01/27/2022

Attention: Compliance Manager
Ms. Hanna Valenzuela
Maricopa County Air Quality Department
301 W. Jefferson St., Suite 410
Phoenix, AZ 85003

Subject: Intel Ocotillo 2021 Annual Compliance Certification Report and Second Half (H2) 2021 Semi-Annual Monitoring Report

Dear Ms. Valenzuela,

Intel Corporation is submitting this 2021 Annual Compliance Certification Report and H2 2021 Semi-Annual Monitoring Report for the Intel Ocotillo Campus, located at 4500 South Dobson Road in Chandler, Arizona 85248. The Intel Ocotillo Campus operates under the Maricopa County Air Quality Title V Permit Number P0006742, Facility ID F000701 (Permit).

Annual Compliance Certification Reports and Semi-Annual Monitoring Reports are required by the Permit. The first half (H1) 2021 Semi-Annual Monitoring Report for the reporting period from 1/1/2021 to 6/30/2021 was submitted on 7/27/2021. Enclosed are the 2021 Annual Compliance Certification Report for the certification period from 1/1/2021 to 12/31/2021, and the H2 2021 Semi-Annual Monitoring Report for the reporting period from 7/1/2021 to 12/31/2021.

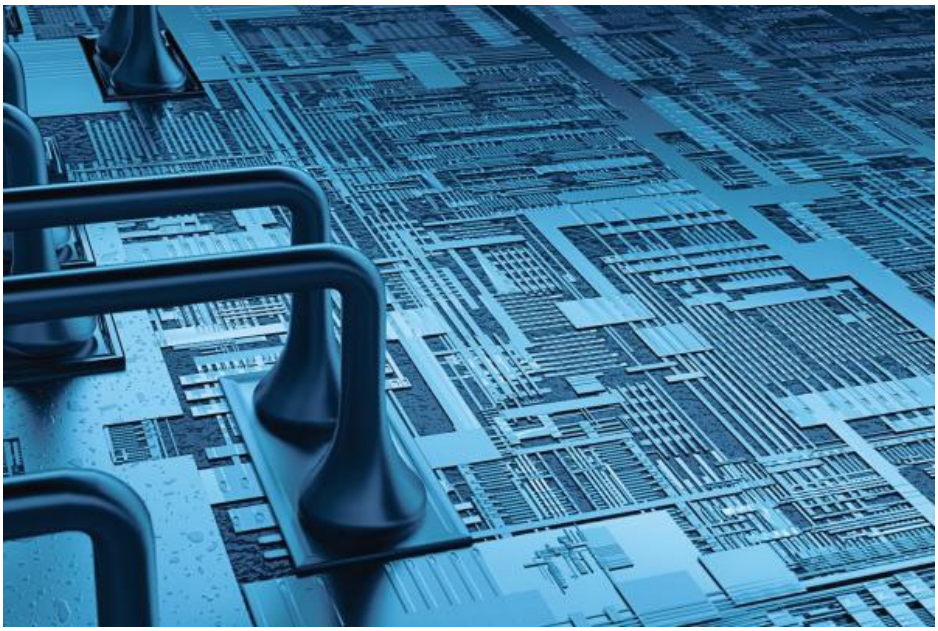
Please contact Sarah Cooper, Site Environmental Engineer, at 480-430-6265 or via email at sarah.cooper@intel.com if you have any questions. Please include the mailstop, OC4-005, on any postal correspondence.

Responsible Official Certification Statement: I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Sincerely,

Jim Evers
Vice President, Manufacturing and Operations
Factory Manager, Ocotillo Technology Fabrication

Enclosures:
1. Intel Corporation, Ocotillo Facility: 2021 Annual Compliance Certification Report
2. Intel Corporation, Ocotillo Facility: H2 2021 Semi-Annual Monitoring Report



Intel Corporation
Ocotillo Facility
2021 Annual Compliance Certification Report

MCAQD Title V Permit Number P0006742, Facility ID F000701
Submitted: January 2022

To:
Maricopa County Air Quality Department
301 W. Jefferson St., Suite 410
Phoenix, AZ 85003

Intel Corporation
4500 S. Dobson Road
Chandler, AZ 85248
1.480.554.8080
www.intel.com

1. Introduction

The Intel Ocotillo Facility (Ocotillo Facility) located at 4500 South Dobson Road in Chandler, Arizona 85248 operates under the Maricopa County Air Quality Title V Permit Number P0006742, Facility ID F000701 (Permit). In accordance with the requirements of the Permit, Intel Corporation has prepared this 2021 Annual Compliance Certification Report (Report) for the certification period from January 1, 2021 through December 31, 2021. The supporting first half (H1) and second half (H2) 2021 Semi-Annual Monitoring Reports have been submitted under separate cover. The H1 2021 Semi-Annual Compliance Report was submitted on July 27, 2021, and the H2 2021 Semi-Annual Compliance Report has been submitted along with this Report.

2. Annual Compliance Certification

The following table lists the conditions of the Permit and indicates the Ocotillo Facility's compliance status with each condition, whether compliance was continuous or intermittent over the certification period, and the method(s) used for determining the compliance status.

