DRAFT ENGINEERING EVALUATION

Plant No. 9029
Kie-Con Inc.
3551 Wilbur Avenue, Antioch, CA, 94509
Application No. 31805

Background

Kie-Con is applying for an Authority to Construct (A/C) for the following equipment:

S-23 Dual Compartment Cement Silo
Make: Erie Strayer, Model: CS2-500 Spilt Silo, 37 cubic yards per compartment
Compartment 1: 75 tons per day, 19,500 tons per year
Compartment 2: 75 tons per day, 19,500 tons per year
Total throughput: 150 tons per day, 39,000 tons per year

abated by

A-23 Baghouse for Compartment 1:
Make: C&W Dust Tech, Model: CP3335S Pulse Jet Dust Collector, Flow Rate: 3,335 SCFM

A-24 Baghouse for Compartment 2:
Make: C&W Dust Tech, Model: LPR-8-S Pulse Jet Dust Collector, Flow Rate: 2,340 SCFM

Kie-Con has proposed to install a stationary dual compartment cement silo (S-23), abated by two baghouses (A-23, and A-24) at 3551 Wilbur Avenue, Antioch, California. Kie-Con manufacturers large precast concrete items such as pilings, girders, and wall panels used in construction. The cement silo will be used to allow additional storage space of cement and cement supplement, to alleviate issues related to supply chain interruptions.

Emissions Summary

Kie-Con has provided proposed throughputs for S-23. The information provided was used to estimate particulate matter 10 microns in size (PM_{10}) and particulate matter 2.5 microns in size ($PM_{2.5}$). It is assumed that S-23 will not emit precursor organic compounds (POC), non-precursor organic compounds (NPOC), nitrogen oxides (NO_x), carbon monoxide (CO), and sulfur dioxide (SO_2).

The dual compartment cement silo consists of two compartments. Each compartment will dispense a maximum of 75 tons per day and 19,500 tons per year of cement and cement supplement. The total throughput will be a maximum of 150 tons per day and 39,000 tons per year of cement and cement supplement.

The following table summarizes the emission rate for the S-23.

Table 1. PM_{10} and $PM_{2.5}$ Dust Collector Emissions Review for S-1							
Compartment	**Pollutant[1]**	**Grain Loading[2] (grain/dscf)**	**Design Flowrate[3] (scfm)**	**Hourly Emission Rate (lbs./hour)**	**Daily Emission Rate[4] (lbs./day)**	**Annual Emission Rate[4] (lbs./year)**	**Annual Emission Rate[4] (tons/year)**
1	PM_{10}	0.0013	3335	0.04	0.9	326	0.163
	$PM_{2.5}$	0.0013	3335	0.04	0.9	326	0.163
2	PM_{10}	0.0013	2340	0.03	0.6	228	0.114
	$PM_{2.5}$	0.0013	2340	0.03	0.6	228	0.114
Total	PM_{10}			0.07	1.5	554	0.277
	$PM_{2.5}$			0.07	1.5	554	0.277

[1] It is assumed that $PM_{2.5}$ is equivalent to PM_{10}.

[2] The grain loading, will be based on Best Available Control Technology Guideline for concrete batch plants greater than or equal to 5 cubic yards per batch, Document 49.3, Revision 2, 07/27/2021. The permitted grain loading for the baghouse will be 0.0013 grain per dry standard cubic feet. Within the submittal, the facility proposed grain loading emission factors of 0.0004 and 0.0003 grains per dry standard cubic feet for each individual abatement device. However, the proposed grain loading emission factors do not seem measurable through source testing and would likely not be enforceable due to instrumentation limitations.

[3] The design flowrate was taken from the manufacturer specifications.

[4] The potential to emit was calculated assuming that the source operates 24 hours per day, 365 days per year.

In addition, road emissions from the facility will be estimated and included in the potential to emit (PTE) of S-23. Road emissions will be estimated using the paved surface emissions calculation methodology from AP-42, Section 13.2.2, since an aerial map view of the facility appears to show that the area surrounding the source is paved.

The following table summarizes the road dust emission rate pertinent to S-23.

Table 2. PM_{10} and $PM_{2.5}$ Emissions Review for Road Dust					
Pollutant	**Emission Factor (lbs./VMT)[1]**	**Hourly Emission Rate (lbs./hour)**	**Daily Emission Rate (lbs./day)**	**Annual Emission Rate (lbs./year)**	**Annual Emission Rate (tons/year)**
PM_{10}	0.85	0.09	0.3	103	0.052
$PM_{2.5}$	0.21	0.02	0.1	25	0.013

[1] From AP-42, 13.2.2: Paved Roads

PM_{10} emissions from paved surface traveling consists of the following:

a. Daily Truck traffic (incoming and outgoing – 3 total trucks from e-mail correspondence dated December 1st, 2022).
b. Hourly Truck Traffic (incoming and outgoing – 1 total truck from e-mail correspondence dated December 1st, 2022).
c. Miles traveled to S-23 and out of facility boundary is approximately 0.11 miles.

