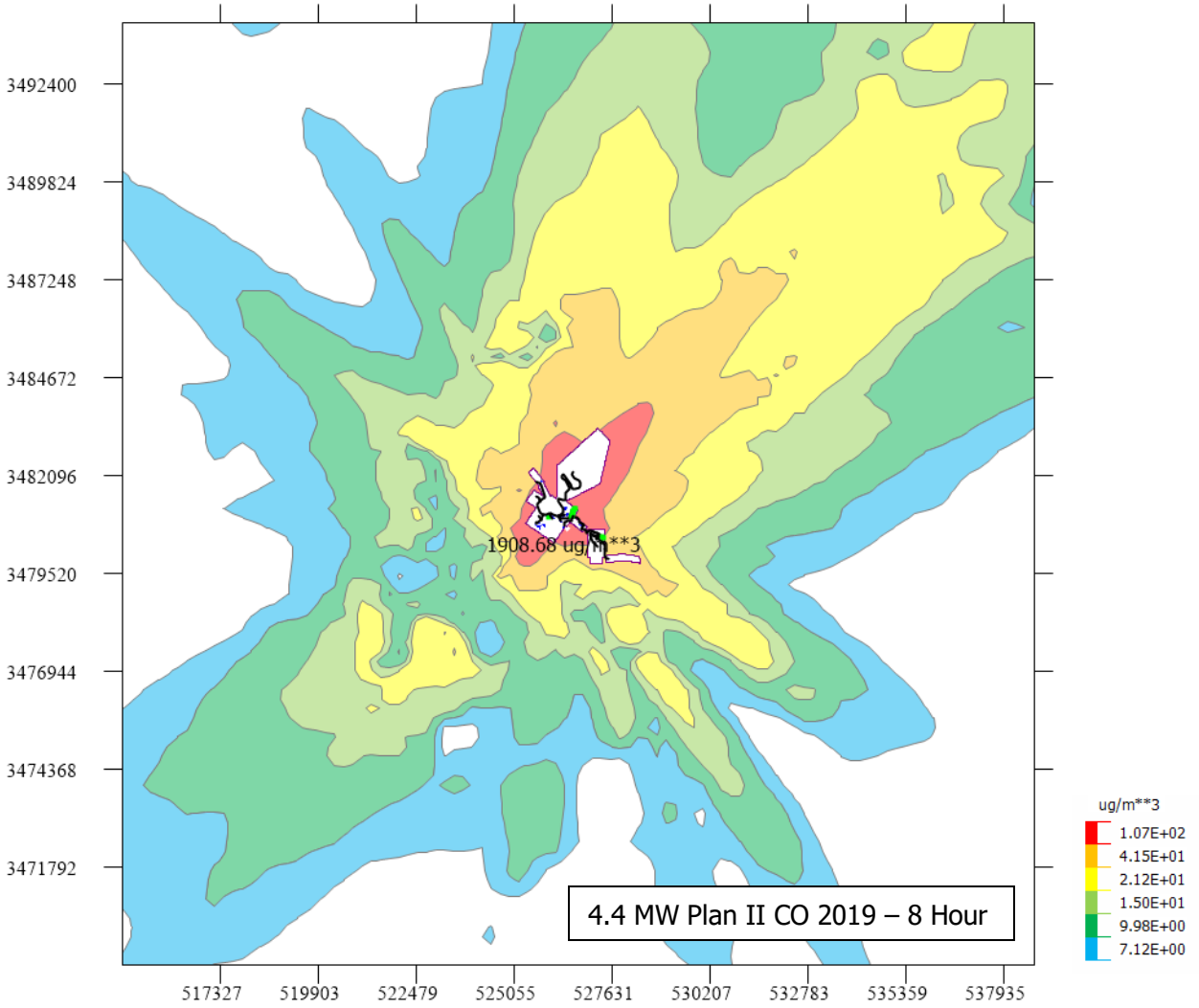


### 4.4 MW Plan II CO 2019 - 1 Hour

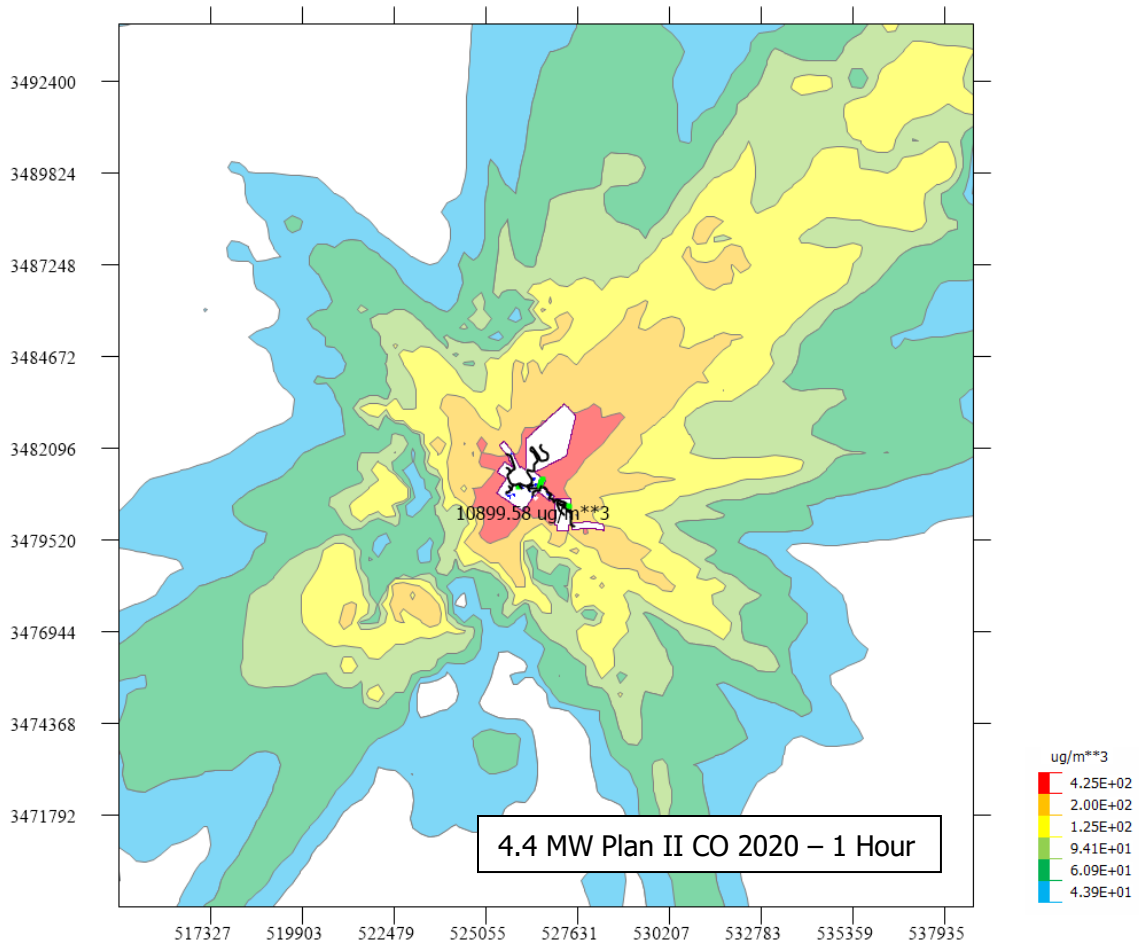




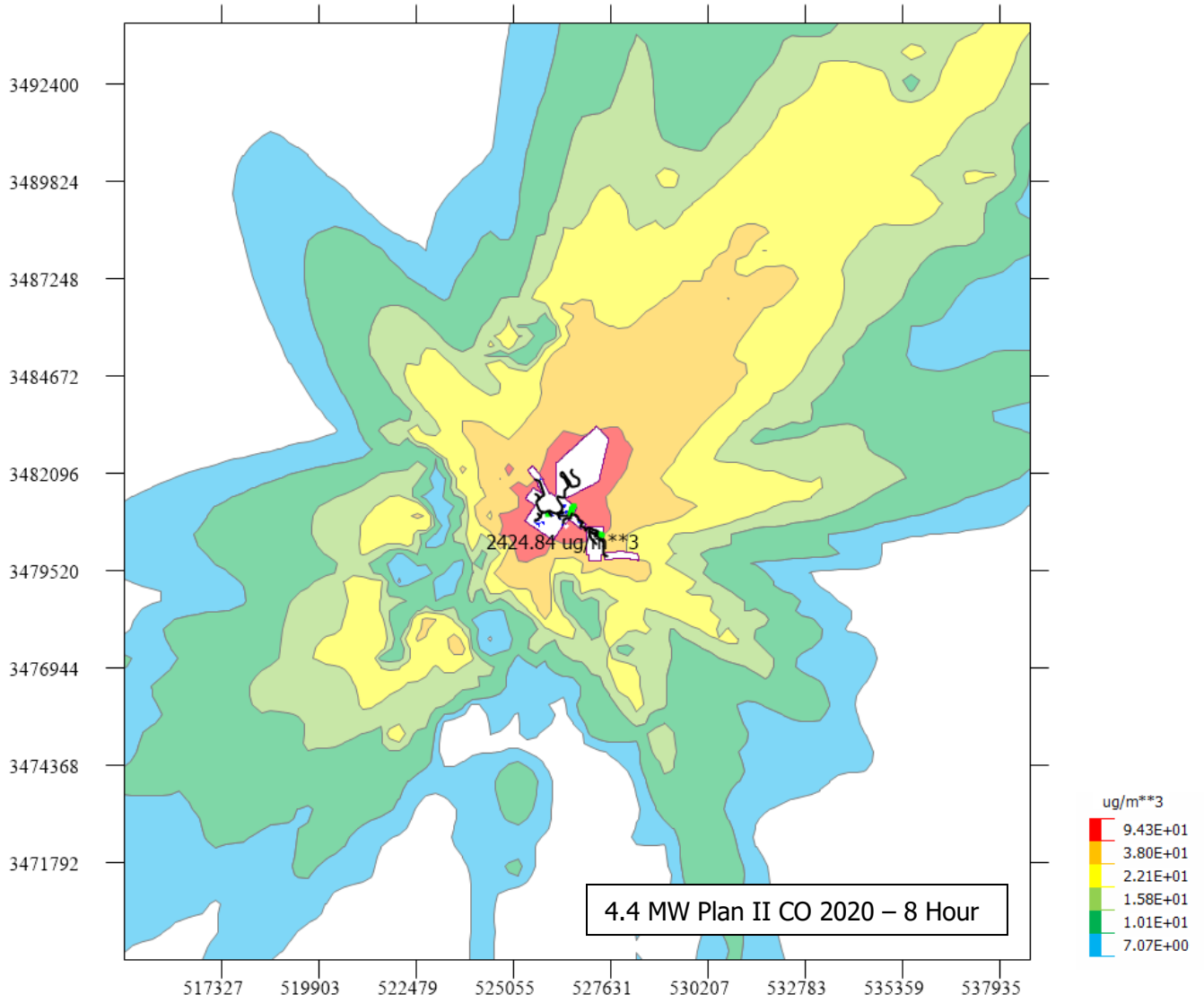