2021 Annual Compliance Certification Report

Identification of Permittee	Intel Corporation, 4500 South Dobson Road, Chandler, Arizona 85248 Permit #P0006742/ #P0006213/ #P0007815/ #P0008152, Facility ID F000701

The identification of each term or condition of the permit that is the basis of certification			Compliance Status	Compliance: Continuous or Intermittent?	The method(s) used for determining the compliance status of the source, currently and over the reporting period
Section	**Condition Number**	**Description**			**Task**
Specific Conditions	1	Allowable Source-Wide HAP Emissions Limitations	Compliant	Continuous	12 month rolling emissions calculations
	2	Plantwide Applicability Limits (PALs)	Compliant	Continuous	12 month rolling emissions calculations
	3	PAL General Requirements	Compliant	Continuous	Site Record Retention Program; Site PAL Monitoring Plan; Submitted Semi Annual Monitoring Report.
Semiconductor Manufacturing	4	Solvent Cleaning Stations	Compliant	Continuous	Site inspections; ESO (Equipment Sign Off) Program; Ventilation Program
	5	Solvent Storage and Disposal	Compliant	Continuous	Site inspections; Site waste disposal specifications; Site Hazardous Waste Program
	6	Semiconductor Systems	Compliant	Continuous	SCADA Data documentation of BSSW TO Function
	7	Control Requirements	Compliant	Continuous	Performance Testing; 12 month rolling emissions calculations; SCADA Data documentation of BSSW TO temperature and RCTO main header Negative Pressure; Maintain Site O&Ms; Daily rounds and readings to check RCTO oxidizer temperature
	8	Operations and Maintenance (O&M) Plans	Compliant	Intermittent	Follow site system specifications; Document completion of PMs in Maximo database; Training Program; Maintain and submit site O&M Plans; Daily rounds and readings to check RCTO oxidizer temperature; Daily rounds and readings to check Scrubber recirculation flow, pH, and differential pressure; SCADA Data documentation of BSSW TO temperature *Deviation reporting for the duration of intermittent compliance is provided in the H1 2021 Semi-Annual Monitoring Report.*
Emergency Engines	9	Operational Limitations - All Engines	Compliant	Continuous	Maintain Engine Run Hours; Corporate Self Assessment Program implemented by site
	10	Fuel Limitations - All Engines	Compliant	Continuous	Maintain Fuel certification; Corporate Self Assessment Program implemented by site
	11	Emissions Limitations/Standards - IIII	Compliant	Continuous	Maintain Fuel certification; Corporate Self Assessment Program implemented by site
	12	Operating Requirements - IIII	Compliant	Continuous	Maintain engine manufacturer specifications; Maintain engine EPA certifications; Maintain engine manufacturer O&M Manuals; Maintain PM Procedures based on Manufacturer's O&Ms; Document completion of PMs in Maximo database; Audit PM PAS (Performance Against Schedule); Corporate Self Assessment Program implemented by site
	13	Fuel Limitations - IIII	Compliant	Continuous	Maintain Fuel certification from supplier; Corporate Self Assessment Program implemented by site
	14	Monitoring - IIII	Compliant	Continuous	Maintain Non resettable meters; Corporate Self Assessment Program implemented by site
	15	General Compliance Requirements - ZZZZ	Compliant	Continuous	Maintain PM Procedures based on Manufacturer's O&Ms; Document completion of PMs in Maximo database; Corporate Self Assessment Program implemented by site
	16	Operating Requirements - ZZZZ	Compliant	Intermittent	Maintain PM Procedures based on Manufacturer's O&Ms; Document completion of PMs in Maximo database; Audit PM PAS (Performance Against Schedule); Corporate Self Assessment Program implemented by site *Deviation reporting for the duration of intermittent compliance is provided in the H2 2021 Semi-Annual Monitoring Report.*
	17	Work and Management Practices - ZZZZ	Compliant	Continuous	Maintain PM Procedures based on Manufacturer's O&Ms; Document completion of PMs in Maximo database; Corporate Self Assessment Program implemented by site
External Combustion Sources	18	Operational Limitations	Compliant	Continuous	Ensure Natural Gas Meters are installed on boilers, RCTOs, and TRMX systems; Corporate Self Assessment Program implemented by site
	19	Emission Limitations – Nitrogen Oxides and Carbon Monoxide	Compliant	Continuous	Performance Testing; Corporate Self Assessment Program implemented by site
	20	New Source Performance Standard (NSPS)	Not applicable	Not applicable	No new boilers started up during this certification period
Cooling Tower Operations	21	Operating Limitations	Compliant	Continuous	12 month rolling emissions calculations; Maintain Drift Eliminator Manufacturer Specifications; Review monthly TDS limits
Architectural Coating Operations	22	Operational Limitations / Standards	Compliant	Continuous	Site inspections; Site Contractor Chemical Approval Program; Corporate MREP Chemical Approval Program
Surface Coating Operations	23	Rule 336 Applicability	Compliant	Continuous	Site inspections; Site Contractor Chemical Approval Program
	24	40 CFR 63 Subpart HHHHHH Applicability	Not applicable	Not applicable	No 40 CFR 63 Subpart HHHHHH applicability during this certification period

