TECHNICAL REVIEW AND EVALUATION
OF THE CRUSHING AND SCREENING GENERAL PERMIT

I. INTRODUCTION

The Crushing and Screening General Permit is a permit for a facility class (crushing and screening plants) that contains 10 or more facilities that are similar in nature, have substantially similar emissions, and would be subject to the same or substantially similar requirements. The general permit will last for 5 years from the date of its issuance. Equipment that is covered under the general permit will be required to have an "Authorization to Operate" (ATO). The ATO will identify the piece of equipment by having the manufacture, date of manufacture, maximum capacity, and serial number and /or equipment number along with the hours of operation limitation depending on the equipment and the county it is operating in. This general permit allows for portable crushing and screening plants to move to other locations statewide. This general permit also allows the Permittee to co-locate a concrete batch plant with the crushing and screening plant.

The Permittee that applies for an ATO under the general permit shall pay to the Department a flat permit processing fee of $500 with the submittal of the permit application. The Permittee must also pay, for each calendar year, the applicable administrative or inspection fees as described in the Arizona Administrative Code Title 18, Chapter 2, Article 5, section 511 (A.A.C. R18-2-511).

Due the fact that this is a statewide general permit there is the potential that the Permittee may operate in a PM_{10} or $PM_{2.5}$ non-attainment area in the state of Arizona. The $PM_{10/2.5}$ non-attainment areas for purposes of this permit are listed in Table 1 below:

Table 1: Non-Attainment Area Summary

County	Townships	Section Where Visual Representation Is Shown
Maricopa	All	N/A
Pinal County and the Phoenix Planning Area	T1S, R8E, T2S, R8E, T3S, R7E, T3S, R8E, T4S, R8E, (excluding all lands within the Gila River Indian Community). T5S, R5E – R8E (excluding all lands within the Gila River Indian Community). T6S, R3E – R8E, T7S, R3E – R8E Sections 1-6. Phoenix Planning Area: T1N, R8E.	Appendix A
Santa Cruz	The portions of the following Townships which are within the State of Arizona and lie east of 111 degrees longitude:T23S-R13E, T23S-R14E, T24S-R13E and T24S-R14E	Appendix B

County	Townships	Section Where Visual Representation Is Shown
Gila and Pinal	T1S-R13E (sections 7–36); T1S-R14E (sections 25–36);T2S-R13E; T2S-R14E; T2S-R15E; T3S-R13E; T3S-R14E; T3S-R15E; T3S-R16E (except that portion in the San Carlos Apache Indian Reservation); T4S-R13E; T4S-R14E; T4S-R15E; T4S-R16E; T5S-R13E; T5S-R14E; T5S-R15E; T5S-R16E; T6S-R13E; T6S-R14E; T6S-R15E; and T6S-R16E. Miami planning area T1N-R13E; T1N-R14E; T1N-R15E; T1S-R13E (sections 1–6); T1S-R14E (sections 1-24); T1S-R14 1/2E; and T1S-R15E.	Appendix C
Pima	T11S-R9E, T11S-R10E, T11S-R11E, T11S-R12E, T12S-R8E, T12S-R9E, T12S-R10E, T12S-R11E and T12S-R12E. The Ajo planning area Township T12S, R6W, T12S, R5W (Sections 6–8, 17-20, and 29-32).	Appendix D
Yuma	T7S-R21W, T7S-R22W, T8S-R21W, T8S-R22W, T8S-R23W, T8S-R24W, T9S-R21W, T9S-R22W, T9S-R23W, T9S-R24W, T9S-R25W, T10S-R21W, T10S-R22W, T10S-R23W, T10S-R24W, and T10S-R25W	Appendix E
Cochise	T23S, R25E, T23S-R26E, T23S-R27E, T23S-R28E, T24S-R25E, T24S-R26E, T24S-R27E, and T24S-R28E	Appendix F

Notes: 1. No operations are permitted within the portion of Pinal County: T4S, R3E – R4E, T5S, R3E – R4E (excluding sections 12, 13, 24, and 25) identified as "Prohibited Area" in Appendix "A" of the general permit.

2. No operations are permitted in the portions of Santa Cruz County, identified as a non-attainment area in Appendix "B", on any day that the Nogales particle pollution risk forecast at http://www.azdeq.gov/environ/air/ozone/nogales.pdf shows the risk of unhealthy particulate matter concentration to be High or if the Air Quality Index (AQI) for $PM_{2.5}$ is forecast as Unhealthy for Sensitive Groups.

II. OPERATING LIMITS AND ASSOCIATED EMISSIONS

Based on the modeled results (refer to Section V for detailed modeling analysis), the production limitations for crushing and screening plants along with collocated concrete batch plants have been established. Table 2 on the following page below summarizes the production limitations:

Table 2: Modeling - Based Production Limitations

Facility	Maximum Daily Operation	
	PM_{10} Attainment Area	PM_{10} Nonattainment Area
Stand-alone crushing and screening plant	6,500 tons per day	4,410 tons per day
Crushing and screening plant collocated with concrete batch plants	C&S: 6,500 tons per day CBP: 1,275 yd^3 per day	C&S: 4,095 tons per day CBP: 1,275 yd^3 per day

In addition to the above limitations, the Permittee may also be subject to operating hour limitations in the ATOs. These limits shall be calculated based on the potential to emit calculations. In no case shall the emissions from the facility exceed the statewide emission limits required to stay below major source thresholds, or the Maricopa County emissions limits which is required to avoid BACT review under Maricopa County Rule 241. These limitations are identified in Table 3 below:

Table 3: Emission Limitations

Pollutants	Statewide Emission limit (excluding Maricopa County)	Emission Limit in Maricopa County	
	(ton/yr)	(lb/day)	(ton/yr)
PM	90	135	22.5
PM_{10}	90	76.5	13.5
CO	90	495	90
NO_x	90	135	22.5
SO_2	90	135	22.5
VOC	90	135	22.5

III. APPLICABLE REGULATIONS

The Department has identified the applicable regulations that apply to each unit at a crushing and screening facility. Table 4 on the following page summarizes the findings of the Department with respect to the regulations that are applicable to each emissions unit.

Table 4: Applicable Regulations Statewide

Unit ID	Control Equipment	Applicable Regulations	Verification
Crushing and Screening Plants (NSPS)	Wet Scrubbers, Spray Bars, wet suppressant, and enclosures.	40 CFR 60 Subpart OOO	New Source Performance Standards Subpart OOO – Standards of Performance for Nonmetallic Mineral Processing Plants. Affected facilities include crushers, grinding mill, screening operation, bucket elevators, belt conveyors, bagging operations, storage bins, and enclosed truck or railcar loading stations built or reconstructed after August 31, 1983.
Crushing and Screening Plants (Non-NSPS)	Wet Scrubbers, Spray Bars, wet suppressant, and enclosures	A.A.C. R18-2-722	Standards of Performance for Existing or Crushed Stone Processing Plants.
Internal Combustion Engines	None	A.A.C. R18-2-719 40 CFR 63 Subpart ZZZZ	Standards of Performance for Existing Stationary Rotating Machinery.
Internal Combustion Engines (NSPS)	None	40 CFR 60 Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.
Internal Combustion Engines (NSPS)	None	40 CFR 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.
Concrete Batch Plants	Baghouses and wet suppressants	A.A.C. R18-2-702.B A.A.C. R18-2-723	The conditions stated here are the opacity limitations.
Boilers	Not Applicable	A.A.C. R18-2-724	Standards of Performance for Fossil-fuel Fired Industrial and Commercial Equipment.
Fugitive Dust	Control Measures	A.A.C. R18-2-604 through R18-2-607.	Emissions from Fugitive Dust Sources.
Mobile Sources	None	A.A.C. R18-2-801 through A.A.C R18-2-806	Emissions from Mobile Source

Table 5: Applicable Regulations for Maricopa County

Unit ID	Start-up date	Control Equipment	Applicable Regulations	Verification
Facility Wide Requirements	Not Applicable	None	Maricopa County Rule 100	General Provisions and Definitions
			Maricopa County Rule 200	Permit Requirements
			Maricopa County Rule 220	Non-Title V Permit Provisions
			Maricopa County Rule 230	General Permits
			Maricopa County Rule 300	Visible Emissions
			Maricopa County Rule 310	Fugitive Dust from Dust-Generating Operations
			Maricopa County Rule 312	Abrasive Blasting
			Maricopa County Rule 315	Spray Coating Operations
			Maricopa County Rule 320	Odors And Gaseous Air Contaminants
Crushing and Screening Operation Concrete Batch Plants Fugitive Dust	Not Applicable	Wet Scrubbers, Spray Bars, wet suppressants, and enclosures	Maricopa County Rule 316	Nonmetallic Mineral Processing located in Maricopa County
Internal Combustion Engines	Not Applicable	None	Maricopa County Rule 324	Stationary Rotating Machinery subject to State rules located in Maricopa County.

Table 6: Regulations for Pima and Pinal Counties

Unit ID	Start-up date	Control Equipment	Applicable Regulations	Verification
Crushing and Screening Plants in Pima	Not Applicable	Spray Bars	P.C.C. §§17.16.010.C P.C.C. §§17.16.040 P.C.C. §§17.16.050 P.C.C. §§17.16.060 P.C.C. §§17.16.070 P.C.C. §§17.16.080 P.C.C. §§17.16.090 P.C.C. §§17.16.100 P.C.C. §§17.16.360 P.C.C. §§17.16.370 P.C.C. §§17.16.380 P.C.C. §§17.16.710 SIP Rule 343	The regulations listed are applicable to Crushing and Screening Plants located in Pima County.
Crushing and Screening Plants in Pinal	Not Applicable	Spray Bars	Pinal Code §4-2-040 Pinal Code §4-2-050 Pinal Code §5-5-180 Pinal Code §5-5-190 Pinal Code §5-5-200	The regulations listed are applicable to Crushing and Screening Plants located in Pinal County.

IV. PERIODIC MONITORING, RECORDKEEPING AND REPORTING REQUIREMENTS

A. Facility wide General Requirements

1. The Permittee must maintain daily records of the operating hours of the equipment covered under the General Permit which are subject to an hourly restriction.

2. The Permittee must maintain records of the total daily throughput of material for the crushing and screening plant (in tons per day) and for the concrete batch plant (in cubic yards per day) covered under this General Permit.

3. The Permittee must keep on-site records of maintenance performed on all emission related equipment.

4. At the time the compliance certifications are submitted, the Permittee must submit reports of all monitoring, recordkeeping, and testing activities required by the permit within during that period.