### 4.4 MW Plan II CO 2019 - 8 Hour



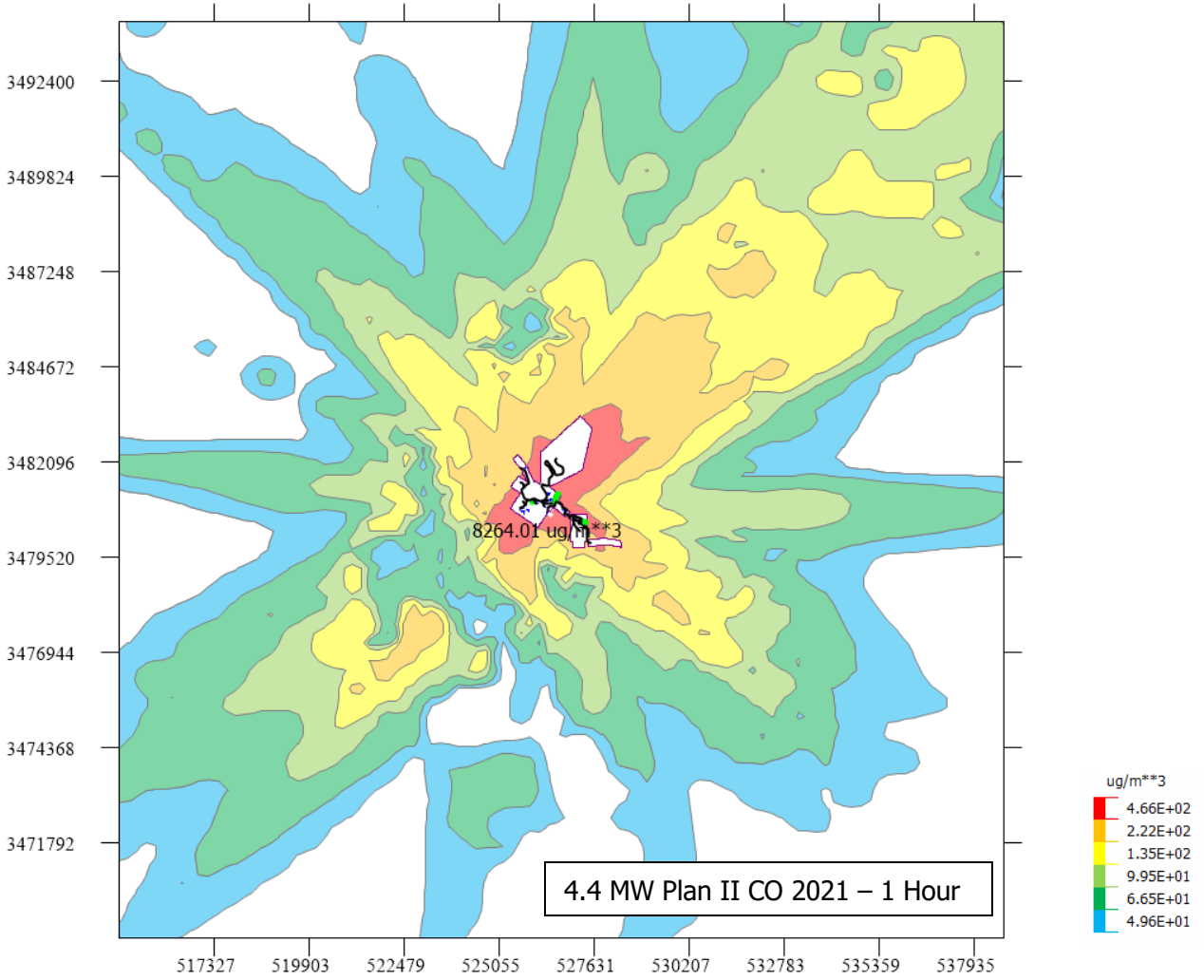
### 4.4 MW Plan II CO 2020 - 1 Hour



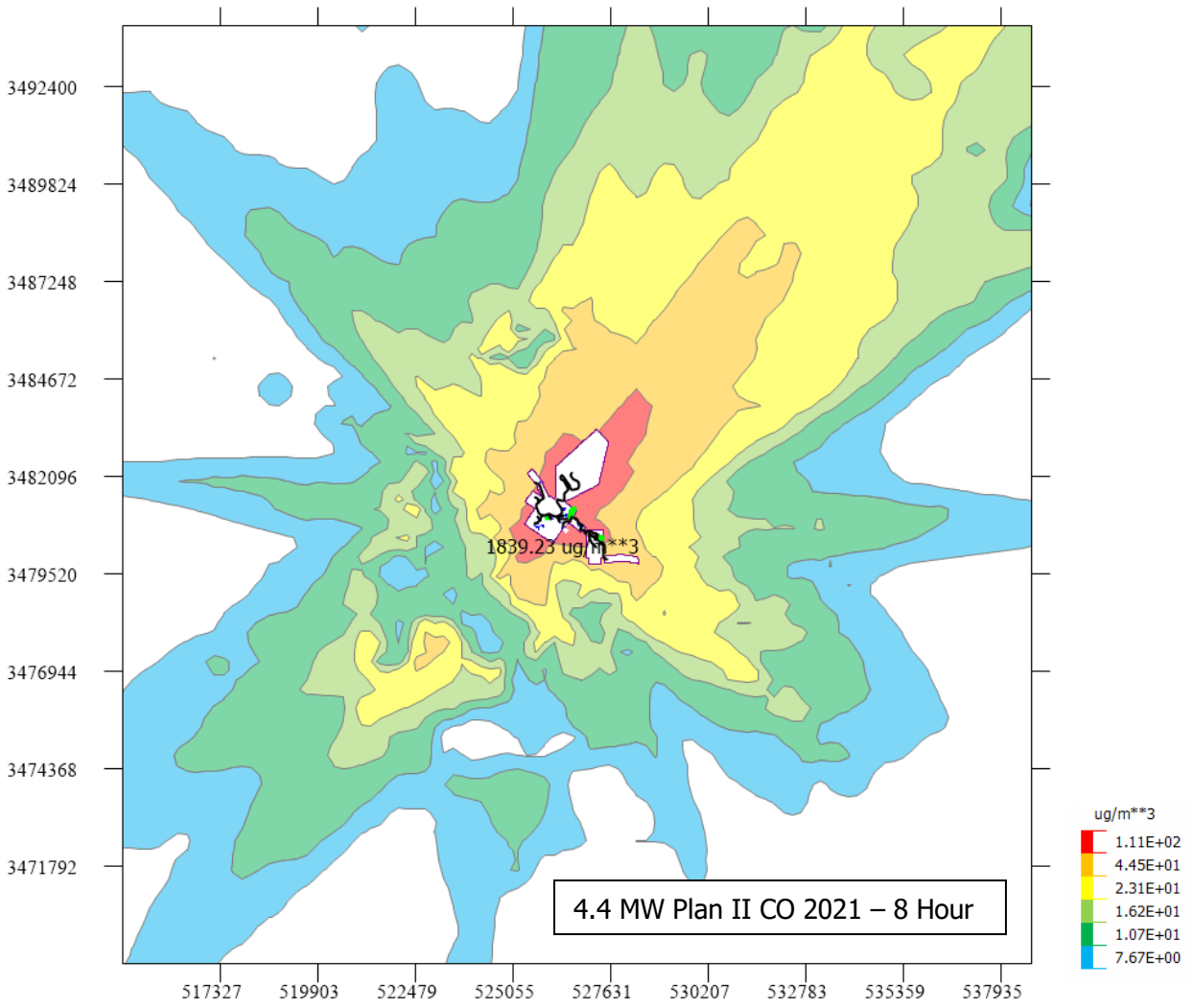