2021 Annual Compliance Certification Report

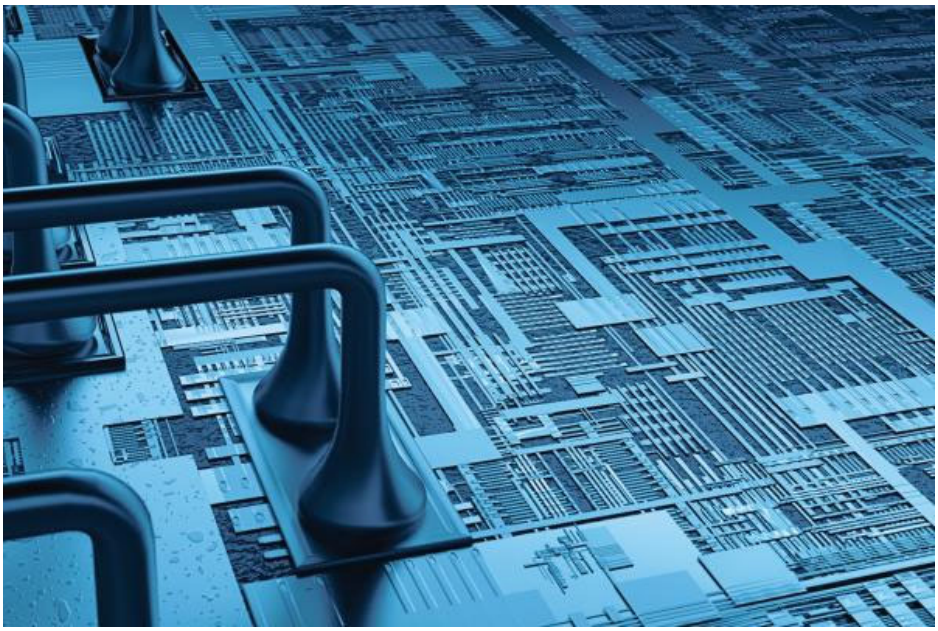
Identification of Permittee	Intel Corporation, 4500 South Dobson Road, Chandler, Arizona 85248 Permit #P0006742/ #P0006213/ #P0007815/ #P0008152, Facility ID F000701

The identification of each term or condition of the permit that is the basis of certification			**Compliance Status**	**Compliance: Continuous or Intermittent?**	**The method(s) used for determining the compliance status of the source, currently and over the reporting period**
Section	**Condition Number**	**Description**			**Task**
Storage Silos	25	Process Emission Limitations and Controls	Compliant	Continuous	Operational overflow warning system designed to alert and allow operator to stop loading operation installed on all lime silos; Properly sized baghouse designed to meet maximum outlet grain loading of 0.01 gr/dscf installed on all lime silos; Maintain maintenance records for baghouses
Industrial Wastewater (IWW) Plant	26	Standards	Compliant	Continuous	Odor Log; Site inspections; Site waste disposal specifications; Site Hazardous Waste Program
	27	Limitation - Hydrogen Sulfide (H_2S)	Compliant	Intermittent	Odor Log; Maintain compliance demonstration records *Deviation reporting for the duration of intermittent compliance is provided in the H2 2021 Semi-Annual Monitoring Report.*
Fugitive Dust From Dust Generating Operations	28	General Requirements for Dust Generating Operations	Compliant	Continuous	Multiple EHS employees maintain Rule 310 Comprehensive Certification; Daily Dust Inspections; Annual review site Dust Control Plan; Ad-hoc review and revision (if needed) of site Dust Control Plan prior to commencing new routine dust-generating operations
	29	Exemptions	Compliant	Continuous	Daily Dust Inspection
	30	Dust Control Plan Requirements	Compliant	Continuous	Site Dust Control Plan is kept onsite at all times; Annual review of site Dust Control Plan; Ad-hoc review and revision (if needed) of site Dust Control Plan prior to commencing new routine dust-generating operations; Daily Dust Inspections
	31	Visible Emission Requirements for Dust-Generating Operations	Compliant	Continuous	Daily Dust Inspection; Review of EPA Method 22
	32	Exemptions from Dust-Generating Operation Opacity Limitation Requirement	Compliant	Continuous	Daily Dust Inspection and corresponding Logs
	33	Stabilization Requirements for Dust-Generating Operations	Compliant	Continuous	Stabilization methods employed for each area are outlined in site Dust Control Plan; Daily Dust Inspection
	34	Soil Moisture	Compliant	Continuous	Daily Dust Inspection
	35	Dust Control Training Classes for Dust-Generating Operations	Compliant	Continuous	Maintain Dust Control training records for EHS and Drivers; Multiple EHS employees maintain Rule 310 Comprehensive Certification
	36	Dust Control Plan Revisions	Compliant	Continuous	Dust Control Plan revision submitted June 2021
	37	Records Retention	Compliant	Continuous	Daily Dust Inspection Logs
Site Wide Requirements	38	Opacity	Compliant	Continuous	Site inspections
	39	Record Keeping	Compliant	Continuous	Maintain the following onsite: Monthly Purchase Inventory Review; Annual Emission Factor Report submission to MCAQD; 12 month rolling emissions calculations; Maintain and follow site system specifications; Document completion of PMs in Maximo database; Training Program; Site O&M Plans maintenance and submission records; Maintain Site Rounds and Readings; Maintain Engine Run Hours; Maintain Engine Manufacturer Specifications; Maintain Engine Manufacturer O&M Manuals; Maintain PM Procedures based on Engine Manufacturer's O&Ms; Audit PM PAS (Performance Against Schedule); Monthly review of site Natural Gas Usage; Maintain site Odor Log; Maintain site BSSW TO temperature and RCTO Negative Pressure performance date from SCADA portal; Maintain daily dust inspection records; Maintain maintenance records for storage silo baghouses; Corporate Self Assessment Program implemented by site Results.
	40	Reporting	Compliant	Continuous	Submitted Quarterly Emissions Reports; Submitted Semi Annual Monitoring Report; Corporate Self Assessment Program implemented by site
	41	Performance Testing	Compliant	Continuous	Site Performance Testing Program; Site Self Assessment; Site Peer Review of documents submitted to MCAQD; Maintain MCAQD protocol and report approval letters
	42	Air Pollution Prohibited	Compliant	Continuous	Compliance to site Title V Air Permit allowable emissions conditions
	43	Circumvention	Compliant	Continuous	Annual Applicability Review; Site Technology Transfer Process; Site ESO (Equipment Sign Off) Program; Title V Compliance Certification Process; Corporate Self Assessment Program implemented by site; Corporate Audit Program
	44	Certification of Truth, Accuracy, and Completeness	Compliant	Continuous	Include certification in Semi-Annual Monitoring Report and Annual Certification Report