5. The Permittee is required to conduct a monthly visual survey on all process equipment and all fugitive dust sources. If the source appears to exceed the standard, the Permittee must conduct an EPA Reference Method 9 observation. The Permittee must keep records of all surveys and EPA Reference Method 9 observations performed. These records will include the emission point observed, location of observer, name of observer, date and time of observation, and the results of the observation. If the observation shows a Method 9 opacity reading in excess of the opacity standard, the Permittee will be required to initiate appropriate corrective action to reduce the opacity below the standard. The Permittee will keep a record of the corrective action performed. These logs must be maintained on-site and be available to ADEQ representative upon request.

V. AIR DISPERSION MODELING ANALYSIS

A. Model Selection

The most recent version of the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD, version 11103) was used in this modeling analysis. AERMOD is the EPA's preferred near-field dispersion modeling system for a wide range of regulatory applications. The AERMOD modeling system includes four regulatory components:

- AERMOD: the dispersion model
- AERMAP: the terrain processor for AERMOD
- AERMET: the meteorological data processor for AERMOD
- BRIPPRIME: the building input processor

The terrain processor (AERMAP) and the building input processor (BRIPPRIME) were not used in this analysis because both of them require site-specific information. Moreover, an assumption of "Flat Terrain" was believed to be reasonable.

The terrain processor (AERMAP) and the building input processor (BRIPPRIME) were not used in this analysis because both of them require site-specific information. Additionally, an assumption of "Flat Terrain" was determined to be acceptable, since the emission sources of a crushing & screening plant or a concrete batch plant are mainly ground level sources and the worst-case impacts are expected to occur in or near the process area boundary.

B. Model Source Input

The model source input involves the development of appropriate inputs for dispersion modeling with the AERMOD modeling system.

1. Emission Rate Methodology

Particulate Matter (PM) is the primary pollutant emitted from a crushing & screening plant as well as a concrete batch plant. If there are internal combustion engines (generators) or boilers in the facility, gaseous pollutants such as SO_2, NO_x, and CO are also generated.

a. Determining Emission Rate

Emission rates were estimated according to latest AP-42 emission factors for concrete batching, crushing & screening, internal combustion engines, boilers, wind erosion and unpaved roads. In particular, a consistent approach was developed for estimating $PM_{2.5}$ and PM_{10} emissions for batch drop operations and material transfer operations. This approach was based on AP-42 Section 13.2.4 Equation 1:

$$E = k(0.032)\frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \quad \text{(Equation 1)}$$

Where:
E = emission factor (lb/ton) k = particle size multiplier (dimensionless), 0.35 for PM_{10} and 0.053 for $PM_{2.5}$
U = mean wind speed (miles per hour)
M = material moisture content (%)

State-wide meteorological data sets were reviewed and a mean wind speed of 7.5 miles per hour was determined. Due to very limited data available for the parameter M, the moisture content was set as 5% for controlled emissions.

b. Emission Inventory

A comprehensive emission inventory was developed for a crushing & screening plant with an operating capacity of 315 tons per hour (Table 7). *Note that this capacity is used for the convenience of emission estimation only, and it may not represent the maximum allowable throughput for a crushing & screening plant in the General Permit.* To model the operating capacity other than 315 tons per hour, the emission rates listed in Table 7 were adjusted. Comparatively, the operating capacity for a concrete batch plant in this modeling analysis was fixed at 1275 yd^3 per day, which was previously determined in the General Permit for Concrete Batch Plants. Table 8 lists the corresponding emission rates for all sources in the concrete batch plant. Besides the sources above, emissions from unpaved roads and a large internal combustion engine (generator) were also modeled. The emission rates of pollutants from the two sources are summarized in Table 9.

c. Modeled Emission Rates

Emissions used for modeling must be matched to the averaging time being assessed. For 24-hour PM_{10} and 24-hour $PM_{2.5}$, if a crushing & screening plant was modeled to run at a specific capacity (tons/hour) at a certain hours per day, the modeled hourly emission rates for applicable sources were adjusted by using Emission Rate Flag HROFDY in AERMOD:

$$HROFDY = \frac{\text{Modeled operating capacity (tons/hour)}}{315\ \text{tons/hour}} \times \frac{\text{Modeled operating hours}}{24} \quad \text{(Equation 2)}$$

Most of operations in concrete batch plants and crushing & screening plants are not continuous and the emission sources are typically characterized as intermittent sources. The Emission Rate Flag approach substitutes an intermittent source with a continuous source that emits an identical amount of PM_{10} or $PM_{2.5}$ over a 24-hour time period. Such treatment should provide a reasonable approximation of 24-hour average impact. For SO_2 and CO, maximum hourly emission rates were modeled for comparisons to their short-term air quality standards. As the SO_2 emissions are relatively small, maximum hourly emission rates were also used to provide a conservative estimation for annual impacts. To model annual average NO_2 concentrations, annual averaging hourly emission rates were used. Moreover, the NO_2/NOx ratio was set as 0.75, the national annual default value.

Table 7: Maximum Hourly Emission Rates for Crushing & Screening Plant*

Area Source			
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*
CS_WEAS	Aggregate Storage Pile	1.16E-05	1.16E-05
CS_WEFS	Fines Storage Pile	2.61E-05	2.61E-05
CS_TRANS	Transfer Points	5.10E-03	2.52E-02
Volume Sources			
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*
CS_PCRSH	Primary Crusher-Jaw	3.98E-03	2.15E-02

CS_SCR1	Screen #1	1.99E-03	2.94E-02
CS_SCR2	Screen #2	1.99E-03	2.94E-02
CS_FSCR	Fine Screen	4.41E-03	8.75E-02
CS_SCRSH	Secondary Crusher -Core	3.98E-03	2.15E-02
CS_TCRSH	Tertiary Crusher	2.87E-03	1.55E-02
CSLT01	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT02	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT03	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT04	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT05	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT06	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT07	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT08	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT09	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT10	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT11	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT12	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT13	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT14	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT15	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT16	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT17	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT18	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT19	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT20	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT21	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT22	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT23	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT24	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT25	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT26	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT27	C&S Loader Traffic	5.70E-04	4.34E-03
CSLT28	C&S Loader Traffic	5.70E-04	4.34E-03

Table 8: Maximum Hourly Emission Rates for Concrete Batch Plant*

Point Sources						
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*	*NOx (g/s)*	*SO_2 (g/s)*	*CO (g/s)*
CBP_CSTS	Cement Supplement Transfer to Cement Silo	1.80E-04	1.20E-03	-	-	-
CBP_CTCS	Cement Transfer to Cement Silo	8.40E-05	5.60E-04	-	-	-
CBP_BOIL	Boiler	1.17E-02	1.17E-02	1.80E-01	1.92E-03	4.51E-02

Area Sources			
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*
CBP_WEAS	Aggregate Storage Pile	1.16E-05	1.16E-05
CBP_WESS	Sand Storage Pile	6.53E-06	6.53E-06

Volume Sources			
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*
CBP_ADGS	Aggregate Delivery to Ground Storage	4.98E-04	3.29E-03
CBP_SDGS	Sand Delivery to Ground Storage	3.81E-04	2.52E-03
CBP_ATC	Aggregate Transfer to Conveyor	4.98E-04	3.29E-03
CBP_STC	Sand Transfer to Conveyor	3.81E-04	2.52E-03
CBP_ATEB	Aggregate Transfer to Elevation Bins	4.98E-04	3.29E-03
CBP_STEB	Sand Transfer to Elevation Bins	3.81E-04	2.52E-03
CBP_WHL	Weigh Hopper Loading	3.98E-04	2.65E-03
CBP_TML	Truck Mix Loading (controlled)	1.56E-03	1.04E-02
CBPLT01	CBP Loader Traffic	5.70E-04	4.34E-03
CBPLT02	CBP Loader Traffic	5.70E-04	4.34E-03
CBPLT03	CBP Loader Traffic	5.70E-04	4.34E-03

Table 9 Maximum Hourly Emission Rates for Other Sources

Point Sources						
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*	*NOx (g/s)*	*SO_2 (g/s)*	*CO (g/s)*
GEN_LAR	Generator >= 600 hp	8.84E-02	8.84E-02	3.03E+00	1.53E-03	6.95E-01
Volume Sources						
Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*			
TRUCK01	Truck Traffic	3.05E-04	2.50E-03			
TRUCK02	Truck Traffic	3.05E-04	2.50E-03			
TRUCK03	Truck Traffic	3.05E-04	2.50E-03			
TRUCK04	Truck Traffic	3.05E-04	2.50E-03			
TRUCK05	Truck Traffic	3.05E-04	2.50E-03			
TRUCK06	Truck Traffic	3.05E-04	2.50E-03			
TRUCK07	Truck Traffic	3.05E-04	2.50E-03			
TRUCK08	Truck Traffic	3.05E-04	2.50E-03			
TRUCK09	Truck Traffic	3.05E-04	2.50E-03			
TRUCK10	Truck Traffic	3.05E-04	2.50E-03			
TRUCK11	Truck Traffic	3.05E-04	2.50E-03			
TRUCK12	Truck Traffic	3.05E-04	2.50E-03			
TRUCK13	Truck Traffic	3.05E-04	2.50E-03			
TRUCK14	Truck Traffic	3.05E-04	2.50E-03			
TRUCK15	Truck Traffic	3.05E-04	2.50E-03			
TRUCK16	Truck Traffic	3.05E-04	2.50E-03			
TRUCK17	Truck Traffic	3.05E-04	2.50E-03			
TRUCK18	Truck Traffic	3.05E-04	2.50E-03			
TRUCK19	Truck Traffic	3.05E-04	2.50E-03			
TRUCK20	Truck Traffic	3.05E-04	2.50E-03			
TRUCK21	Truck Traffic	3.05E-04	2.50E-03			
TRUCK22	Truck Traffic	3.05E-04	2.50E-03			
TRUCK23	Truck Traffic	3.05E-04	2.50E-03			
TRUCK24	Truck Traffic	3.05E-04	2.50E-03			
TRUCK25	Truck Traffic	3.05E-04	2.50E-03			
TRUCK26	Truck Traffic	3.05E-04	2.50E-03			
TRUCK27	Truck Traffic	3.05E-04	2.50E-03			
TRUCK28	Truck Traffic	3.05E-04	2.50E-03			
TRUCK29	Truck Traffic	3.05E-04	2.50E-03			
TRUCK30	Truck Traffic	3.05E-04	2.50E-03			
TRUCK31	Truck Traffic	3.05E-04	2.50E-03			
TRUCK32	Truck Traffic	3.05E-04	2.50E-03			
TRUCK33	Truck Traffic	3.05E-04	2.50E-03			
TRUCK34	Truck Traffic	3.05E-04	2.50E-03			
TRUCK35	Truck Traffic	3.05E-04	2.50E-03			
TRUCK36	Truck Traffic	3.05E-04	2.50E-03			
TRUCK37	Truck Traffic	3.05E-04	2.50E-03			
TRUCK38	Truck Traffic	3.05E-04	2.50E-03			
TRUCK39	Truck Traffic	3.05E-04	2.50E-03			