DRAFT

Paved surface emissions were calculated using the following equation from AP-42 Chapter 13.2.1.3 for particulate emissions due to vehicle travel on a dry paved road:

$$E = k\,(sL)^{0.91} \times (W)^{1.02}$$

Where E = PM_{10} emission factor, lb/vehicle miles traveled (VMT)
k = particle size multiplier, for PM_{10} k = 0.0022; for $PM_{2.5}$ k = 0.00054
sL = Silt Loading, using mean value for concrete batching from AP-42, Table 13.2.1-3 which is a value of 12 grams per meters squared.
W = Mean vehicle weight in tons which is reported to be 37.5 tons (average of incoming trucks and outgoing trucks loaded with concrete from an e-mail correspondence dared December 1st, 2022)

The following table summarizes the total emission rate, which includes emissions from operation and traffic, for S-23:

Table 3. Total PM_{10} and $PM_{2.5}$ Total Emissions Review

Pollutant	Hourly Emission Rate (lbs./hour)	Daily Emission Rate (lbs./day)	Annual Emission Rate (lbs./year)	Annual Emission Rate (tons/year)
PM_{10}	0.16	1.8	657	0.329
$PM_{2.5}$	0.09	1.6	579	0.290

The following table is a summary of the facility's cumulative increase.

Table 4. Plant Cumulative Emissions Increase

Pollutant	Existing Cumulative Increase Emissions, Post 4/5/91 (tons/year)	New Application Increase (tons/year)	New Cumulative Increase Emissions (tons/year)
POC	0.658	0.000	0.658
NO_x	2.220	0.000	2.220
PM_{10}	5.169	0.329	5.498
$PM_{2.5}$[1]	0.000	0.290	0.290
SO_2	0.072	0.000	0.072
CO	9.008	0.000	9.008

[1]For all pollutants except for $PM_{2.5}$, the cumulative increase is all permitted emissions that occur on or after April 5, 1991. For $PM_{2.5}$, the cumulative increase is all permitted emissions that occur on or after August 31, 2016.

DRAFT

Statement of Compliance

Regulation 1: General Provisions and Definitions

The facility is subject to Regulation 1, Section 301, which prohibits discharge of air contaminants resulting in public nuisance. The facility is expected to comply with this requirement.

Regulation 2, Rule 2: Permits – New Source Review

Best Available Control Technology: Per Regulation 2-2-301, Best Available Control Technology (BACT) is required for new or modified sources with highest day emissions of 10 pounds per day or more of POC, NPOC, NO_x, PM_{10}, $PM_{2.5}$, SO_2, and/or CO. S-23 does not have a BACT pollutant PTE equal to or greater than 10 pounds per highest day. Therefore, the source is not subject to BACT.

Emission Offsets:
Under Section 2-2-302, emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 10 tons per year or more of POC and NO_X. The facility will not have a PTE more than 10 tons per year of POC or NO_X. Therefore, the facility is not subject to the offset requirements of Regulation 2-2-302.

Under Section 2-2-303, emission offsets are required for new or modified sources at a facility which emits or will be permitted to emit 100 tons per year or more of $PM_{2.5}$, PM_{10}, and SO_2. The facility will not have a PTE more than 100 tons per year of $PM_{2.5}$, PM_{10}, and SO_2. Therefore, the facility is not subject to the offset requirements of Regulation 2-2-303.

Under Section 2-2-304 Federal Prevention of Significant Deterioration (PSD) , BACT is required for each PSD pollutant for which the net increase in emissions from the PSD Project will be significant as defined under Section 2-2-227. The facility is not subject to PSD permitting requirements under Regulation 2-2-304.

Regulation 2, Rule 5: Permits – New Source Review of Toxic Air Contaminants

The District's regulation for toxic air contaminant (TAC) emissions is codified in Regulation 2-5, New Source Review of Toxic Air Contaminants. Pursuant to Regulation 2-5-110, a project shall not be subject to this rule if, for each TAC, the total project emissions are below the acute and chronic triggers levels listed in Table 2-5-1 of this regulation. A project includes all related new or modified sources of TACs within a 5-year period. Kie-Con does not have any related project within the 5-year lookback period. Therefore, project emissions of TACs will only include the emissions summarized in Table 5.