2021 Annual Compliance Certification Report

Identification of Permittee	Intel Corporation, 4500 South Dobson Road, Chandler, Arizona 85248 Permit #P0006742/ #P0006213/ #P0007815/ #P0008152, Facility ID F000701

The identification of each term or condition of the permit that is the basis of certification			**Compliance Status**	**Compliance: Continuous or Intermittent?**	**The method(s) used for determining the compliance status of the source, currently and over the reporting period**
Section	**Condition Number**	**Description**			**Task**
Site Wide Requirements (continued)	45	Compliance required	Compliant	Continuous	Annual Applicability Review; Title V Compliance Certification Process; Corporate Self Assessment Program implemented by site; Site inspections
	46	Confidentiality Claims	Compliant	Continuous	Specify as needed in reports submitted to MCAQD
	47	Contingent Requirements (Asbestos)	Compliant	Intermittent	EHS employee is certified AHERA Building Inspector; Site Disturbance of Material Form process; SIPP (Site Incident Prevention Process); Submitted demolition notifications to MCAQD; Corporate Self Assessment Program implemented by site; Corporate Audit Program; Site inspections; *Deviation reporting for the duration of intermittent compliance is provided in the H1 2021 Semi-Annual Monitoring Report*
		Contingent Requirements (RMP)	Compliant	Continuous	RMP submissions on file; Corporate Self Assessment Program implemented by site; Corporate Audit Program; Site inspections
		Contingent Requirements (Stratospheric Ozone Protection)	Compliant	Continuous	Site Refrigerant Program; Site refrigerant specifications; Corporate Self Assessment Program implemented by site; Corporate Audit Program; Site inspections
	48	Duty to Supplement or Correct Application	Compliant	Continuous	Follow documented peer review process for permit applications
	49	Emergency Episodes	Not applicable	Not applicable	No Emergency Episodes occurred during this certification period
	50	Emergency Provisions	Not applicable	Not applicable	No emergency occurred during this certification period resulting in exceedance of emission limits under this permit
	51	Excess Emissions	Not applicable	Not applicable	No excess emissions during this certification period
	52	Fees	Compliant	Continuous	MCAQD verified check was submitted and received for fees
	53	Modeling	Compliant	Continuous	Air quality modeling was performed as required for Intel's significant permit revision
	54	Monitoring and Testing	Compliant	Continuous	12 month rolling emissions calculations; Site Performance Testing Program
	55	Permits	Compliant	Continuous	Administrative permit revision completed successfully during this certification period; Site Self Assessment Programs; Title V Compliance Certification Process; Permit continuously posted onsite in bulletin board
	56	Recordkeeping	Compliant	Continuous	Site Record Retention Program
	57	Reporting	Compliant	Continuous	Annual Emissions Inventory submitted to MCAQD; Logged any deviations identified; Site Peer Review of documents that were submitted to MCAQD; Site Self Assessment Programs; Title V Compliance Certification Process
	58	Right to Entry and Inspection of Premises	Compliant	Continuous	MCAQD Annual Inspection occurred December 2021



Intel Corporation
Ocotillo Facility
H2 2021 Semi-Annual Monitoring Report

MCAQD Title V Permit Number P0006742, Facility ID F000701
Submitted: January 2022

To:
Maricopa County Air Quality Department
301 W. Jefferson St., Suite 410
Phoenix, AZ 85003

Intel Corporation
4500 S. Dobson Road
Chandler, AZ 85248
1.480.554.8080
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1. Introduction

The Intel Ocotillo Facility (Ocotillo Facility) located at 4500 South Dobson Road in Chandler, Arizona 85248 operates under the Maricopa County Air Quality Title V Permit Number P0006742, Facility ID F000701 (Permit). In accordance with the requirements of the Permit, Intel Corporation has prepared this second half (H2) 2021 Semi-Annual Monitoring Report (Report) for the reporting period from July 1, 2021 through December 31, 2021.

2. Emissions Calculations

Intel Corporation calculates and maintains a record of the Ocotillo Facility's rolling 12-month emissions as required by the Permit. The rolling 12-month emissions calculations for each month in this reporting period are provided below.