Table 9 (continued)

Source ID	*Source Description*	*$PM_{2.5}$ (g/s)*	*PM_{10} (g/s)*
TRUCK40	Truck Traffic	3.05E-04	2.50E-03
TRUCK41	Truck Traffic	3.05E-04	2.50E-03
TRUCK42	Truck Traffic	3.05E-04	2.50E-03
TRUCK43	Truck Traffic	3.05E-04	2.50E-03
TRUCK44	Truck Traffic	3.05E-04	2.50E-03
TRUCK45	Truck Traffic	3.05E-04	2.50E-03
TRUCK46	Truck Traffic	3.05E-04	2.50E-03
TRUCK47	Truck Traffic	3.05E-04	2.50E-03
TRUCK48	Truck Traffic	3.05E-04	2.50E-03
TRUCK49	Truck Traffic	3.05E-04	2.50E-03
TRUCK50	Truck Traffic	3.05E-04	2.50E-03
TRUCK51	Truck Traffic	3.05E-04	2.50E-03
TRUCK52	Truck Traffic	3.05E-04	2.50E-03
TRUCK53	Truck Traffic	3.05E-04	2.50E-03
TRUCK54	Truck Traffic	3.05E-04	2.50E-03

C. Source Layout

The layout of crushing & screening plants generally differs from one site to another. To simplify the modeling analysis, a generic site plan was developed for a crushing & screening plant alone or co-located with a concrete batch plant, as shown in Figure 1 and Figure 2 on the following page, respectively. The layout of sources was determined according to the site plans of several existing plants.

D. Source Release Parameters

The emission sources, categorized by source type (release characteristics), are as follows:

Point Sources: cement silo, boiler, and generator;

Area Sources: aggregate storage pile wind erosion, sand storage pile wind erosion, combined transfer points in crushing & screening plants;

Volume Sources: crushing & screening operations, batch drop operations, material transfer operations, trucks/front-end loaders traveling on unpaved roads.

Tables 10-12 summarize the source release parameters used in the modeling analysis. These parameters were determined following the ADEQ air modeling guidelines as well as the methodology for modeling fugitive dust sources developed by National Stone, Sand & Gravel Association. The representative physical dimensions for stacks, crushers, screens, storage piles, hoppers, bins, silos, trucks, and front-end loaders were determined on the basis of actual measurements or testing data from three facilities in Maricopa County.

Figure 1: Source Layout of a Generic Crushing & Screening Plant (refer to Table 8 and Table 9 for detailed source descriptions)

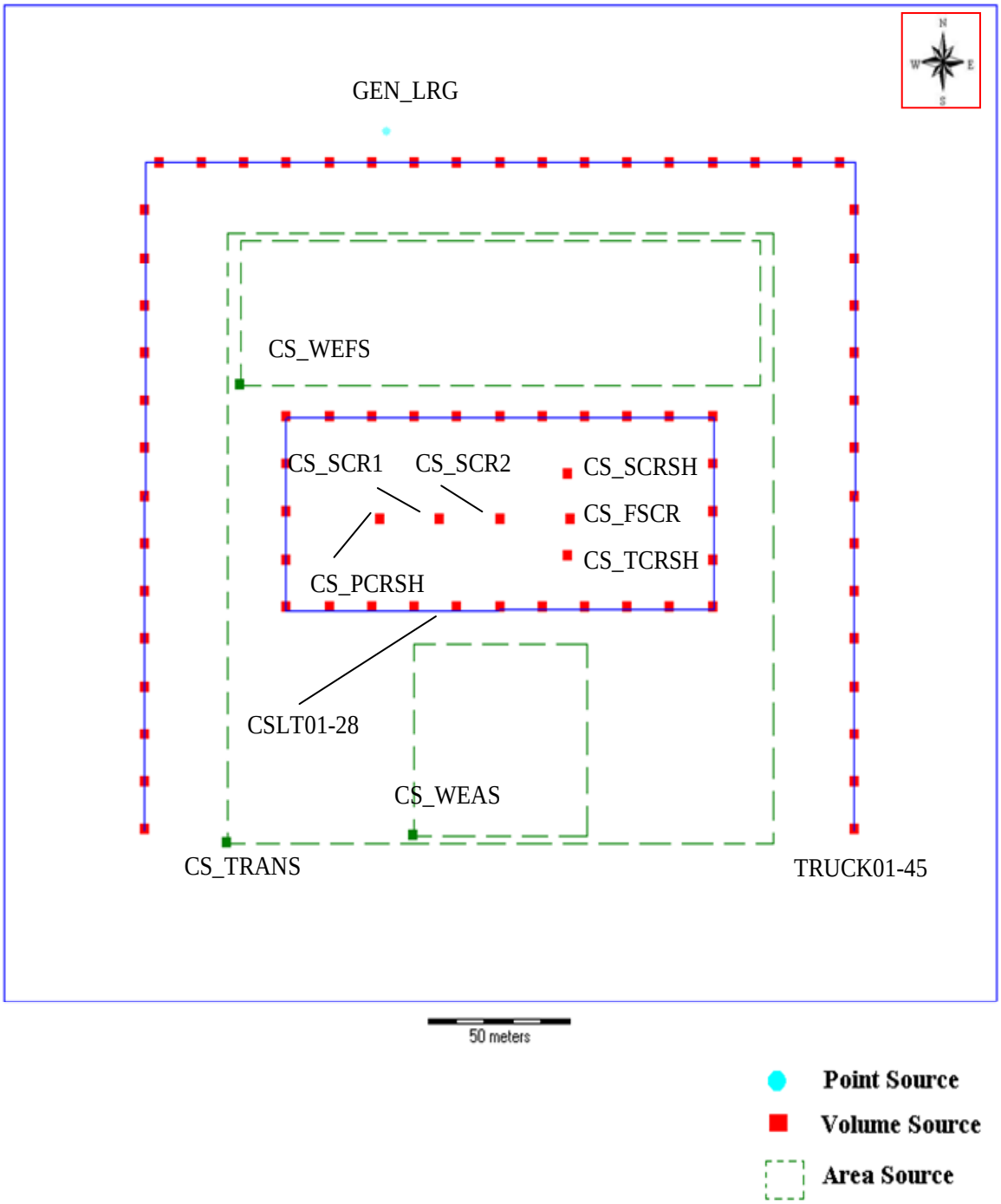


Figure 2: Source Layout of a Generic Crushing and Screening Plant Co-located with a Concrete Batch Plant (refer to Tables 7-9 for detailed source descriptions)