Based on the trigger levels listed in Regulation 2-5, Table 2-5-1, the proposed TAC emissions from the project exceed the acute and chronic trigger levels for arsenic, hexavalent chromium, and nickel compounds. Therefore, this project is subject to the requirements of Regulation 2-5. In addition, this project is located within an overburdened community (OBC) as defined by Regulation 2-1-243 and will only be allowed an acceptable project cancer risk of 6.0 in a million.

DRAFT

Table 5. Regulation 2-5: Toxic Air Contaminant Review for Cement and Cement Supplement Silo Filling with Fabric Filter (S-23)								
Exhaust Points	**TAC Pollutants[1]**	**(CAS #)**	**Hourly Emission Rates (lbs./hour)[5]**	**Annual Emission Rate (lbs./year)**	**Acute Triggered Level (lbs./hour)**	**Exceeds Acute Trigger Level (Yes/No)**	**Chronic Trigger Level (lbs./year)**	**Exceeds Chronic Trigger Level (Yes/No)**
P-23 or P-24 for Cement	Arsenic	7440-38-2	3.2E-07	8.3E-05	8.8E-05	No	1.6E-03	No
	Beryllium	7440-41-7	3.6E-08	9.5E-06	--	N/A	3.4E-02	No
	Cadmium	7440-43-9	--	--	--	N/A	1.9E-02	No
	Chromium (VI)[2]	18540-29-9	1.9E-07	4.9E-05	--	N/A	5.1E-04	No
	Crystalline Silica[3]	7631-86-9	3.7E-03	3.3E+01	--	N/A	1.2E+02	No
	Lead	7439-92-1	8.2E-07	2.1E-04	--	N/A	2.9E-01	No
	Manganese	7439-96-5	8.8E-06	2.3E-03	--	N/A	3.5E+00	No
	Nickel	7440-02-0	3.1E-06	8.2E-04	8.8E-05	No	3.1E-01	No
	Selenium	7782-49-2	--	--	--	N/A	8.0E+00	No
P-23 or P-24 for Cement Supplement	Arsenic	7440-38-2	7.5E-05	2.0E-02	8.8E-05	No	1.6E-03	Yes
	Beryllium	7440-41-7	6.8E-06	1.8E-03	--	N/A	3.4E-02	No
	Cadmium	7440-43-9	1.5E-08	3.9E-06	--	N/A	1.9E-02	No
	Chromium (VI)[4]	18540-29-9	1.1E-05	2.7E-03	--	N/A	5.1E-04	Yes
	Crystalline Silica[3]	7631-86-9	3.7E-03	3.3E+01	--	N/A	1.2E+02	No
	Lead	7439-92-1	3.9E-05	1.0E-02	--	N/A	2.9E-01	No
	Manganese	7439-96-5	1.9E-05	5.0E-03	--	N/A	3.5E+00	No
	Nickel	7440-02-0	1.7E-04	4.4E-02	8.8E-05	Yes	3.1E-01	No
	Selenium	7782-49-2	5.4E-06	1.4E-03	--	N/A	8.0E+00	No
Road Dust	Crystalline Silica[3]	7631-86-9	9.4E-03	1.0E+01	--	No	1.2E+02	No
Total Project	Arsenic	7440-38-2	7.5E-05	2.0E-02	8.8E-05	No	1.6E-03	Yes
	Beryllium	7440-41-7	6.8E-06	1.8E-03	--	N/A	3.4E-02	No
	Cadmium	7440-43-9	1.5E-08	3.9E-06	--	N/A	1.9E-02	No
	Chromium (VI)	18540-29-9	1.1E-05	2.7E-03	--	N/A	5.1E-04	Yes
	Crystalline Silica[3]	7631-86-9	1.7E-02	7.6E+01	--	N/A	1.2E+02	No
	Lead	7439-92-1	4.0E-05	1.0E-02	--	N/A	2.90E-01	No
	Manganese	7439-96-5	2.8E-05	7.3E-03	--	N/A	3.5E+00	No
	Nickel	7440-02-0	1.7E-04	4.5E-02	8.8E-05	Yes	3.1E-01	No
	Selenium	7782-49-2	5.4E-06	1.4E-03	--	N/A	8.0E+00	No

DRAFT

[1] Emission factors are from AP-42, Table 11.12-8 for cement and cement supplement.