INTEL OCOTILLO EMISSION SUMMARY

12-Month Rolling Totals		Table 1: 12 Month Period for PAL Pollutants						PAL Limit
Pollutant	Units	Jul-2021	Aug-2021	Sep-2021	Oct-2021	Nov-2021	Dec-2021	
VOCs	Tons	95.91	96.29	98.86	101.89	103.97	105.83	175
NOx	Tons	123.53	128.16	132.25	136.26	139.40	143.40	198
CO	Tons	143.46	145.71	146.35	148.47	149.44	151.50	388
PM10	Tons	43.47	44.57	45.31	45.85	45.99	46.40	125
PM2.5	Tons	35.49	36.60	37.36	38.37	39.13	40.13	119
PM TOT	Tons	62.46	63.47	64.10	64.96	65.57	66.43	159
SO2	Tons	4.81	4.87	4.83	4.68	4.61	4.45	61
Fluorides	Tons	5.30	5.33	5.35	5.33	5.31	5.11	24

		Table 2: 12 Month Period for HAPs						Limit
HF	Tons	4.83	4.78	4.65	4.63	4.54	4.49	9
HAPs	Tons	8.07	8.06	7.94	7.99	7.94	7.93	22

Note: HF is the single largest HAP

3. Data Relied Upon for PAL Pollutant Emissions Calculations

The data relied upon to calculate the monthly and 12-month rolling PAL pollutant emissions during the reporting period are provided in Tables 3-1 through 3-23.

Intel Ocotillo Facility, Chandler AZ
H2 2021 Semi-Annual Monitoring Report
Reporting Period: 7/1/2021 – 12/31/2021
P0006742 Appendix B Section A. Emergency Engines and Fire Pumps: NOx, CO, PM, VOCs, and SO2

Table 3-1. NOx, CO, PM, PM10, PM2.5, VOC, SO2 Emission Factors for Emergency Generator Engines and Fire Pump Engines

ID	Emissions Unit	Fab	NOx	CO	PM/PM10/PM2.5	VOC	SO_2
			lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
F12-03-EGEN-1	3516 D1TA / #11147-01 (gen 1)	Fab 12	58.40	7.83	0.45	0.22	0.03
F12-03-EGEN-2	3516 D1TA / #11147-02 (gen 2)	Fab 12	58.40	7.83	0.45	0.22	0.03
F12-03-EGEN-3	3516 D1TA / #11147-03 (gen 3)	Fab 12	58.40	7.83	0.45	0.22	0.03
F12-03-EGEN-4	3516 D1TA / #11976 (gen 4)	Fab 12	58.40	7.83	0.45	0.22	0.03
F12-03-EGEN-5	3516 D1TA / #16894 (gen 5)	Fab 12	58.40	7.83	0.45	0.22	0.03
F12-ASH1-EGEN604-1A-01	3412C D1TA / #3FZ08267 (Litho)	Fab 12	12.22	0.30	0.56	0.07	0.01
F12-03-LSCGEN-1	F12 Litho Gen 1A 3516 - HD (Litho)	Fab 12	50.59	6.01	0.41	1.10	0.04
F12-03-LSCGEN-2	F12 Litho Gen 2A 3516 - HD (Litho)	Fab 12	50.59	6.01	0.41	1.10	0.04
F12-03-LSCGEN-3	F12 Litho Gen 3A 3516 - HD (Litho)	Fab 12	50.59	6.01	0.41	1.10	0.04
F22-10-CPS-GEN-1	3516 D1TA / 24Z09816 (CPS gen 1)	Fab 32S	58.40	7.83	0.45	0.22	0.03
F22-10-CPS-GEN-2	3516 D1TA / 24Z09825 (CPS gen 2)	Fab 32S	58.40	7.83	0.45	0.22	0.03
F22-10-CPS-GEN-3	3516 D1TA / 24Z09820 (CPS gen 3)	Fab 32S	58.40	7.83	0.45	0.22	0.03
F22-10-CPS-GEN-4	3516 D1TA / 24Z09814 (CPS Gen 4)	Fab 32S	58.40	7.83	0.45	0.22	0.03
F22-10-EGEN-1	DQKB / I000148784 (Gen 1 regular)	Fab 32S	45.09	5.80	0.67	1.29	0.04
F22-10-EGEN-2	DQKB / I000148786 (Gen 2 regular)	Fab 32S	45.09	5.80	0.67	1.29	0.04
F22-10-EGEN-3	DQKB / I000148785 (Gen 3 regular)	Fab 32S	45.09	5.80	0.67	1.29	0.04
F22-10-EGEN-4	DQKB / I000146278 (Gen 4 regular)	Fab 32S	45.09	5.80	0.67	1.29	0.04
F32-13-EGEN-1	DQKC / E060920878 (gen 1)	Fab 32	45.09	5.80	0.67	1.29	0.04
F32-13-EGEN-2	DQKC / E060920879 (gen 2)	Fab 32	45.09	5.80	0.67	1.29	0.04
F32-13-EGEN-3	DQKC / E060920877 (gen 3)	Fab 32	45.09	5.80	0.67	1.29	0.04
F32-13-EGEN-4	DQKAB / I080208703 (gen 4)	Fab 32	34.11	1.35	0.27	1.48	0.04
F32-09-LCSGEN-1	3516C D1TA / G5J00197	Fab 32	34.89	1.91	0.17	0.69	0.04
F32-09-LCSGEN-2	3516C D1TA / G5J00191	Fab 32	34.89	1.91	0.17	0.69	0.04
F22-EC2-LCSGEN-3	2000-XC6DT2 / New - Litho 3	Fab 32S	35.53	4.04	0.42	1.28	0.04
F22-EC2-LCSGEN-4	2000-XC6DT2 / New - Litho 4	Fab 32S	35.53	4.04	0.42	1.28	0.04
F42-BRW-GEN1	C15-D1TA BRW Tank	Fab 42	4.01	0.64	0.06	0.05	0.01
F42-17-EGEN-1A	DQLE-1 (1A)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-17-EGEN-1B	DQLE-2 (1B)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-1C	DQLE-3 (1C)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-17-EGEN-2A	DQLE-4 (2A)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-17-EGEN-2B	DQLE-5 (2B)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-2C	DQLE-6 (2C)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-3A	DQLE-7 (3A)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-3B	DQLE-8 (3B)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-3C	DQLE-9 (3C)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-1D	DQLE-10 (1D)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-2D	DQLE-11 (2D)	Fab 42	46.41	1.54	0.76	1.05	0.04
F42-GEN-3D	DQLE-12 (3D)	Fab 42	46.41	1.54	0.76	1.05	0.04
F12-CAP-X72AGENOCCA	DQCA CAP Water Engine	Fab 12	12.08	0.56	0.14	0.48	0.01
OW1-XWTG1X23A	C3000 D6e IWW (gen 1)	Fab 42/WATR	46.36	1.86	0.42	0.62	0.05
F12-FPHS-GEN-01	3306BT Fire Pump 1	Fab 12	8.53	1.84	0.61	0.68	0.56
F12-FPHS-GEN-02	3306BT Fire Pump 2	Fab 12	8.53	1.84	0.61	0.68	0.56