### 4.4 MW Plan II CO 2020 - 8 Hour



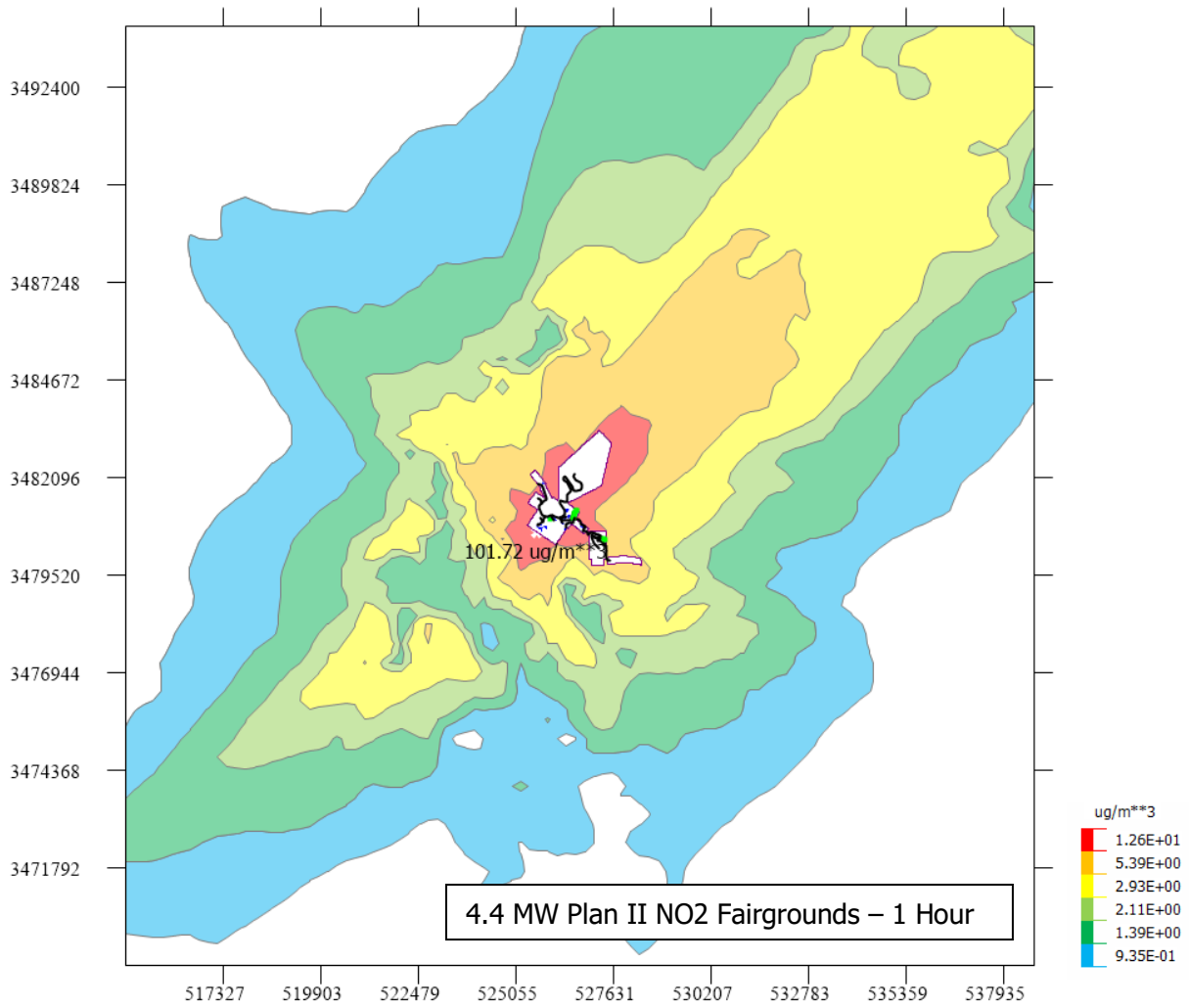
### 4.4 MW Plan II CO 2021 - 1 Hour



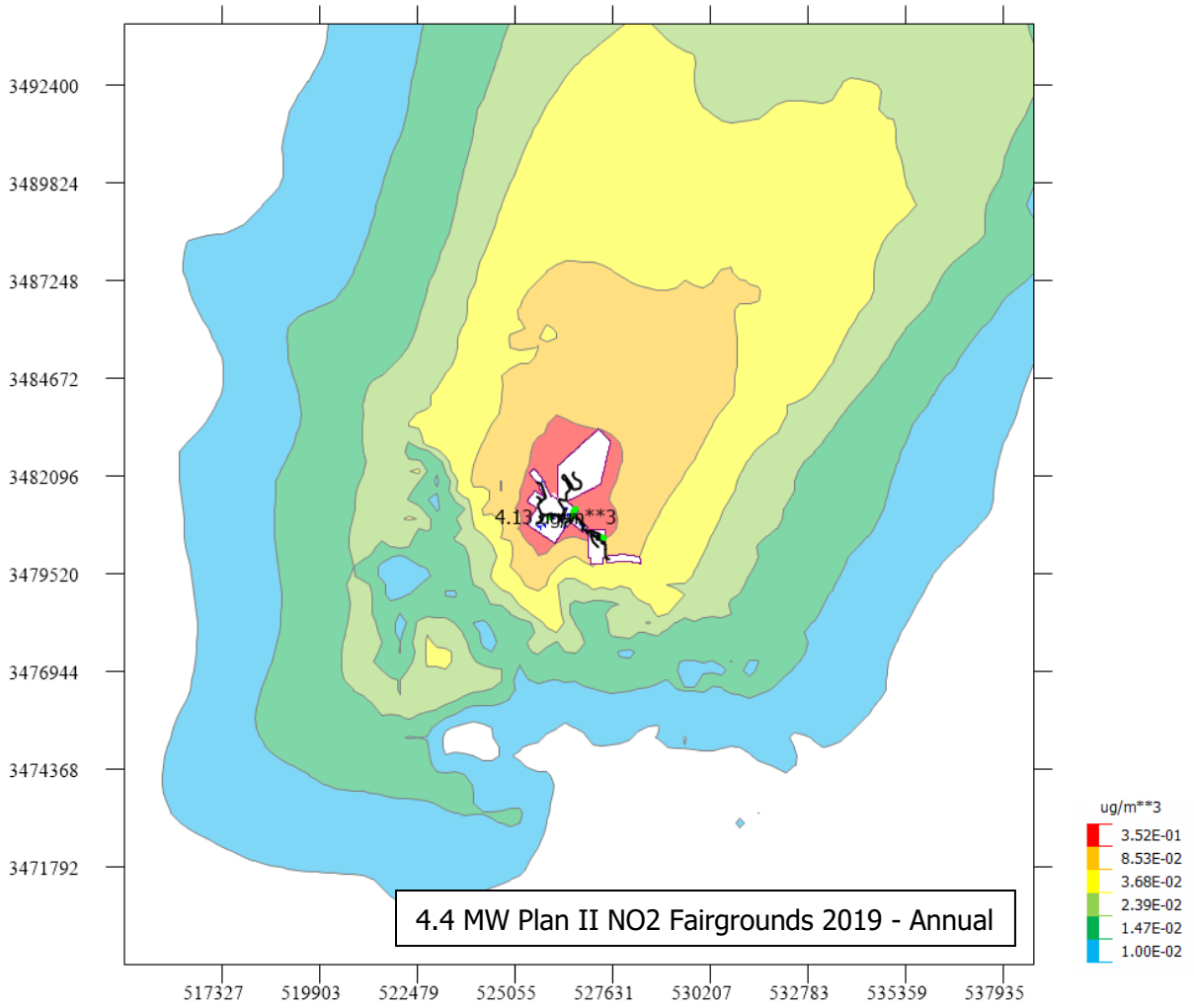