[2] Hexavalent Chromium for cement is derived from "*San Diego Air Pollution Control District, Concrete Batch Plant, February 2023"*. https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/mineral-products-industry-concrete-batch-plant/APCD-concrete.pdf. The cement dust for total chromium listed in the documentation is 58 parts per million weight and for Hexavalent Chromium is 5 parts per million weight . Using a ratio of 5 over 58 and multiplying this with EPAs AP-42, 11.12 Concrete Batch Plants value of total chromium reported factor, an emission factor is derived for hexavalent chromium.

[3]Crystalline silica is derived from "*San Diego Air Pollution Control District, C01- Concrete Batch Plant, Transit Mix Operation, Section 11.12 AP-42 (1/95), W/ Baghouse Controls, August 25, 1999*". https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/mineral-products-industry-concrete-batch-plant/APCD-Concrete-Batch-Plant-Transit-Mix-Operation.pdf. 10% of PM_{10} is assumed to be in the form of crystalline silica.

[4]Hexavalent Chromium for cement supplement is derived from "*San Diego Air Pollution Control District Concrete Batch Plant, February 2023*". https://www.sdapcd.org/content/dam/sdapcd/documents/permits/emissions-calculation/mineral-products-industry-concrete-batch-plant/APCD-concrete.pdf . The cement dust for total chromium listed in the documentation is 26 parts per million weight and for Hexavalent Chromium is 3 parts per million weight. Using a ratio of 3 over 26 and multiplying this with EPAs AP-42, 11.12 Concrete Batch Plants value of total chromium reported factor, an emission factor is derived for hexavalent chromium.

[5]The hourly emission rate is based on the facility's assumption that the daily throughput rate could occur in an hour of 75 tons per load, one hour loading time, and one load per day per compartment dated in an e-mail correspondence on August 17, 2022.

Results from an HRA performed indicate the project has a maximum cancer risk of 0.091 in a million (worker), a maximum chronic hazard index of 0.037 (worker), and an acute hazard index at point of maximum impact of 0.046 . Since the project is below a cancer risk of 6.0 in a million and a chronic hazard index of 1.0, the project risk is acceptable. The proposed new source does not require BACT for Toxics (TBACT) because the estimated source risk does not exceed a cancer risk of 1.0 in a million or a chronic hazard index of 0.20. S-23 meets the requirements of Regulation 2-5.

Regulation 6, Rule 1: Particulate Matter

Pursuant to Regulation 6-1-301, a person shall not emit from any source for a period or aggregate periods of more than three minutes in any hour, a visible emission that is as dark or darker than No. 1 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree.

Pursuant to Regulation 6-1-302, a person shall not emit from any source for a period or aggregate periods of more than three minutes in any hour an emission equal to or greater than 20% opacity.

Pursuant to Regulation 6-305, a person shall not cause annoyance to any other person where the particles are large enough to be visible as individual particles at the emission point, or of such size and nature as to be visible individually as incandescent particles.

Pursuant to Regulation 6-1-310.1, no person shall emit total suspended particulate (TSP) from any source in excess of 343 mg per dscm (0.15 grains per dry standard cubic feet). This source has two stacks, each abated by a control device that will be limited to 0.0013 grains per dry standard cubic feet.

Pursuant to Regulation 6-1-311.1, No person shall emit TSP from any source at a rate in excess of the limit indicated for the source's Process Weight Rate in Table 6-1-311.1. This source has two stacks, each abated by a control device that will be limited to 0.0013 grains per dry standard cubic feet. Assuming continuous operation, one-hour period results is 0.07 pounds per hour of TSP. The maximum TSP emission rate will be less than 1.78 pounds per hour from Table 6-1-311.1 of Regulation 6-1.

The source is expected to meet the requirements of this regulation.

Federal Regulations

There is no New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP) for this source category.

California Environmental Quality Act

Pursuant to Regulation 2-1-311, an application for a proposed new or modified source will be classified as ministerial and will accordingly be exempt from the California Environmental Quality Act (CEQA) requirement of Regulation 2-1-310 if the District's engineering evaluation and basis for approval or denial of the permit application for the project is limited to the criteria set forth in Regulation 2-1-428 and to the specific procedures, fixed standards, and objective measurements set forth in the District's Permit Handbook and BACT/TBACT Workbook. The evaluation of the proposed project was performed in accordance with comparable criteria set forth in Chapter 11.5 of the Permit Handbook and is considered ministerial.

Public Notice

The proposed source is located within an OBC as defined in Regulation 2-1-243 and requires a Health Risk Assessment pursuant to Regulation 2-5-401. Therefore, the proposed source is subject to the public notification requirements of Regulation 2-1-412. A public notice will be prepared and sent to all addresses within 1,000 feet of the proposed source and to parents and guardians of students within one-quarter mile of the source. There are no schools located within one-quarter mile of the source, therefore, the public notice will be sent to all addresses within 1,000 feet of the proposed source.