Notes:

PM emissions ≤ 2.5µm in size, therefore emission factors represent total PM, PM10, and PM2.5.

Intel Ocotillo Facility, Chandler AZ
H2 2021 Semi-Annual Monitoring Report
Reporting Period: 7/1/2021 – 12/31/2021
P0006742 Appendix B Section A. Emergency Engines and Fire Pumps: NOx, CO, PM, VOCs, and SO2

Table 3-2. Hours of Operation for Emergency Generator Engines and Fire Pump Engines

ID	Emissions Unit	Hours of Operation					
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
F12-03-EGEN-1	3516 D1TA / #11147-01 (gen 1)	0.0	0.6	0.6	0.2	1.4	0.0
F12-03-EGEN-2	3516 D1TA / #11147-02 (gen 2)	0.0	0.5	0.7	0.1	1.5	0.0
F12-03-EGEN-3	3516 D1TA / #11147-03 (gen 3)	0.0	0.5	0.7	0.0	1.6	0.0
F12-03-EGEN-4	3516 D1TA / #11976 (gen 4)	0.0	0.6	0.6	0.0	1.6	0.0
F12-03-EGEN-5	3516 D1TA / #16894 (gen 5)	0.0	1.0	0.0	0.0	2.0	0.0
F12-ASH1-EGEN604-1A-01	3412C D1TA / #3FZ08267 (Litho)	0.0	1.0	1.0	0.0	1.0	1.0
F12-03-LSCGEN-1	F12 Litho Gen 1A 3516 - HD (Litho)	0.0	0.7	0.6	0.0	1.2	0.0
F12-03-LSCGEN-2	F12 Litho Gen 2A 3516 - HD (Litho)	0.0	0.7	0.5	0.0	1.2	0.0
F12-03-LSCGEN-3	F12 Litho Gen 3A 3516 - HD (Litho)	0.0	0.7	0.5	0.0	1.3	0.0
F22-10-CPS-GEN-1	3516 D1TA / 24Z09816 (CPS gen 1)	1.1	0.4	0.0	1.0	0.2	0.0
F22-10-CPS-GEN-2	3516 D1TA / 24Z09825 (CPS gen 2)	0.6	0.0	1.4	0.4	0.2	0.0
F22-10-CPS-GEN-3	3516 D1TA / 24Z09820 (CPS gen 3)	0.5	0.0	0.6	1.0	0.2	0.0
F22-10-CPS-GEN-4	3516 D1TA / 24Z09814 (CPS Gen 4)	0.3	1.0	0.0	1.0	0.2	0.0
F22-10-EGEN-1	DQKB / I000148784 (Gen 1 regular)	0.1	0.8	0.6	0.7	0.0	0.0
F22-10-EGEN-2	DQKB / I000148786 (Gen 2 regular)	0.0	1.0	0.0	1.0	0.0	0.0
F22-10-EGEN-3	DQKB / I000148785 (Gen 3 regular)	1.0	0.0	1.0	0.0	0.0	0.0
F22-10-EGEN-4	DQKB / I000146278 (Gen 4 regular)	0.6	0.0	1.2	0.5	0.0	0.0
F32-13-EGEN-1	DQKC / E060920878 (gen 1)	0.0	1.0	1.0	0.0	0.0	0.0
F32-13-EGEN-2	DQKC / E060920879 (gen 2)	0.0	1.0	0.0	0.0	0.0	0.0
F32-13-EGEN-3	DQKC / E060920877 (gen 3)	0.0	1.0	1.0	0.0	0.0	0.0
F32-13-EGEN-4	DQKAB / I080208703 (gen 4)	1.0	2.0	0.0	0.0	0.0	0.0
F32-09-LCSGEN-1	3516C D1TA / G5J00197	0.5	0.3	0.9	0.0	0.0	0.0
F32-09-LCSGEN-2	3516C D1TA / G5J00191	0.0	0.4	0.7	0.0	0.0	0.0
F22-EC2-LCSGEN-3	2000-XC6DT2 / New - Litho 3	2.1	0.0	1.0	0.0	0.0	0.0
F22-EC2-LCSGEN-4	2000-XC6DT2 / New - Litho 4	1.9	0.5	0.5	0.0	0.0	0.0
F42-BRW-GEN1	C15-D1TA BRW Tank	0.7	0.9	0.6	2.9	0.0	0.0
F42-17-EGEN-1A	DQLE-1 (1A)	0.6	0.5	0.6	0.3	0.0	0.0
F42-17-EGEN-1B	DQLE-2 (1B)	0.5	0.0	0.6	0.0	0.6	0.0
F42-GEN-1C	DQLE-3 (1C)	0.6	0.0	1.1	0.0	0.7	0.0
F42-17-EGEN-2A	DQLE-4 (2A)	0.6	0.6	0.6	0.2	0.0	0.0
F42-17-EGEN-2B	DQLE-5 (2B)	0.5	0.4	0.8	0.0	0.5	0.0
F42-GEN-2C	DQLE-6 (2C)	0.6	0.5	0.6	0.0	0.7	0.0
F42-GEN-3A	DQLE-7 (3A)	0.6	0.6	0.5	0.0	0.8	0.0
F42-GEN-3B	DQLE-8 (3B)	0.3	0.6	0.5	0.0	0.8	0.0
F42-GEN-3C	DQLE-9 (3C)	0.6	0.6	0.5	0.0	0.8	0.0
F42-GEN-1D	DQLE-10 (1D)	0.6	0.0	1.1	0.0	0.6	0.0
F42-GEN-2D	DQLE-11 (2D)	0.0	0.0	1.7	0.0	0.6	0.0
F42-GEN-3D	DQLE-12 (3D)	0.0	0.0	1.7	0.0	0.5	0.0
F12-CAP-X72AGENOCCA	DQCA CAP Water Engine	1.2	0.9	0.7	0.0	1.4	0.0
OW1-XWTG1X23A	C3000 D6e IWW (gen 1)	0.0	0.0	0.0	0.0	0.0	0.7
F12-FPHS-GEN-01	3306BT Fire Pump 1	1.2	2.5	0.8	0.4	0.4	0.1
F12-FPHS-GEN-02	3306BT Fire Pump 2	1.8	3.9	4.1	4.2	7.7	1.6