### 4.4 MW Plan II CO 2021 - 8 Hour



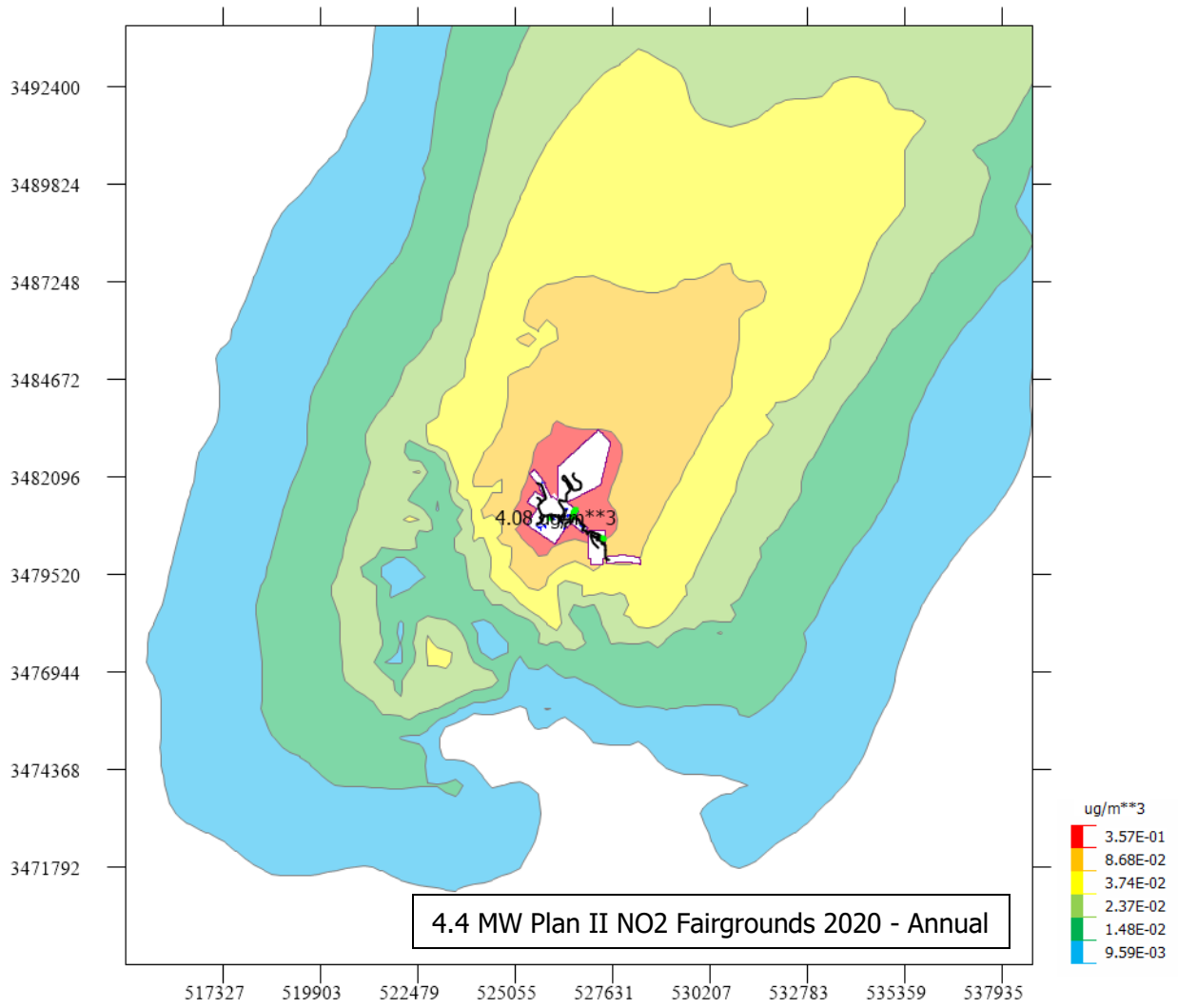
### 4.4 MW Plan II NO<sub>2</sub> Fairgrounds - 1 Hour