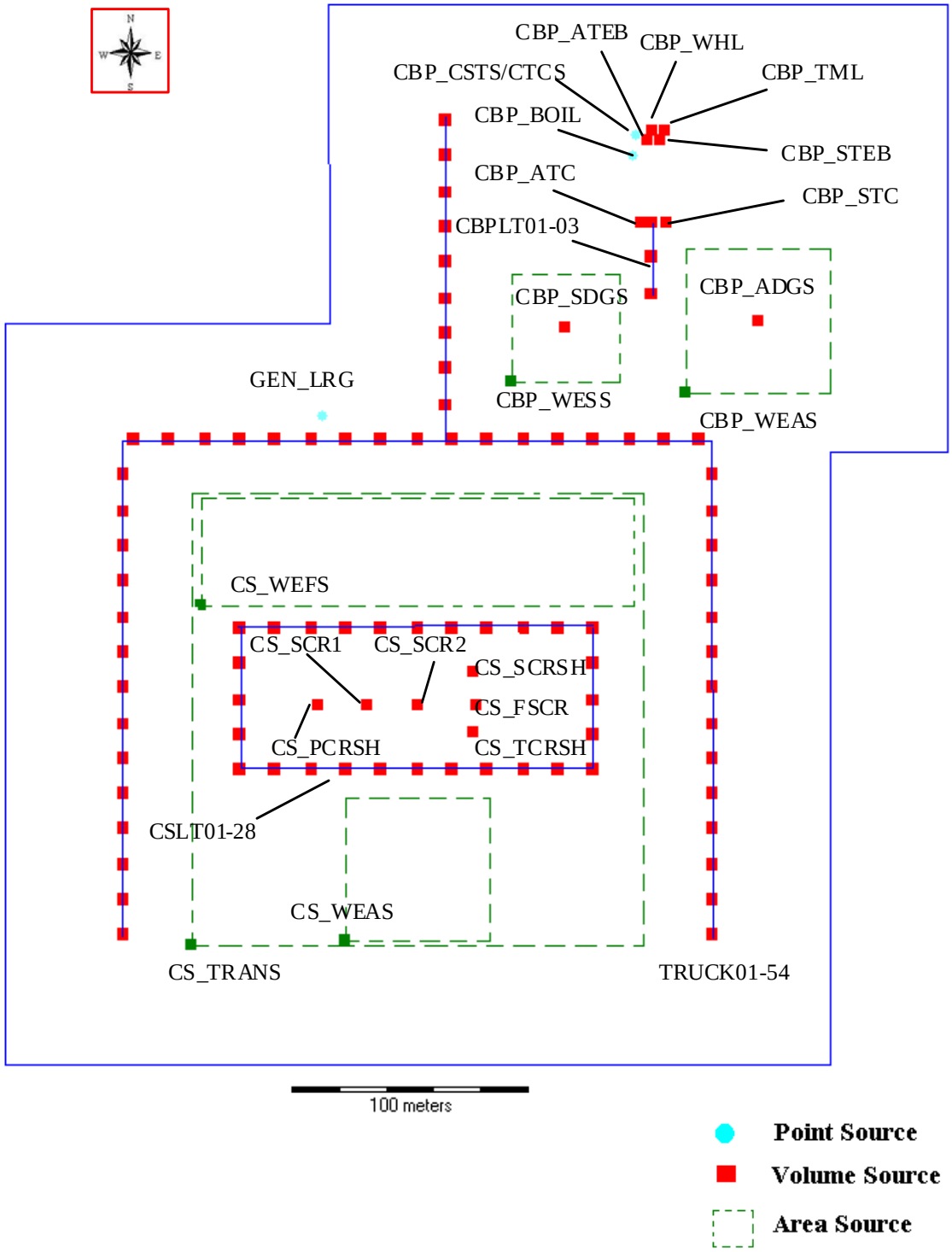


Table 10: Modeling Source Parameters for Crushing & Screening Plant

Area Source					
Source ID	*Source Description*	*Release Height (m)*	X-Length (m)	Y-Length (m)	Angel (degree)
CS_WEAS	Aggregate Storage Pile	1.83	60.96	60.96	0.00
CS_WEFS	Fines Storage Pile	1.83	182.88	45.72	0.00
CS_TRANS	Transfer Points	1.52	192.02	192.02	0.00
Volume Sources					
Source ID	*Source Description*	*Release Height (m)*	Initial Horizontal Dimensions (m)	Initial Vertical Dimensions (m)	
CS_PCRSH	Primary Crusher-Jaw	5.18	0.43	2.41	
CS_SCR1	Screen #1	7.62	0.85	3.54	
CS_SCR2	Screen #2	7.62	0.85	3.54	
CS_FSCR	Fine Screen	7.62	0.85	3.54	
CS_SCRSH	Secondary Crusher -Core	7.62	0.37	3.54	
CS_TCRSH	Tertiary Crusher	6.10	0.27	2.83	
CSLT01	C&S Loader Traffic	3.00	7.00	2.80	
CSLT02	C&S Loader Traffic	3.00	7.00	2.80	
CSLT03	C&S Loader Traffic	3.00	7.00	2.80	
CSLT04	C&S Loader Traffic	3.00	7.00	2.80	
CSLT05	C&S Loader Traffic	3.00	7.00	2.80	
CSLT06	C&S Loader Traffic	3.00	7.00	2.80	
CSLT07	C&S Loader Traffic	3.00	7.00	2.80	
CSLT08	C&S Loader Traffic	3.00	7.00	2.80	
CSLT09	C&S Loader Traffic	3.00	7.00	2.80	
CSLT10	C&S Loader Traffic	3.00	7.00	2.80	
CSLT11	C&S Loader Traffic	3.00	7.00	2.80	
CSLT12	C&S Loader Traffic	3.00	7.00	2.80	
CSLT13	C&S Loader Traffic	3.00	7.00	2.80	
CSLT14	C&S Loader Traffic	3.00	7.00	2.80	
CSLT15	C&S Loader Traffic	3.00	7.00	2.80	
CSLT16	C&S Loader Traffic	3.00	7.00	2.80	
CSLT17	C&S Loader Traffic	3.00	7.00	2.80	
CSLT18	C&S Loader Traffic	3.00	7.00	2.80	
CSLT19	C&S Loader Traffic	3.00	7.00	2.80	
CSLT20	C&S Loader Traffic	3.00	7.00	2.80	
CSLT21	C&S Loader Traffic	3.00	7.00	2.80	
CSLT22	C&S Loader Traffic	3.00	7.00	2.80	
CSLT23	C&S Loader Traffic	3.00	7.00	2.80	
CSLT24	C&S Loader Traffic	3.00	7.00	2.80	
CSLT25	C&S Loader Traffic	3.00	7.00	2.80	
CSLT26	C&S Loader Traffic	3.00	7.00	2.80	

CSLT27	C&S Loader Traffic	3.00	7.00	2.80
CSLT28	C&S Loader Traffic	3.00	7.00	2.80

Table 11: Modeling Source Parameters for Concrete Batch Plants

Point Sources					
Source ID	*Source Description*	*Release Height (m)*	*Stack Temperature (K)*	*Stack Velocity (m/s)*	*Stack Diameter (m)*
CBP_CSTS	Cement Supplement Transfer to Cement Silo	12.20	408.00	4.00	0.32
CBP_CTCS	Cement Transfer to Cement Silo	12.20	408.00	4.00	0.32
CBP_BOIL	Boiler	12.19	533.00	7.62	0.30
Area Sources					
Source ID	*Source Description*	*Release Height (m)*	*X-length*	*Y-length*	*Angel (degree)*
CBP_WEAS	Aggregate Storage Pile	1.83	60.96	60.96	0.00
CBP_WESS	Sand Storage Pile	1.83	45.72	45.72	0.00
Volume Sources					
Source ID	*Source Description*	*Release Height (m)*	*Initial Horizontal Dimensions (m)*	*Initial Vertical Dimensions (m)*	
CBP_ADGS	Aggregate Delivery to Ground Storage	6.17	1.60	2.20	
CBP_SDGS	Sand Delivery to Ground Storage	6.17	1.60	2.20	
CBP_ATC	Aggregate Transfer to Conveyor	3.51	0.85	0.43	
CBP_STC	Sand Transfer to Conveyor	3.51	0.85	0.43	
CBP_ATEB	Aggregate Transfer to Elevation Bins	8.08	0.71	0.43	
CBP_STEB	Sand Transfer to Elevation Bins	8.08	0.71	0.43	
CBP_WHL	Weigh Hopper Loading	4.72	0.85	0.14	
CBP_TML	Truck Mix Loading (controlled)	3.05	0.25	0.50	
CBPLT01	CBP Loader Traffic	3.00	7.00	2.80	

CBPLT02	CBP Loader Traffic	3.00	7.00	2.80
CBPLT03	CBP Loader Traffic	3.00	7.00	2.80

Table 12: Modeling Source Parameters for Other Sources

Point Sources					
Source ID	*Source Description*	*Release Height (m)*	*Stack Temperature (K)*	*Stack Velocity (m/s)*	*Stack Diameter (m)*
GEN_LAR	Generator >= 600 hp	6.71	783.00	30.50	0.20
Volume Sources					
Source ID	*Source Description*	*Release Height (m)*	Initial Horizontal Dimensions (m)	Initial Vertical Dimensions (m)	
TRUCK01	Truck Traffic	3.00	7.00	2.80	
TRUCK02	Truck Traffic	3.00	7.00	2.80	
TRUCK03	Truck Traffic	3.00	7.00	2.80	
TRUCK04	Truck Traffic	3.00	7.00	2.80	
TRUCK05	Truck Traffic	3.00	7.00	2.80	
TRUCK06	Truck Traffic	3.00	7.00	2.80	
TRUCK07	Truck Traffic	3.00	7.00	2.80	
TRUCK08	Truck Traffic	3.00	7.00	2.80	
TRUCK09	Truck Traffic	3.00	7.00	2.80	
TRUCK10	Truck Traffic	3.00	7.00	2.80	
TRUCK11	Truck Traffic	3.00	7.00	2.80	
TRUCK12	Truck Traffic	3.00	7.00	2.80	
TRUCK13	Truck Traffic	3.00	7.00	2.80	
TRUCK14	Truck Traffic	3.00	7.00	2.80	
TRUCK15	Truck Traffic	3.00	7.00	2.80	
TRUCK16	Truck Traffic	3.00	7.00	2.80	
TRUCK17	Truck Traffic	3.00	7.00	2.80	
TRUCK18	Truck Traffic	3.00	7.00	2.80	
TRUCK19	Truck Traffic	3.00	7.00	2.80	
TRUCK20	Truck Traffic	3.00	7.00	2.80	
TRUCK21	Truck Traffic	3.00	7.00	2.80	
TRUCK22	Truck Traffic	3.00	7.00	2.80	
TRUCK23	Truck Traffic	3.00	7.00	2.80	
TRUCK24	Truck Traffic	3.00	7.00	2.80	
TRUCK25	Truck Traffic	3.00	7.00	2.80	
TRUCK26	Truck Traffic	3.00	7.00	2.80	
TRUCK27	Truck Traffic	3.00	7.00	2.80	
TRUCK28	Truck Traffic	3.00	7.00	2.80	
TRUCK29	Truck Traffic	3.00	7.00	2.80	

TRUCK30	Truck Traffic	3.00	7.00	2.80
TRUCK31	Truck Traffic	3.00	7.00	2.80
TRUCK32	Truck Traffic	3.00	7.00	2.80
TRUCK33	Truck Traffic	3.00	7.00	2.80
TRUCK34	Truck Traffic	3.00	7.00	2.80
TRUCK35	Truck Traffic	3.00	7.00	2.80
TRUCK36	Truck Traffic	3.00	7.00	2.80
TRUCK37	Truck Traffic	3.00	7.00	2.80
TRUCK38	Truck Traffic	3.00	7.00	2.80
TRUCK39	Truck Traffic	3.00	7.00	2.80
TRUCK40	Truck Traffic	3.00	7.00	2.80
TRUCK41	Truck Traffic	3.00	7.00	2.80
TRUCK42	Truck Traffic	3.00	7.00	2.80
TRUCK43	Truck Traffic	3.00	7.00	2.80
TRUCK44	Truck Traffic	3.00	7.00	2.80
TRUCK45	Truck Traffic	3.00	7.00	2.80
TRUCK46	Truck Traffic	3.00	7.00	2.80
TRUCK47	Truck Traffic	3.00	7.00	2.80
TRUCK48	Truck Traffic	3.00	7.00	2.80
TRUCK49	Truck Traffic	3.00	7.00	2.80
TRUCK50	Truck Traffic	3.00	7.00	2.80
TRUCK51	Truck Traffic	3.00	7.00	2.80
TRUCK52	Truck Traffic	3.00	7.00	2.80
TRUCK53	Truck Traffic	3.00	7.00	2.80
TRUCK54	Truck Traffic	3.00	7.00	2.80