All comments received shall be summarized in final evaluation report.

Permit Conditions

Permit Condition # 27758 for S-23

1. The owner/operator shall process no more than the following material throughputs at the Dual Compartment Cement Silo, S-23:

   Cement: 75 tons per day; and
   19,500 tons in any consecutive 12 month period.

   Cement Supplement: 75 tons per day; and,
   19,500 tons in any consecutive 12 month period.

[Basis: Cumulative Increase]

2. The owner/operator shall route all particulate matter emissions from S-23 to Baghouse, A-23, and Baghouse, A-24, during all times of operation. [Basis: Cumulative Increase and Regulations 6-1-301, 6-1-310, and 6-1-311]

3. The owner/operator shall operate such that the outlet PM10, as defined in Regulation 2, Rule 1, grain loading for A-23 and A-24 does not exceed 0.0013 grains per dry standard cubic foot. [Basis: Cumulative Increase and Regulations 2-1-403, 6-1-301, 6-1-310, 6-1-311]

4. The owner/operator of A-23 shall not exceed the following maximum exhaust flowrates:

   A-23 3,335 standard dry cubic feet per minute
   A-24 2,340 standard dry cubic feet per minute
   [Basis: Cumulative Increase]

5. The owner/operator shall equip A-23 and A-24 with a device for measuring the pressure drop across each baghouse. The baghouses shall be checked for plugging at least every week. [Basis: Regulations 6-1-301, 6-1-310, 6-1-311, and 2-1-403]

6. The owner/operator shall inspect A-23 and A-24 weekly to ensure proper operation. The following items shall be checked:

   a. The pressure drop across the baghouses shall be checked weekly. The pressure drop shall be no lower than 0.5 inches of water and no greater than 6 inches of water.

   b. The baghouses exhaust shall be checked weekly for evidence of particulate breakthrough. If breakthrough is evident from plume observations, dust buildup near the stack outlet, or abnormal pressure drops, the filter bags shall be checked for any tears, holes, abrasions, and scuffs, and replaced as needed.

   c. All hoppers shall be discharged in a timely manner to maintain compliance with Part 6(a) above.

   d. The pulsejet, shaker cleaning system shall be maintained and operated at sufficient intervals to maintain compliance with Part 6(a) above. [Basis: Regulation 2-1-403]

7. No later than 60 days from the startup of S-23, A-23, and A-24, the owner/operator shall conduct District approved source tests to determine initial compliance with the limits in Parts 3 and 4. The owner/operator shall submit the source test results to the District’s Source Test Section no later than 60 days after the source test. [Basis: Regulation 2-1-403]

DRAFT

8. The owner/operator shall comply with all applicable testing requirements as specified in Volume IV of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section, in writing, of the source test protocols and projected test dates at least 7 days prior to testing.
[Basis: Regulation 2-1-403]

9. The owner/operator shall maintain the following records:

   a. Total cement and cement supplement throughputs on a daily basis;
   b. Daily throughput records totaled on a monthly basis;
   c. Monthly throughput records totaled on a rolling consecutive 12-month basis;
   d. Records of all inspections and all maintenance work including bag replacement for each baghouse. Records of each inspection shall consist of a log containing the date of inspection and the initials of the personnel that inspects the baghouses; and,
   e. Source test results and records required by Part 7 and 8 of this condition.

   All records shall be retained on-site for two (2) years, from the date of entry, and made available for inspection by District staff upon request.
   [Basis: Cumulative Increase]

End of Conditions

Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct for the equipment listed below. However, the proposed source will be located within an Overburdened Community and requires an HRA which triggers the public notification requirements of Regulation 2-1-412. After the comments are received from the public and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct and/or a Permit to Operate for the following equipment:

S-23 Dual Compartment Cement Silo
Make: Erie Strayer, Model: CS2-500 Spilt Silo, 37 cubic yards per compartment
Compartment 1: 75 tons per day, 19,500 tons per year.
Compartment 2: 75 tons per day, 19,500 tons per year.
Total throughput: 150 tons per day, 39,000 tons per year.

abated by

A-23 Baghouse for Compartment 1:
Make: C&W Dust Tech, Model: CP3335S Pulse Jet Dust Collector, Flow Rate: 3,335 SCFM

A-24 Baghouse for Compartment 2:
Make: C&W Dust Tech, Model: LPR-8-S Pulse Jet Dust Collector, Flow Rate: 2,340 SCFM

Osvaldo Zacarias 02/23/2023

Osvaldo Zacarias Date
Air Quality Engineer

DRAFT