### 4.4 MW Plan II NO<sub>2</sub> Fairgrounds 2019 – Annual

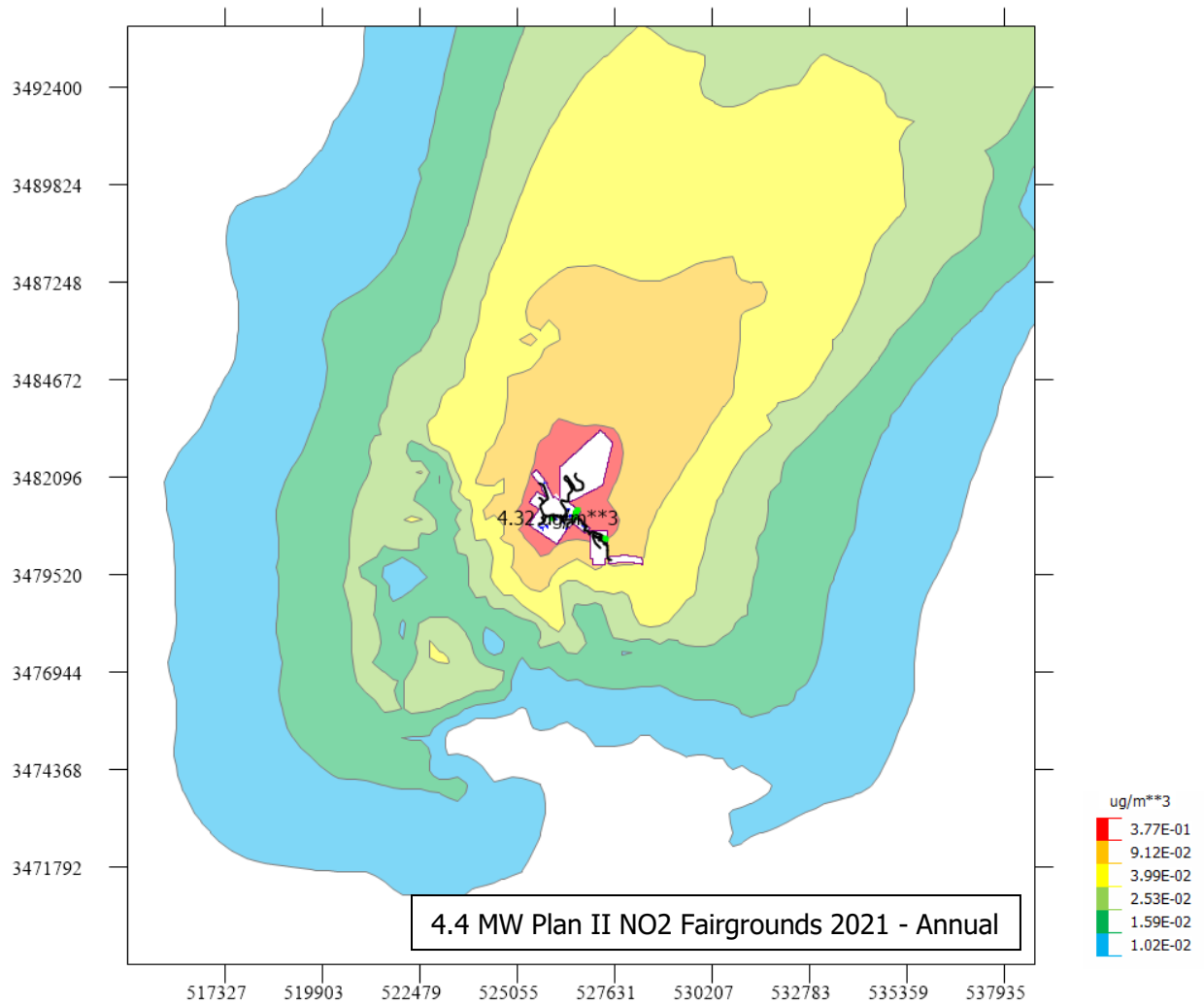


### 4.4 MW Plan II NO<sub>2</sub> Fairgrounds 2020 – Annual

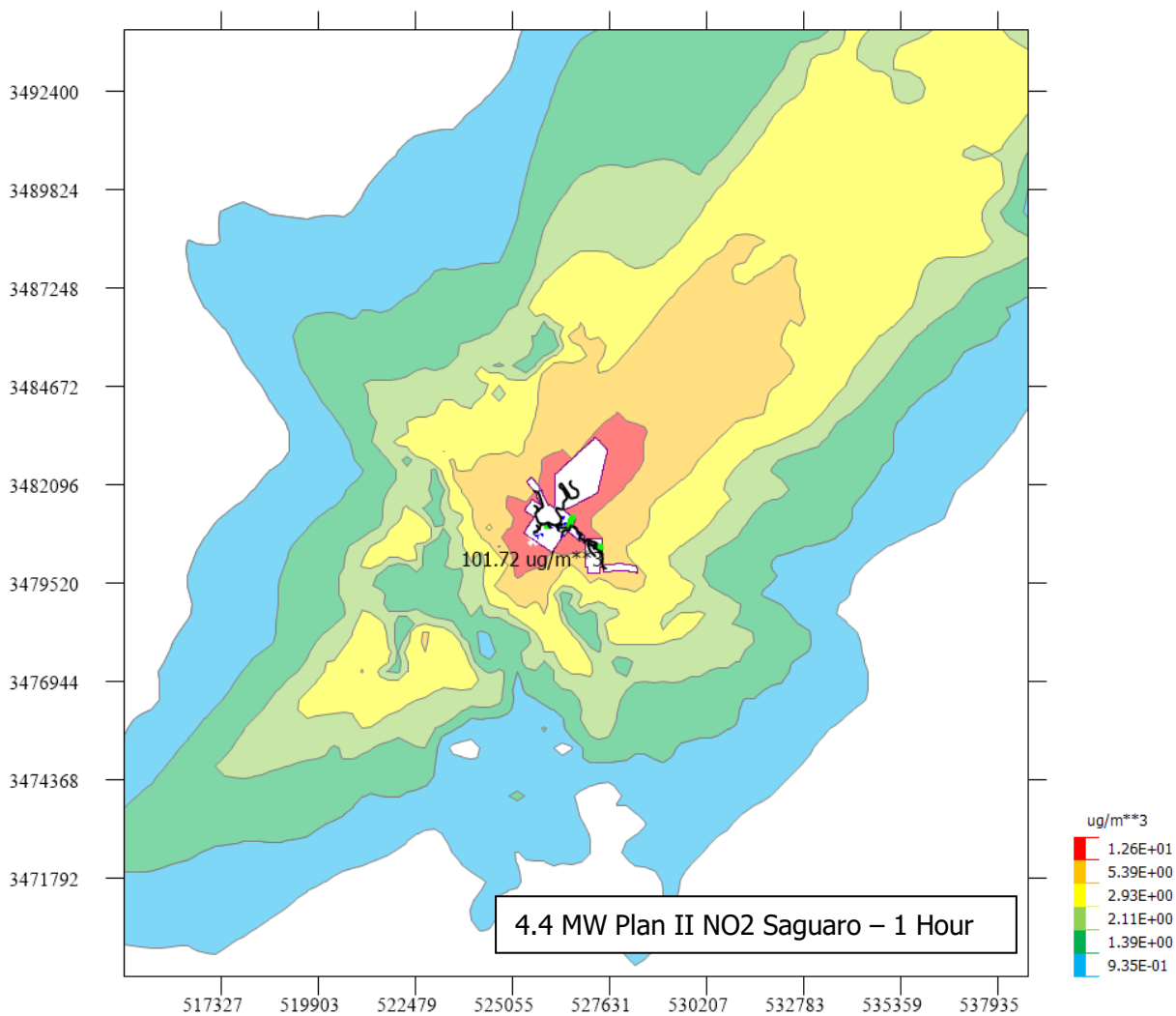




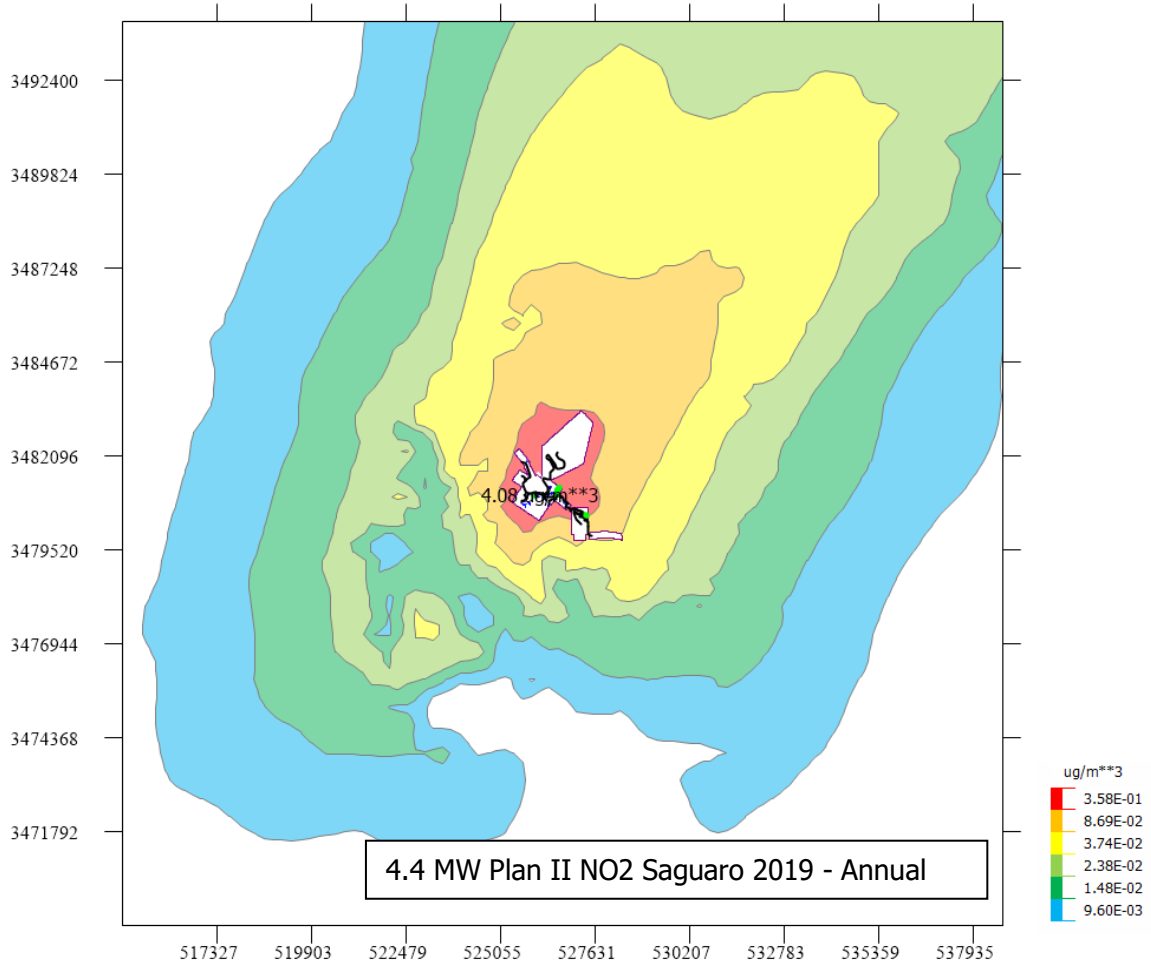
### 4.4 MW Plan II NO<sub>2</sub> Fairgrounds 2021 – Annual