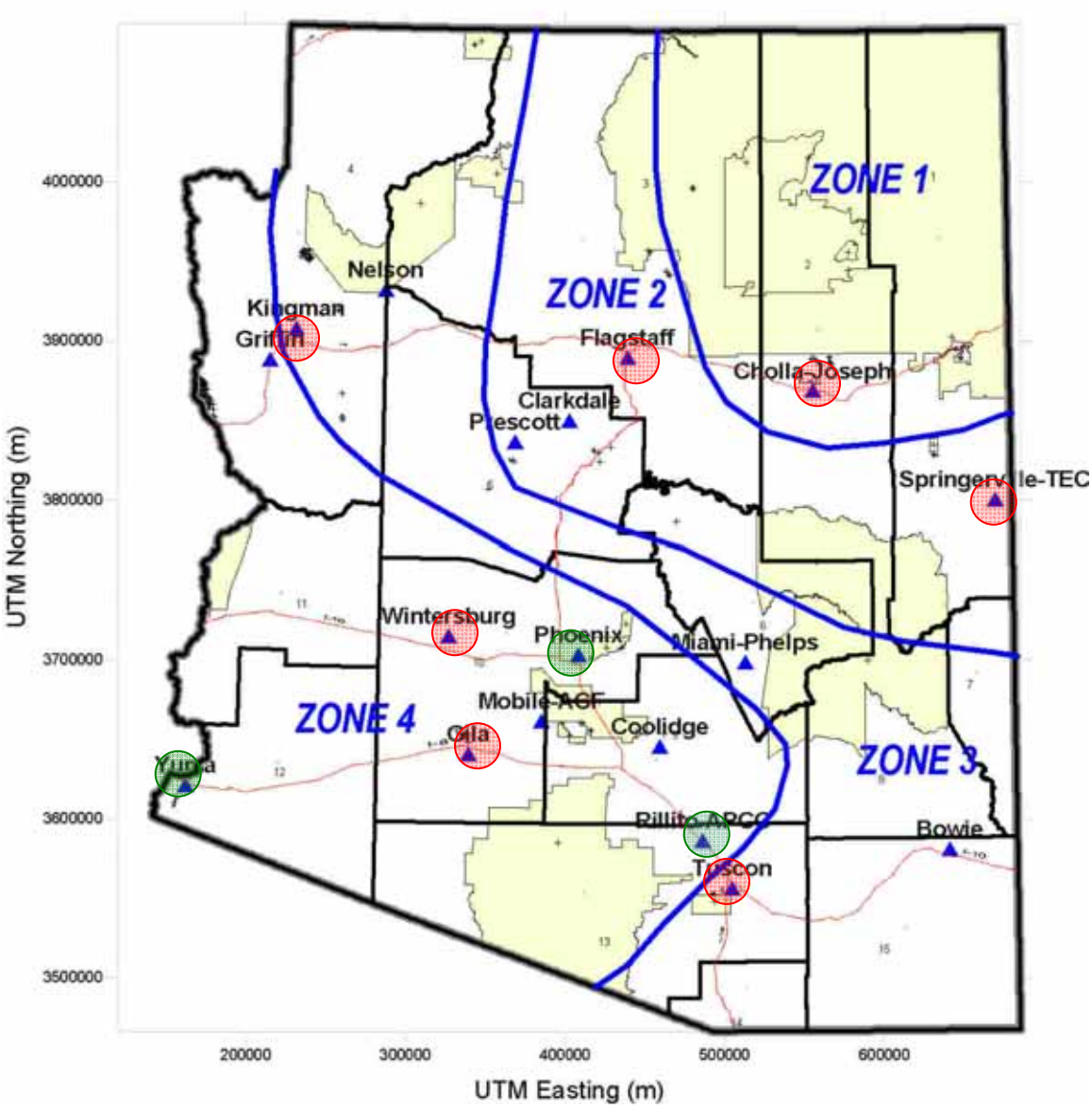
E. Meteorological Data

As shown in Table 13 below, seven meteorological data sets were used to represent the meteorological conditions for PM_{10} attainment areas and three meteorological data sets for PM_{10} non-attainment areas, respectively. All meteorological data are ADEQ AERMET pre-processed data sets, which have been widely used by air permit applicants for regulatory air quality dispersion modeling. The locations of meteorological data sets are shown in Figure 3.

Table 13:Meteorological Data Sets used for AERMOD Modeling Analysis

Data Set Name	Climate Zone	Data Period	For PM_{10} attainment areas or non-attainment areas?
Joseph city	1	04/01/2005-03/31/2006	Attainment areas
Flagstaff NWS	2	01/01/2001-12/31/2005	Attainment areas
Springerville	2	01/01/1995-12/31/1999	Attainment areas
Kingman NWS	3	01/01/2001-12/31/2005	Attainment areas
Tucson NWS	3	01/01/2001-12/31/2005	Attainment areas
Gila Bend	4	01/01/1994-12/31/1995	Attainment areas
Wintersburg	4	01/01/1994-12/31/1998	Attainment areas
Phoenix NWS	4	01/01/2001-12/31/2005	Non-attainment areas
Yuma	4	01/01/2001-12/31/2005	Non-attainment areas
Rillito	4	06/01/2000-05/31/2005	Non-attainment areas

Figure 3: Locations of Meteorological Data Sets Used in the AERMOD Modeling Analysis



Meteorological Sites Used for PM_{10} Attainment Areas

Meteorological Sites Used for PM_{10} Nonattainment Areas

▲ **ADEQ AERMET Meteorological Sites**

ZONE 1-4 AZ Climate Zones

F. Background Concentrations

Table 14 presents the state-level background concentrations that were used in the modeling analysis. Note that the background concentrations used for PM_{10}, SO_2, NO_2 and CO are identical to those shown in the General Permit for Concrete Batch Plant. The background concentrations of $PM_{2.5}$ were determined in accordance with language in EPA's March 23, 2010 memorandum, "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS". For the annual averaging period, the 3-year average of the annual average $PM_{2.5}$ concentrations was used as the background concentration. For the 24-hour averaging period, the 3-year average of the 98th percentile 24-hour average $PM_{2.5}$ concentrations was used as the background concentration. Based on the available monitoring data and attainment/non-attainment classification, the state was classified into four different zones:

1. Pinal County $PM_{2.5}$ Non-Attainment Area

   The monitoring data in this area shows a significant violation for the $PM_{2.5}$ NAAQS, for both the annual and 24-hour standards. Because a modeling compliance demonstration for this area is not possible, the area will be excluded from the applicable coverage in this General Permit. EPA has finalized a Pinal County $PM_{2.5}$ non-attainment area, which is larger than Arizona's recommended area. A modeling analysis was performed to evaluate whether the EPA's final area or Arizona's recommended area should be prohibited from this General Permit. The results indicate that the use of Arizona's recommended area is more appropriate, mainly due to the fact that the impacts from crushing & screening plants are limited to near-source areas (less than 1 km).

2. Santa Cruz County $PM_{2.5}$ Non-Attainment Area

   The $PM_{2.5}$ exceedance in this area is mainly due to the emissions transported from Nogales, Sonora, Mexico, via nighttime drainage flows. Wood burning, food cooking, open burning, dust emissions, and tailpipe emissions from on-road and off-road vehicles on the Mexico side have been identified as the primary sources for $PM_{2.5}$. Since the exceedance caused by international transport of emissions is not controllable or preventable, this General Permit may be still applicable to the Santa Cruz County $PM_{2.5}$ non-attainment area. However, to protect the public health, operations in this area, the Permittee is required to comply with the Department's PM risk forecasts for the Nogales area..

3. Maricopa County

   Maricopa County is a $PM_{2.5}$ attainment area; however, the monitoring data indicate that the $PM_{2.5}$ concentrations in this area are significantly higher than other attainment areas. The background concentrations were determined based on the monitoring data collected from four monitors, including JLG Supersite, South

Phoenix, West Phoenix, and Mesa. The background concentration levels determined are about 65-70% of the NAAQS.

4. Other Attainment Areas

The background concentrations for other attainment areas were determined based on the monitoring data collected from six monitors across the state, including Flagstaff Middle School, Children's Park, Orange Grove, Apache Junction Fire Station, Casa Grande Downtown, and Prescott Valley. The background concentration levels determined are less than 50% of the NAAQS.

Table 14: Background Concentrations used in AERMOD Modeling Analysis

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)	Note
PM_{10}	24-hour	Attainment Areas: 26 Non-Attainment Areas: 58	Used in the General Permit for Concrete Batch Plant 2010. Refined background established in accordance with Appendix W of 40 CFR 51.
$PM_{2.5}$	24-hour	Pinal County $PM_{2.5}$ nonattainment area: 48 Nogales $PM_{2.5}$ nonattainment area: 40 Maricopa County: 23.3 Other areas: 14.6	Determined by averaging the 98th percentile 24-hour average concentrations over three years (2006-2008)
	Annual	Pinal County $PM_{2.5}$ nonattainment area: 22 Nogales $PM_{2.5}$ nonattainment area: 14 Maricopa County: 10.6 Other areas: 6.7	Determined by averaging the annual average concentrations over three years (2006-2008)
SO_2	Annual	5	Used in the General Permit for Concrete Batch Plant - 2010
	24-hour	50	
	3-hour	250	
NO_2	Annual	30	Used in the General Permit for Concrete Batch Plant - 2010
CO	8-hour	2,800	Used in the General Permit for Concrete Batch Plant - 2010
	1-hour	4,500	

G. Receptor Network

Receptors were spaced 25 meters along process area boundary (PAB) and 50 meters from PAB to 500 meters. Since the emission sources of a crushing & screening plant or a concrete batch plant are mainly ground level sources, the receptor network beginning at PAB and extending outward to 500 m is sufficiently large to identify the maximum impacts.

H. Modeled Scenarios

Table 15: Modeling scenarios for Crushing & Screening Plants

Facility	Modeling Scenario for Demonstrating the Compliance of NAAQS		Maximum Daily Operation	
	PM_{10} Attainment Area	**PM_{10} Nonattainment Area**	**PM_{10} Attainment Area**	**PM_{10} Nonattainment Area**
Crushing and screening plant (C&S) alone	500 tons/hour 13 hours/day A large generator rated 1000 horsepower	315 tons/hour 14 hours/day A large generator rated 1000 horsepower	6500 tons/day	4410 tons/day
Co-location of crushing and screening plant (C&S) and concrete batch plant (CBP)	<u>C&S:</u> 500 tons/hour 13 hours/day <u>CBP:</u> 1275 yd^3/day A large generator rated 1000 horsepower	<u>C&S:</u> 315 tons/hour 14 hours/day <u>CBP:</u> 1275 yd^3/day A large generator rated 1000 horsepower	<u>C&S:</u> 6500 tons/day <u>CBP:</u> 1275 yd^3/day	<u>C&S:</u> 4410 tons/day <u>CBP:</u> 1275 yd^3/day

I. Modeled Results

The modeled results for an individual crushing & screening plant are summarized in Table 16 for $PM_{10}/PM_{2.5}$ and Table 17 for gaseous pollutants, respectively. The modeled results for the co-location of a crushing & screening plant and a concrete batch plant are summarized in Table 18 for $PM_{10}/PM_{2.5}$ and Table 19 for gaseous pollutants, respectively. Representative background concentrations were added to modeled impacts and the total concentrations were then compared to the NAAQS. As shown in the tables, emissions from a crushing & screening plant and a collocated concrete batch plant will not cause or contribute to a violation of the NAAQS under the operational limits and conditions contained in the General Permit..