P0006742 Appendix B Section B . Boilers: PM, SO2, and VOCs

Table 3-3. PM, PM10, PM2.5, VOC and SO2 Emission Factors for Boilers

ID	Boiler	Location of Emissions Unit	$PM/PM_{10}/PM_{2.5}$	VOC	SO_2
			lb/mmscf	lb/mmscf	lb/mmscf
BLR-32-GD3-1	F12 Boiler 1	Fab 12	7.60	5.50	0.60
BLR-32-GD3-2	F12 Boiler 2	Fab 12	7.60	5.50	0.60
BLR-32-GD3-3	F12 Boiler 3	Fab 12	7.60	5.50	0.60
BLR-32-GD3-4	F12 Boiler 4	Fab 12	7.60	5.50	0.60
BLR-115-1-210	F32S Boiler 1	Fab 32S	7.60	5.50	0.60
BLR-115-2-210	F32S Boiler 2	Fab 32S	7.60	5.50	0.60
BLR-115-3-210	F32S Boiler 3	Fab 32S	7.60	5.50	0.60
BLR-115-4-210	F32S Boiler 4	Fab 32S	7.60	5.50	0.60
BLR-115-5-210	F32S Boiler 5	Fab 32S	7.60	5.50	0.60
BLR-115-31-210	F32 Boiler 2	Fab 32	7.60	5.50	0.60
BLR-115-1-10	F42 Boiler 1	Fab 42	7.60	5.50	0.60
BLR-115-2-10	F42 Boiler 2	Fab 42	7.60	5.50	0.60
BLR-115-3-10	F42 Boiler 3	Fab 42	7.60	5.50	0.60
BLR-115-4-10	F42 Boiler 4	Fab 42	7.60	5.50	0.60

Notes:

PM emissions ≤ 2.5µm in size, therefore emission factors represent total PM, PM10, and PM2.5.

Table 3-4. Natural Gas Usage for Boilers

ID	Boiler	Natural Gas Usage (mmscf)					
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
BLR-32-GD3-1	F12 Boiler 1	0.18	8.45	0.24	3.14	12.13	1.19
BLR-32-GD3-2	F12 Boiler 2	19.35	9.70	20.85	21.25	15.38	7.40
BLR-32-GD3-3	F12 Boiler 3	6.52	7.75	7.58	12.78	8.96	22.07
BLR-32-GD3-4	F12 Boiler 4	0.17	0.08	0.16	7.05	10.07	22.72
BLR-115-1-210	F32S Boiler 1	5.33	5.36	5.08	6.68	6.99	9.10
BLR-115-2-210	F32S Boiler 2	5.88	5.81	5.96	7.81	7.95	10.25
BLR-115-3-210	F32S Boiler 3	0.00	0.00	0.00	0.00	0.00	0.00
BLR-115-4-210	F32S Boiler 4	0.05	0.04	0.66	5.12	7.27	2.77
BLR-115-5-210	F32S Boiler 5	0.00	0.00	0.00	0.22	0.29	0.45
BLR-115-31-210	F32 Boiler 2	0.00	0.00	0.00	0.00	0.00	0.00
BLR-115-1-10	F42 Boiler 1	0.01	0.01	0.02	0.02	1.33	2.64
BLR-115-2-10	F42 Boiler 2	0.02	0.02	0.03	0.02	0.02	0.02
BLR-115-3-10	F42 Boiler 3	0.02	0.02	3.07	4.57	1.24	2.75
BLR-115-4-10	F42 Boiler 4	1.78	1.76	0.38	0.01	1.33	0.31