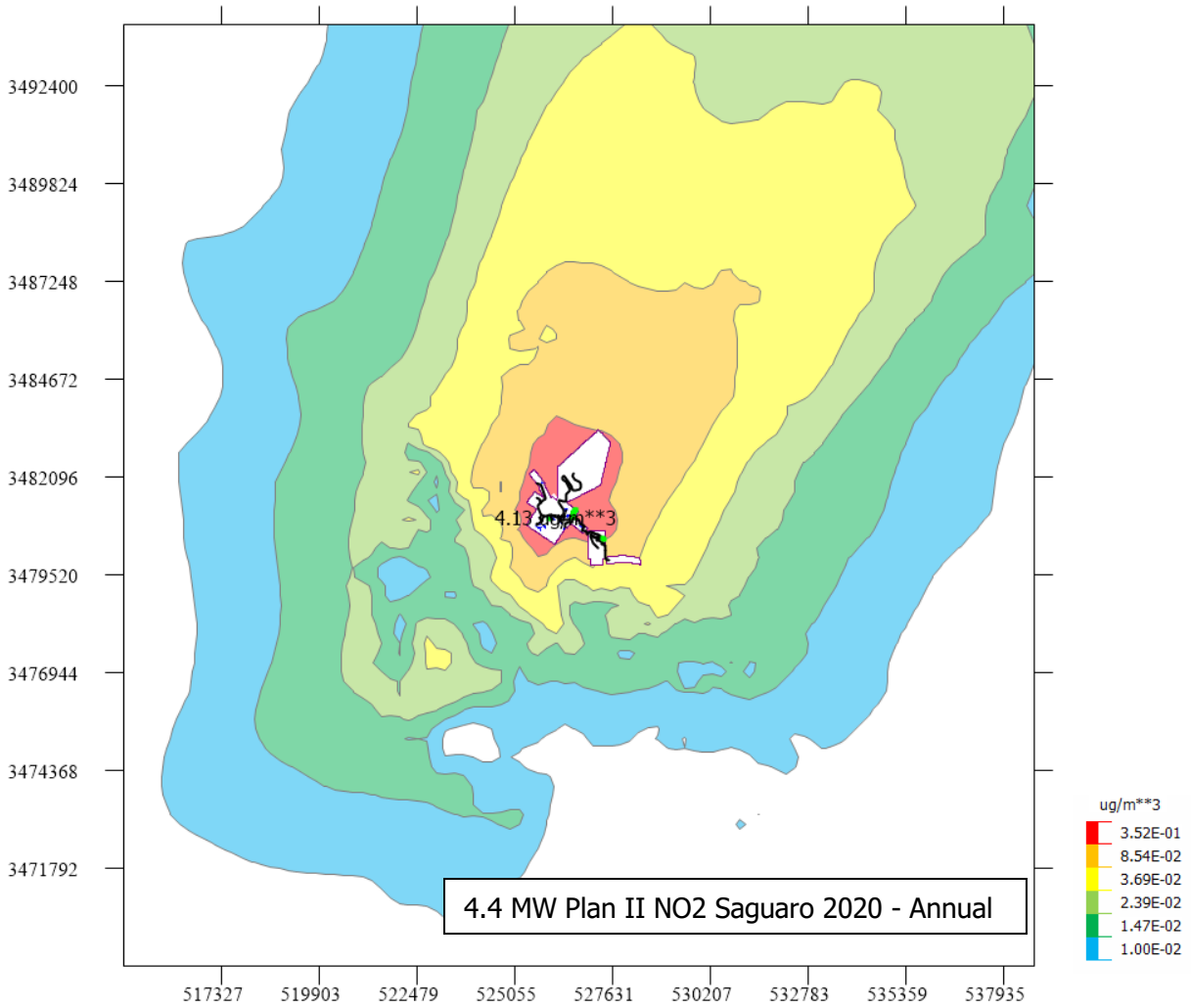
### 4.4 MW Plan II NO<sub>2</sub> Saguaro - 1 Hour



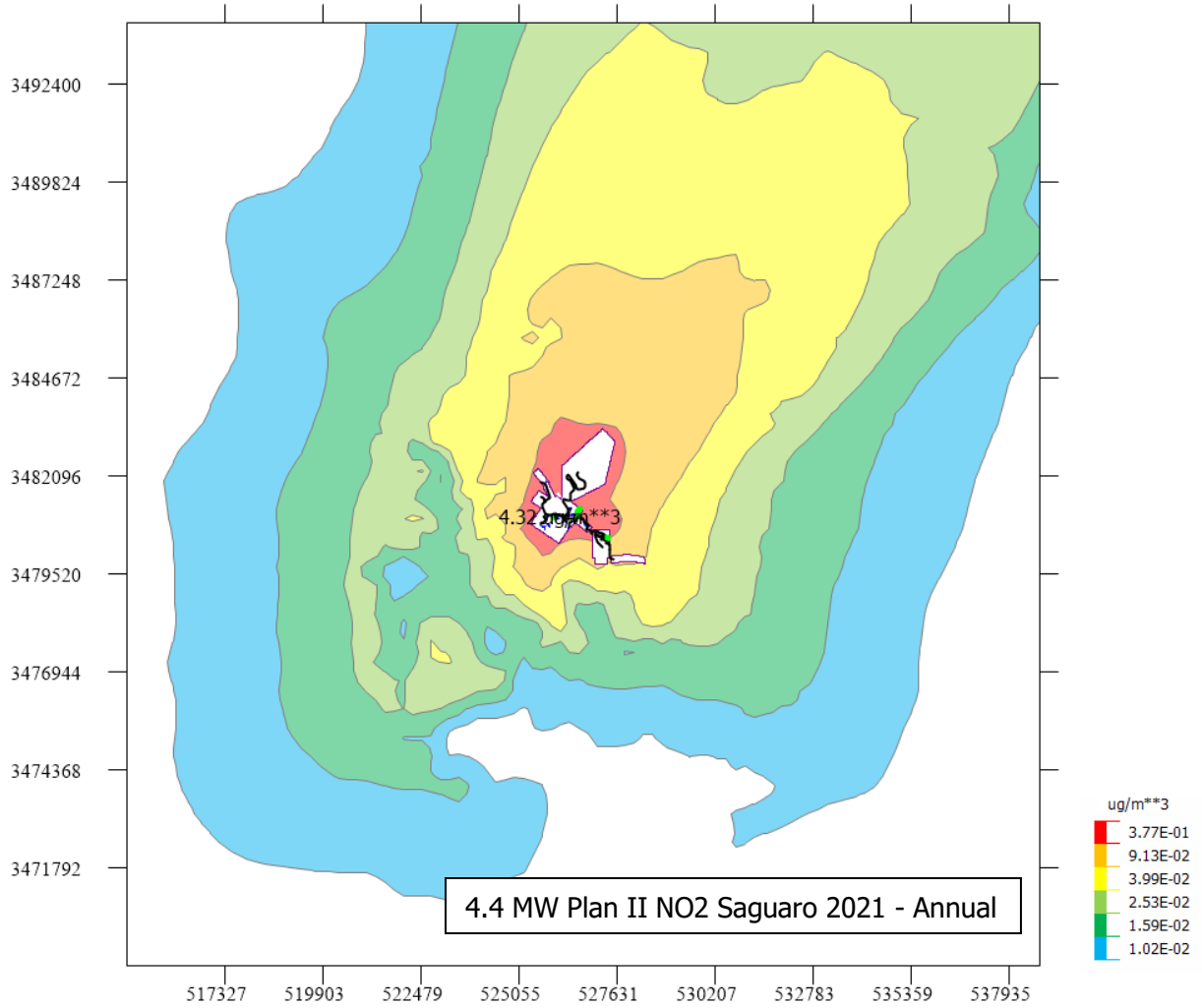
### 4.4 MW Plan II NO<sub>2</sub> Saguaro 2019 – Annual