The AERMOD modeling analysis also revealed that the modeled impacts from crushing & screening plants were limited to near-field areas. All modeled maximum concentrations for all pollutants under varied meteorological conditions occurred in or near the process area boundary.

Table 16 Modeling Results of $PM_{2.5}$ and PM_{10} for Crushing & Screening Plant

Pollutant	Meteorological data sets	Modeled concentration ($\mu g/m^3$)[a]		Background concentration ($\mu g/m^3$)		Total concentration ($\mu g/m^3$)		NAAQS ($\mu g/m^3$)	
		24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
$PM_{2.5}$	Joseph City	15.5	4.6	14.6	6.7	30.1	11.3	35	15
	Flagstaff	12.0	4.6			26.6	11.3		
	Springerville	14.3	4.1			28.9	10.8		
	Kingman	12.0	3.7			26.6	10.4		
	Tucson	10.1	4.4			24.7	11.1		
	Gila Bend	14.0	4.1			28.6	10.8		
	Wintersburg	11.0	3.2			25.6	9.9		
	Rillito	9.6	4.0			24.2	10.7		
	Yuma	7.0	1.7			21.6	8.4		
	Phoenix	10.6	3.5	23.3	10.6	33.9	14.1		
Pollutant	Meteorological data sets	Modeled concentration ($\mu g/m^3$)[b] 24-hr		Background concentration ($\mu g/m^3$) 24-hr		Total concentration ($\mu g/m^3$) 24-hr		NAAQS ($\mu g/m^3$) 24-hr	
PM_{10}	Joseph City	119.3		26		145.3		150	
	Flagstaff	54.5				80.5			
	Springerville	101.8				127.8			
	Kingman	92.7				118.7			
	Tucson	73.7				99.7			
	Gila Bend	101.4				127.4			
	Wintersburg	81.6				107.6			
	Phoenix	83.2		58		141.2			
	Yuma	34.1				92.1			
	Rillito	67.2				125.2			

[a]*Per EPA's March 23, 2010 memorandum, "Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS", the highest average of the modeled annual averages across five years of National Weather Service (NWS) meteorological data or the highest modeled annual average for one year of site-specific meteorological data was used as the design value. The highest average of the maximum 24-hour averages across five years of NWS meteorological data or the highest modeled 24-hour average for one year of site specific meteorological data was used as the design value.*

[b]*Per 40 CFR Part 51, "…when n years are modeled, the (n+1)th highest concentration over the n-year period is the design value, since this represents an average or expected exceedance rate of one per year". For one-year Joseph city data, the H2H (highest second highest) value was used as the design concentration. For two-year Gila Bend data, the H3H (highest third highest) value was used as the design concentration. Since other meteorological data sets include five-year data, the H6H (highest sixth highest) value was used as the design concentration.*

Table 17: Modeling Results of NO2, SO2, and CO for Crushing & Screening Plant

Pollutant	Meteorological data sets	Modeled concentration (µg/m^3)			Background concentration (µg/m^3)			Total concentration (µg/m^3)			NAAQS (µg/m^3)		
		3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual
SO_2	Joseph City	0.284	0.128	0.011	250	50	5	250.3	50.1	5.01	1,300	365	80
	Flagstaff	0.353	0.224	0.065				250.4	50.2	5.07			
	Springerville	0.283	0.180	0.015				250.3	50.2	5.02			
	Kingman	0.298	0.150	0.026				250.3	50.2	5.03			
	Tucson	0.293	0.157	0.019				250.3	50.3	5.02			
	Gila Bend	0.290	0.117	0.014				250.4	50.1	5.01			
	Wintersburg	0.302	0.117	0.026				250.3	50.1	5.03			
	Phoenix	0.276	0.096	0.012				250.3	50.1	5.01			
	Yuma	0.280	0.128	0.020				250.3	50.1	5.02			
	Rillito	0.279	0.173	0.026				250.3	50.2	5.03			

Pollutant	Meteorological data sets	Modeled concentration (µg/m^3)		Background concentration (µg/m^3)		Total concentration (µg/m^3)		NAAQS (µg/m^3)	
		1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr
CO	Joseph City	259	106	4,500	2,800	4,759	2,906	40,000	10,000
	Flagstaff	165	135			4,665	2,935		
	Springerville	137	112			4,637	2,912		
	Kingman	142	109			4,642	2,909		
	Tucson	148	110			4,648	2,910		
	Gila Bend	145	82			4,645	2,882		
	Wintersburg	149	121			4,649	2,921		
	Phoenix	128	91			4,628	2,891		
	Yuma	145	116			4,645	2,916		
	Rillito	144	114			4,644	2,914		

Pollutant	Meteorological data sets	Modeled concentration (µg/m^3) Annual	Background concentration (µg/m^3) Annual	Total concentration (µg/m^3) Annual	NAAQS (µg/m^3) Annual
NO_2	Joseph City	8.9	30	38.9	100

	Flagstaff	52.2		82.2	
	Springerville	12.0		42.0	
	Kingman	20.8		50.8	
	Tucson	15.5		45.5	
	Gila Bend	11.1		41.1	
	Wintersburg	20.9		50.9	
	Phoenix	10.4		40.4	
	Yuma	17.0		47.0	
	Rillito	22.3		52.3	

Table 18 Modeling Results of $PM_{2.5}$ and PM_{10} for Collocation of Concrete Batch Plant and Crushing & Screening Plant

Pollutant	Meteorological data sets	Modeled concentration ($\mu g/m^3$)[a]		Background concentration ($\mu g/m^3$)		Total concentration ($\mu g/m^3$)		NAAQS ($\mu g/m^3$)	
		24-hr	Annual	24-hr	Annual	24-hr	Annual	24-hr	Annual
$PM_{2.5}$	Joseph City	16.6	4.8	14.6	6.7	31.2	11.5	35	15
	Flagstaff	9.5	3.7			24.1	10.4		
	Springerville	14.7	4.3			29.3	11.0		
	Kingman	12.1	3.3			26.7	10.0		
	Tucson	10.3	4.6			24.9	11.3		
	Gila Bend	14.6	5.0			29.2	11.7		
	Wintersburg	12.0	2.7			26.6	9.4		
	Rillito	9.8	4.4			24.4	11.1		
	Yuma	7.7	2.2			22.3	8.9		
	Phoenix	10.7	3.6	23.3	10.6	34.0	14.2		
Pollutant	Meteorological data sets	Modeled concentration ($\mu g/m^3$)[b] 24-hr		Background concentration ($\mu g/m^3$) 24-hr		Total concentration ($\mu g/m^3$) 24-hr		NAAQS ($\mu g/m^3$) 24-hr	
PM_{10}	Joseph City	120.7		26		146.7		150	
	Flagstaff	54.4				80.4			
	Springerville	108.8				134.8			
	Kingman	96.3				122.3			
	Tucson	76.1				102.1			
	Gila Bend	107.9				133.9			
	Wintersburg	85.1				111.1			
	Phoenix	83.7		58		141.7			
	Yuma	58.9				116.9			
	Rillito	72.6				130.6			

[a]Per EPA's March 23, 2010 memorandum, "Modeling Procedures for Demonstrating Compliance with PM2.5 NAAQS", the highest average of the modeled annual averages across five years of National Weather Service (NWS) meteorological data or the highest modeled annual average for one year of site-specific meteorological data was used as the design value. The highest average of the maximum 24-hour averages across five years of NWS meteorological data or the highest modeled 24-hour average for one year of site specific meteorological data was used as the design value.

[b]Per 40 CFR Part 51, "…when n years are modeled, the (n+1)th highest concentration over the n-year period is the design value, since this represents an average or expected exceedance rate of one per year". For one-year Joseph city data, the H2H (highest second highest) value was used as the design concentration. For two-year Gila Bend data, the H3H (highest third highest) value was used as the design concentration. Since other meteorological data sets include five-year data, the H6H (highest sixth highest) value was used as the design concentration.

Table 19 Modeling Results of NO_2, SO_2, and CO for Collocation of Concrete Batch Plant and Crushing & Screening Plant

Pollutant	Meteorological data sets	Modeled concentration (µg/m^3)			Background concentration (µg/m^3)			Total concentration (µg/m^3)			NAAQS (µg/m^3)		
		3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual	3-hr	24-hr	Annual
SO_2	Joseph City	0.343	0.079	0.012	250	50	5	250.3	50.1	5.01	1,300	365	80
	Flagstaff	0.351	0.181	0.057				250.4	50.2	5.06			
	Springerville	0.279	0.142	0.017				250.3	50.1	5.02			
	Kingman	0.286	0.158	0.025				250.3	50.2	5.03			
	Tucson	0.304	0.164	0.023				250.3	50.2	5.02			
	Gila Bend	0.255	0.129	0.016				250.3	50.1	5.02			
	Wintersburg	0.300	0.126	0.027				250.3	50.1	5.03			
	Phoenix	0.258	0.115	0.019				250.3	50.1	5.02			
	Yuma	0.298	0.132	0.022				250.3	50.1	5.02			
	Rillito	0.279	0.174	0.028				250.3	50.2	5.03			

Pollutant	Meteorological data sets	Modeled concentration (µg/m^3)		Background concentration (µg/m^3)		Total concentration (µg/m^3)		NAAQS (µg/m^3)	
		1-hr	8-hr	1-hr	8-hr	1-hr	8-hr	1-hr	8-hr
CO	Joseph City	274	86	4,500	2,800	4,774	2,886	40,000	10,000
	Flagstaff	168	139			4,668	2,939		
	Springerville	135	100			4,635	2,900		
	Kingman	139	107			4,639	2,907		
	Tucson	148	117			4,648	2,917		
	Gila Bend	139	77			4,639	2,877		
	Wintersburg	149	102			4,649	2,902		
	Phoenix	128	90			4,628	2,890		
	Yuma	150	116			4,650	2,916		
	Rillito	140	114			4,640	2,914		

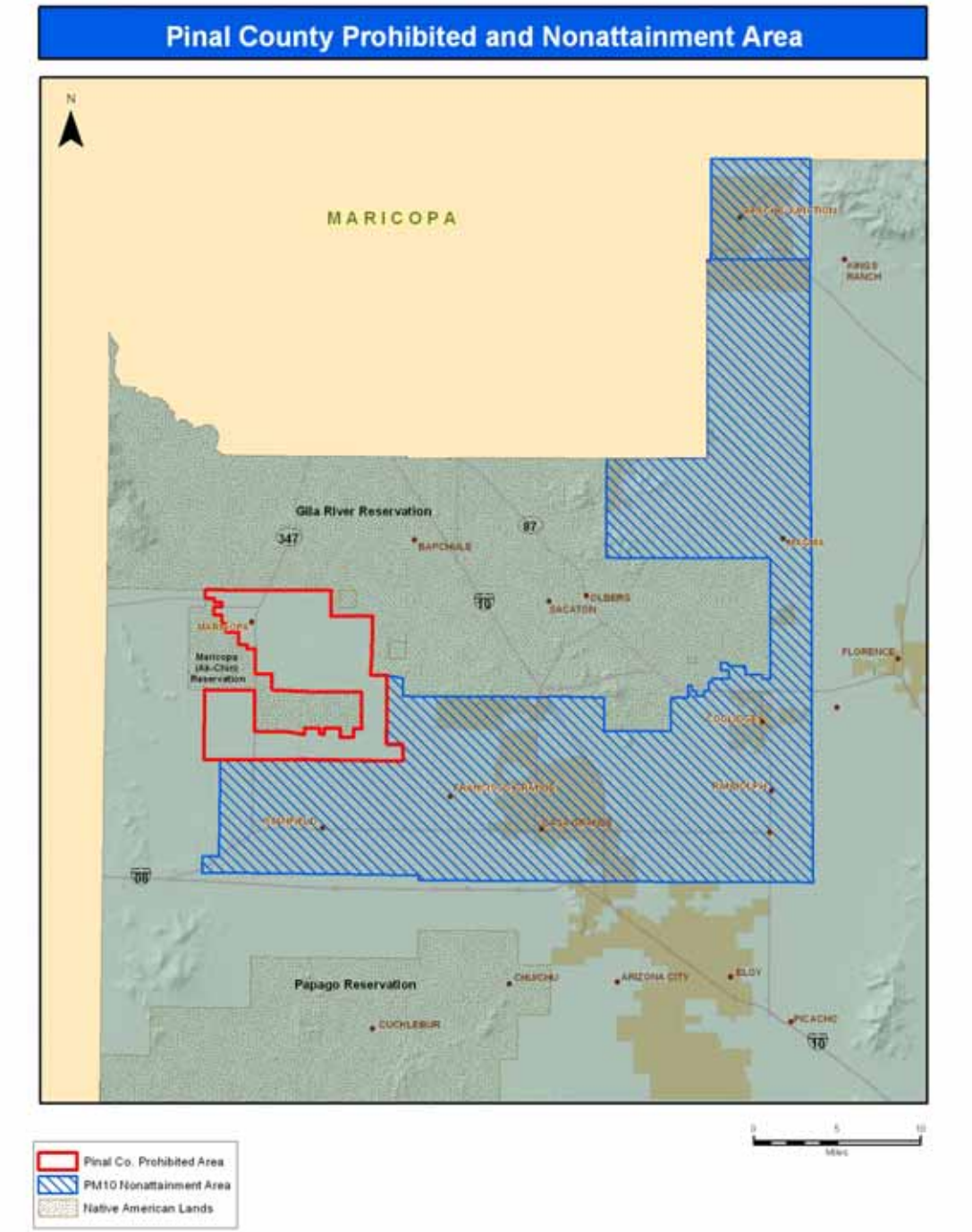
Pollutant	Meteorological data sets	Modeled concentration (µg/m^3) Annual	Background concentration (µg/m^3) Annual	Total concentration (µg/m^3) Annual	NAAQS (µg/m^3) Annual
NO_2	Joseph City	5.5	30	35.5	100
	Flagstaff	36.5		66.5	
	Springerville	10.2		40.2	

	Kingman	11.5		41.5	
	Tucson	15.8		45.8	
	Gila Bend	5.0		35.0	
	Wintersburg	10.2		40.2	
	Phoenix	10.7		40.7	
	Yuma	17.1		47.1	
	Rillito	22.5		52.5	

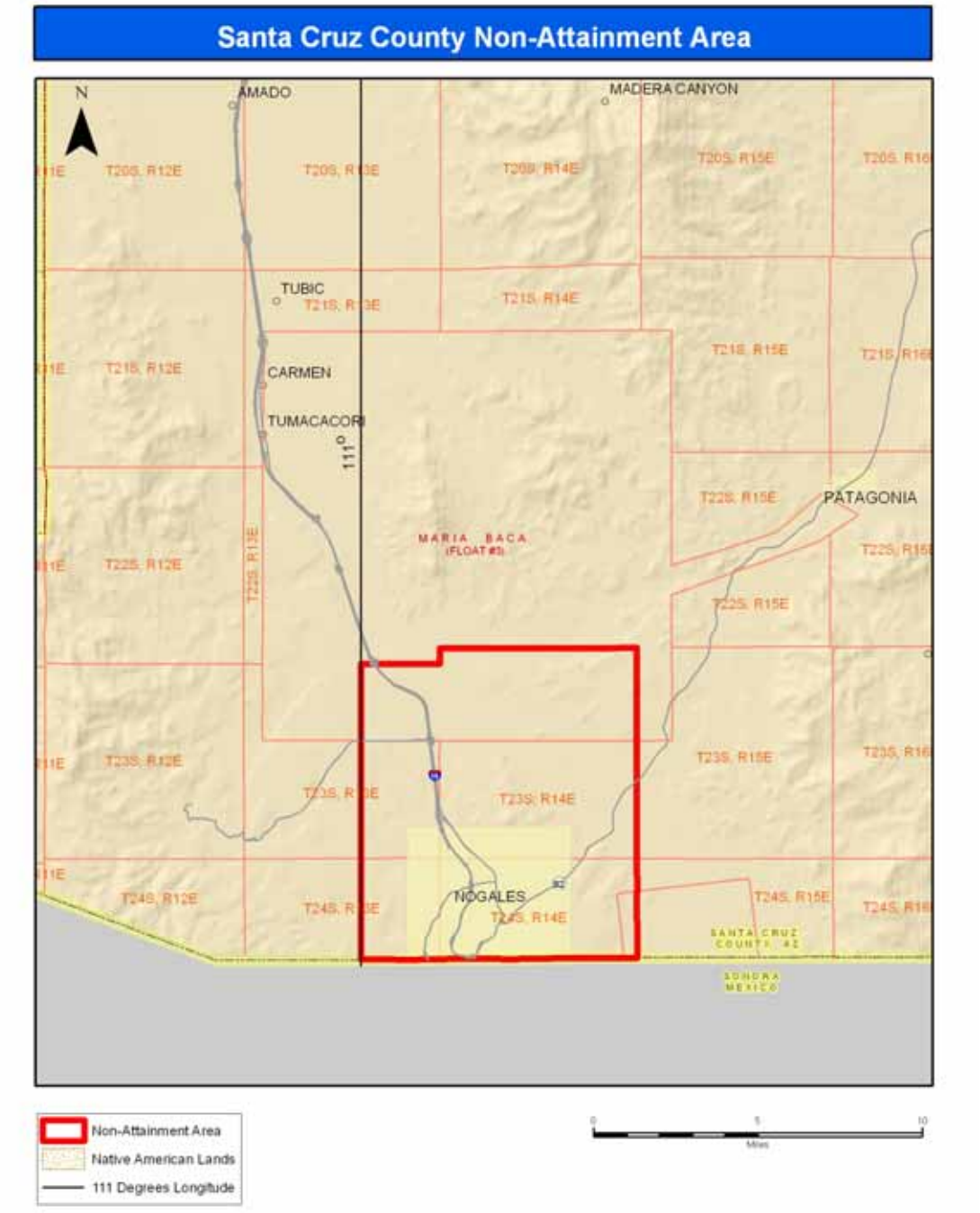
VI. LIST OF ABBREVIATIONS

A.A.C. ..... Arizona Administrative Code
ADEQ ..... Arizona Department of Environmental Quality
ATO ..... Authorization to Operate
BACT ..... Best Available Control Technology
C&S ..... Crushing and Screening
CBP ..... Concrete Batch Plant
CFR ..... Code of Federal Regulations
CO ..... Carbon Monoxide
EPA ..... Environmental Protection Agency
HAP ..... Hazardous Air Pollutant
MMBtu/hr ..... Million British Thermal Units per Cubic Foot
lb/hr ..... Pound per Hour
$\mu g/m^3$ ..... Microgram per Cubic Meter
NAAQS ..... National Ambient Air Quality Standards
NOV ..... Notice of Violation
NO_x ..... Nitrogen Oxides
NSPS ..... New Source Performance Standards
PAB ..... Process Area Boundary
PM ..... Particulate Matter
PM_{10} ..... Particulate Matter Nominally less than 10 Micrometers
$PM_{2.5}$ ..... Particulate Matter Nominally less than 2.5 Micrometers
PTE ..... Permanent Total Enclosure
SIP ..... State Implantation Plan
SO_2 ..... Sulfur Dioxide
VOC ..... Volatile Organic Compound