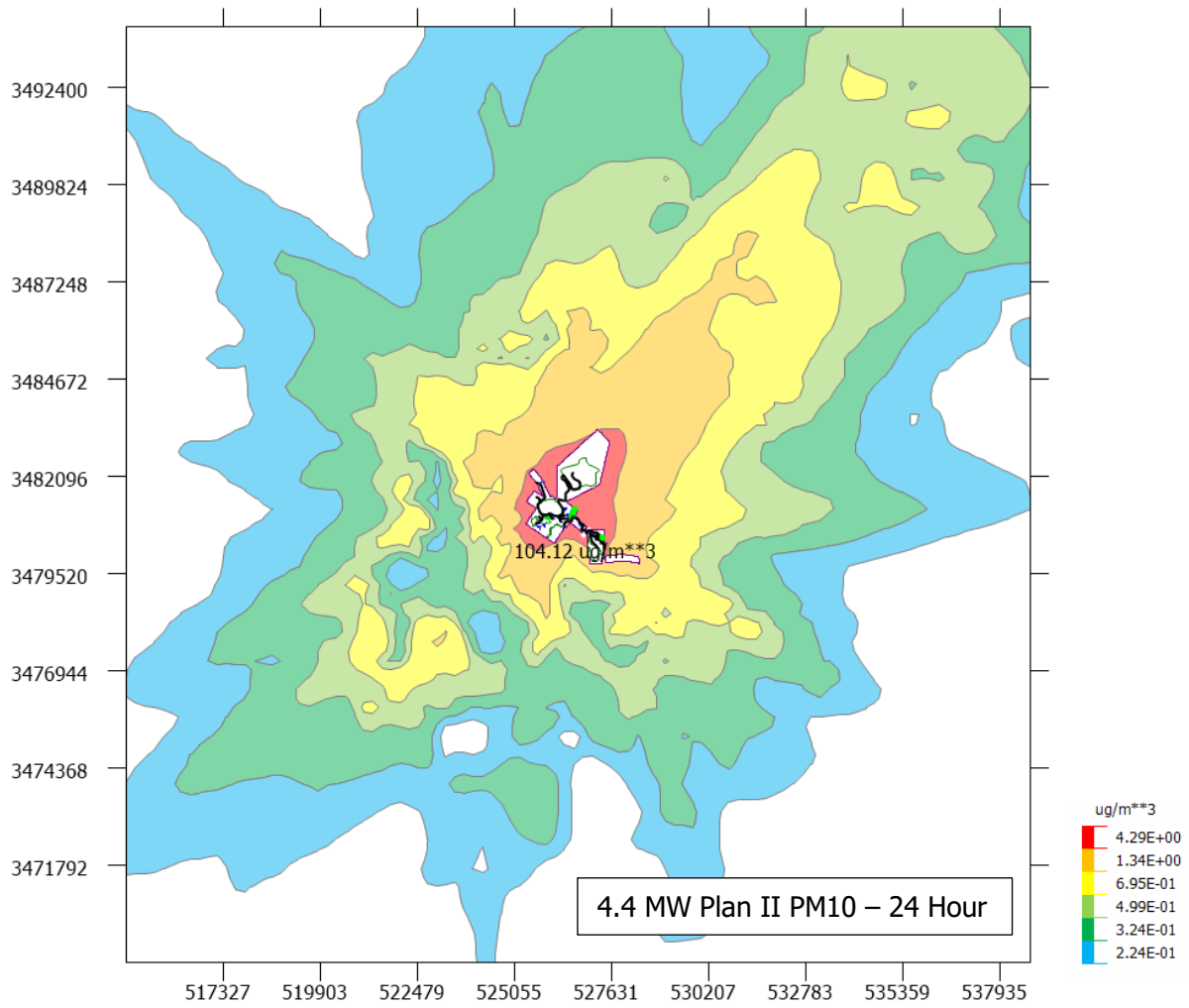
### 4.4 MW Plan II NO<sub>2</sub> Saguaro 2020 – Annual



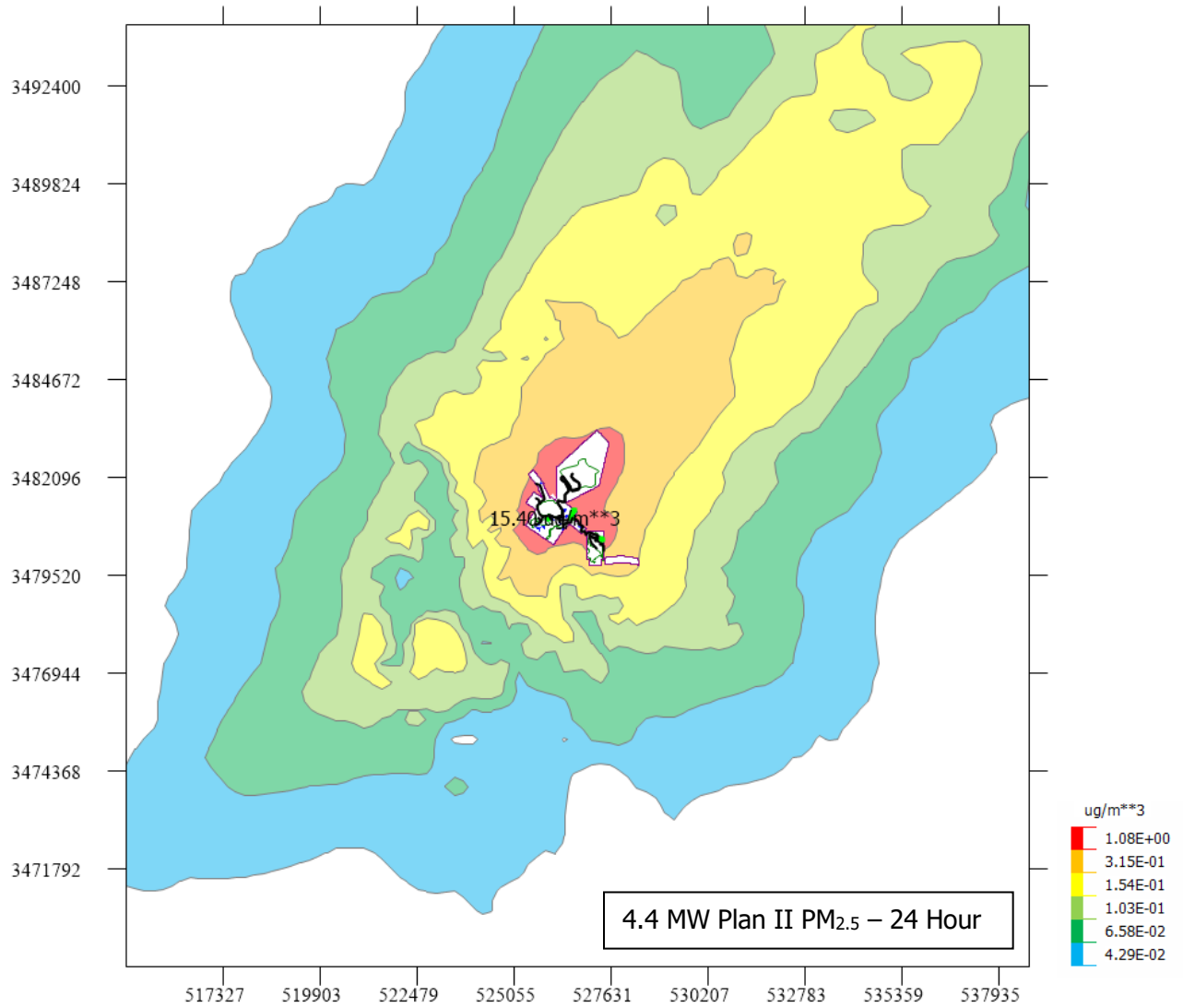
### 4.4 MW Plan II NO<sub>2</sub> Saguaro 2021 – Annual



### 4.4 MW Plan II PM10 - 24 Hour



### 4.4 MW Plan II PM<sub>2.5</sub> - 24 Hour



### 4.4 MW Plan II PM<sub>2.5</sub> – Annual