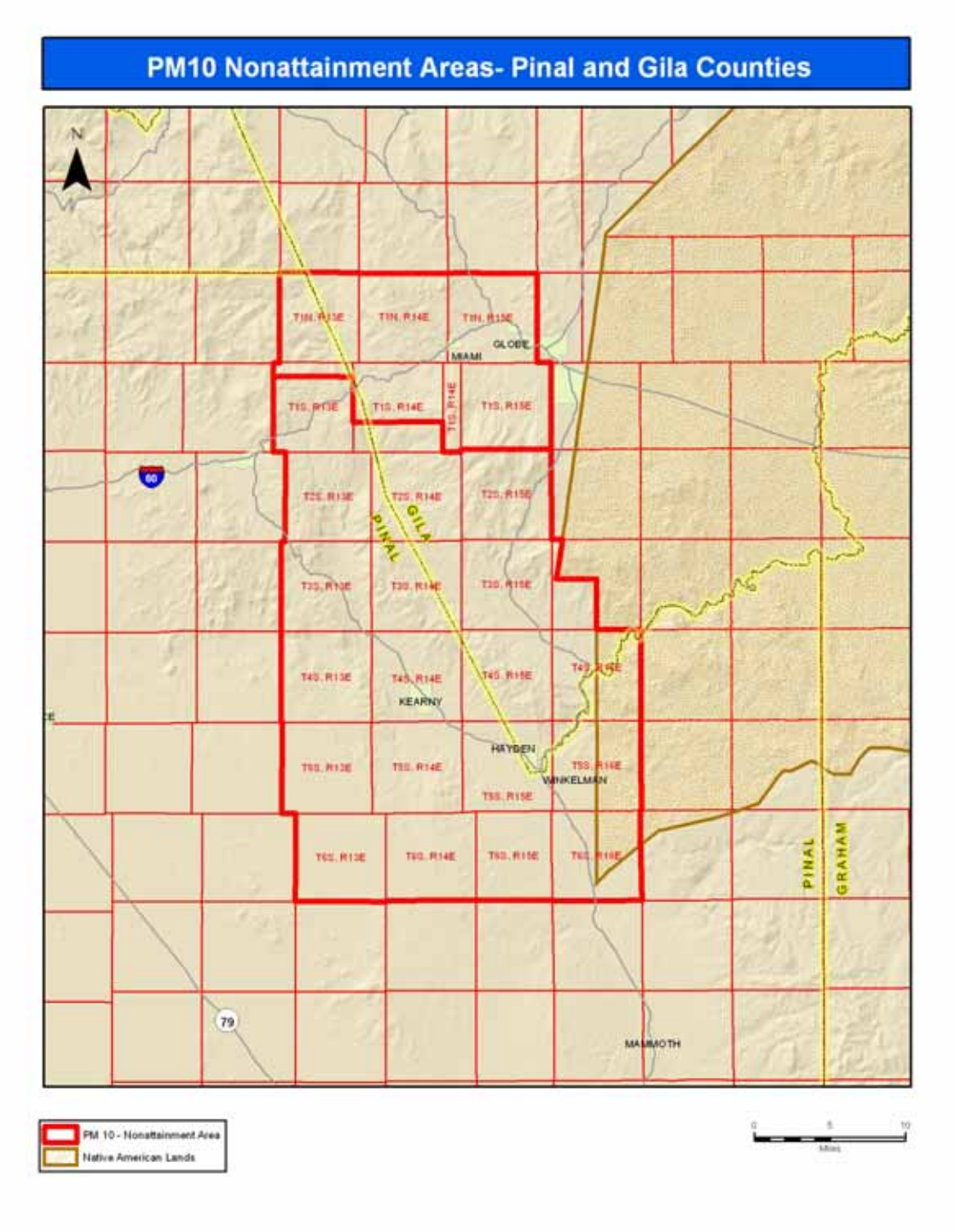
AIR QUALITY CONTROL GENERAL PERMIT FOR CRUSHING AND SCREENING PLANTS
APPENDIX "A"



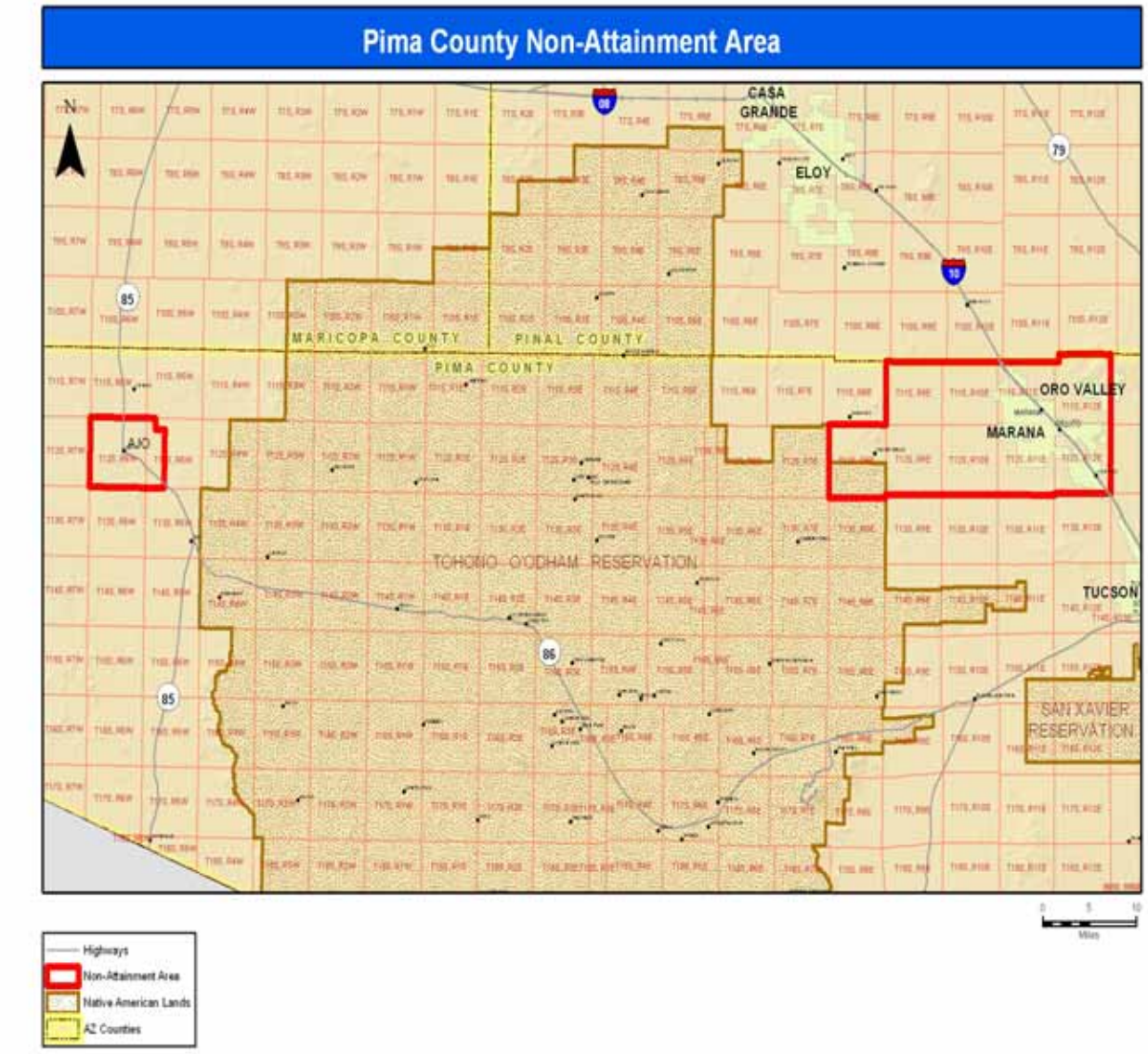
AIR QUALITY CONTROL GENERAL PERMIT FOR CRUSHING AND SCREENING PLANTS
APPENDIX "B"



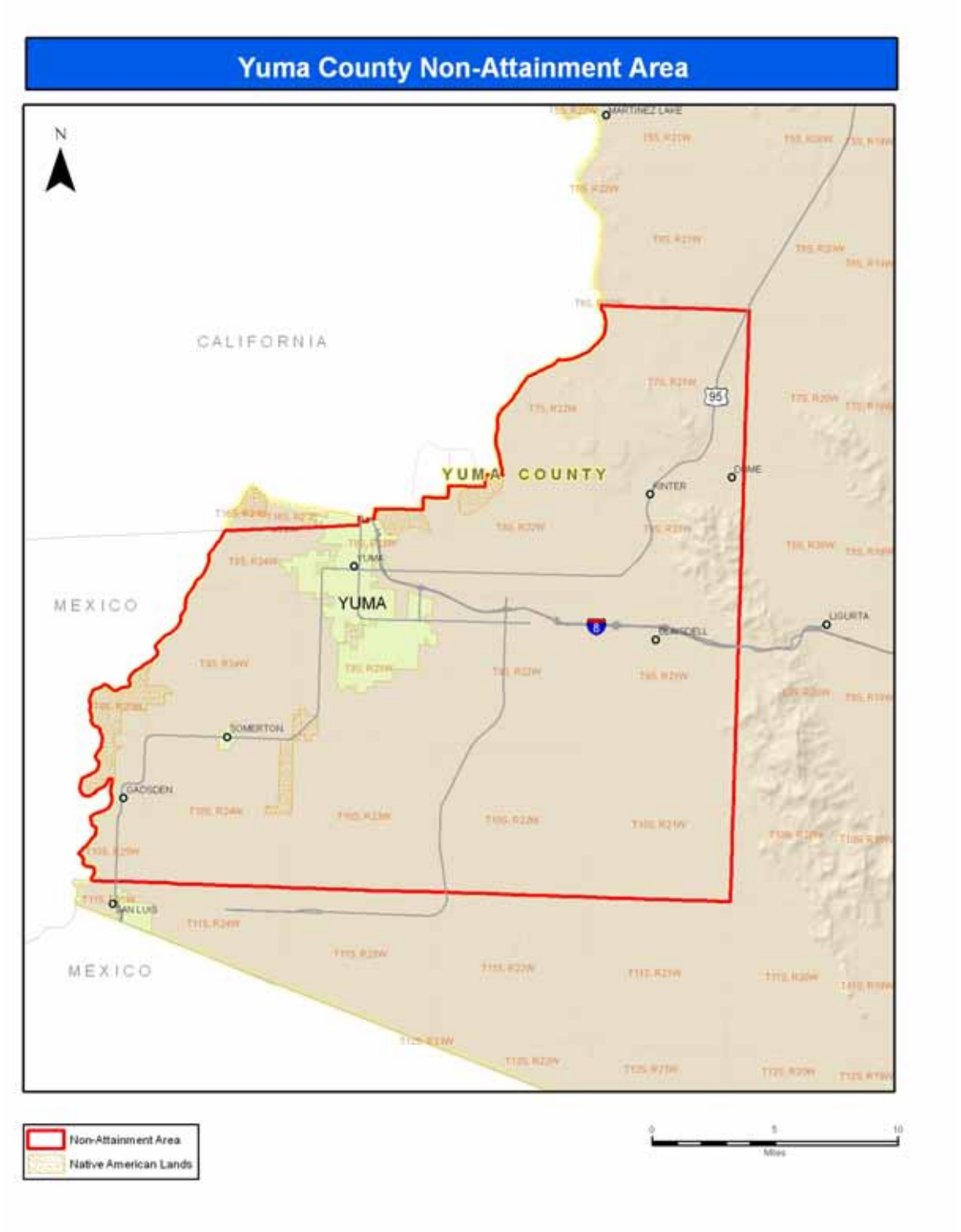
AIR QUALITY CONTROL GENERAL PERMIT FOR CRUSHING AND SCREENING PLANTS
APPENDIX "C"



AIR QUALITY CONTROL GENERAL PERMIT FOR CRUSHING AND SCREENING PLANTS
APPENDIX "D"



AIR QUALITY CONTROL GENERAL PERMIT FOR CRUSHING AND SCREENING PLANTS
APPENDIX "E"



AIR QUALITY CONTROL GENERAL PERMIT FOR CRUSHING AND SCREENING PLANTS
APPENDIX "F": MAP OF THE COCHISE COUNTY NON-ATTAINMENT AREA