P0006742 Appendix B Section C. Boilers: NOx and CO

Table 3-5. NOx and CO Emission Factors for Boilers

ID	Boiler	Location of Emissions Unit	NO_X	CO
			lb/mmscf	lb/mmscf
BLR-32-GD3-1	F12 Boiler 1	Fab 12	8.33	0.00
BLR-32-GD3-2	F12 Boiler 2	Fab 12	11.05	0.00
BLR-32-GD3-3	F12 Boiler 3	Fab 12	3.38	0.71
BLR-32-GD3-4	F12 Boiler 4	Fab 12	7.50	0.53
BLR-115-1-210	F32S Boiler 1	Fab 32S	5.88	0.43
BLR-115-2-210	F32S Boiler 2	Fab 32S	8.60	0.49
BLR-115-3-210	F32S Boiler 3	Fab 32S	7.90	0.57
BLR-115-4-210	F32S Boiler 4	Fab 32S	8.40	0.52
BLR-115-5-210	F32S Boiler 5	Fab 32S	6.50	0.20
BLR-115-31-210	F32 Boiler 2	Fab 32	11.00	4.90
BLR-115-1-10	F42 Boiler 1	Fab 42	12.46	0.06
BLR-115-2-10	F42 Boiler 2	Fab 42	8.87	0.07
BLR-115-3-10	F42 Boiler 3	Fab 42	8.87	0.07
BLR-115-4-10	F42 Boiler 4	Fab 42	8.87	0.07

Notes:

The Quality Assurance/Quality Control (QA/QC) data for the boiler emission factors are presented in the respective compliance test reports previously submitted to MCAQD. In an effort to keep this Semi-Annual Monitoring Report concise, that QA/QC data is not duplicated here.

P0006742 Appendix B Section D. General Fab Natural Gas Combustion Emissions: NOx, CO, PM, VOCs, and SO2

Table 3-6. NOx, CO, PM, PM10, PM2.5, VOC, and SO2 Emission Factors for General Fab Natural Gas Combustion Units

Emission Units	Location of Emissions Unit	NO_X	CO	$PM/PM_{10}/PM_{2.5}$	VOC	SO_2
		lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf	lb/mmscf
General Fab Natural Gas Combustion Units	Site-Wide	100.00	84.00	7.60	5.50	0.60

Notes:

PM emissions ≤ 2.5µm in size, therefore emission factors represent total PM, PM10, and PM2.5.

P0006742 Appendix B Section D. General Fab Natural Gas Combustion Emissions: NOx, CO, PM, VOCs, and SO2

Table 3-7. General Fab Natural Gas Usage

Emission Units	Natural Gas Usage in MMSCF					
	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
General Fab Natural Gas Combustion Units	38.64	39.94	37.54	38.52	40.65	50.78

Table 3-8. Cooling Tower Total Dissolved Solids (TDS) Concentrations

ID	Cooling Tower	TDS (ppm)					
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
F12-CT-29-GG5-(001 to 010)	F12	2530.81	2435.15	2486.45	2501.93	2311.92	2474.81
F22-OCC2-CT-114-(1 to 7)-210	F32S	3229.92	2830.82	2775.48	2804.24	2645.45	2820.03
F32-CT-114-(31 to 36)-210	F32	2356.69	2306.21	2402.37	2507.07	2367.86	1914.57
F42-BC1A-CT114-(1 to 14)-10	F42	2641.88	2498.28	2526.65	2542.20	2489.64	2564.84
N/A	MSB[1]	2154.39	2111.04	1854.56	1916.03	1064.09	1159.27

Notes:

All cooling towers operated 24 hours per day on each day of the reporting period.

1 - MSB cooling towers are categorized as insignificant activities, but are included here for completeness and consistency with previous reporting.

Table 3-9. VOC Chemical Usage Data in Cooling Towers

Cooling Tower	Cooling Tower Chemical Usage (lbs)					
	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Site	1.60	2.33	0.35	3.69	0.79	4.89

P0006742 Appendix B Section G. Storage Silos: PM

Table 3-10. PM, PM10, and PM2.5 Emission Factors for Silos

ID	Lime Silo	Fab	$PM/PM_{10}/PM_{2.5}$
			lb PM/ton of material
F12-TK266-1-40	F12 Lime Silos	Fab 12	0.0049
OC9-TK266-1-40	F32S Lime Silos	Fab 32S	0.0049
PWB2-TK266-1-40	F32 Lime Silos	Fab 32	0.0049
TBD	F42 Lime Silos	Fab 42	0.0049
TBD	IWW Sodium Bicarbonate Silo	Fab 42	0.0049

Notes:

PM emissions ≤ 2.5µm in size, therefore emission factors represent total PM, PM10, and PM2.5.

Table 3-11. Storage Silo Loading Frequency

ID	Storage Silo	Number of Silo Loads					
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
F12-TK266-1-40	F12 Lime Silos	1	2	2	1	3	2
OC9-TK266-1-40	F32S Lime Silos	4	3	4	2	2	4
PWB2-TK266-1-40	F32 Lime Silos	3	5	4	3	1	5
TBD	F42 Lime Silos	2	5	4	2	4	2
TBD	IWW Sodium Bicarbonate Silo	0	0	1	0	0	0

P0006742 Appendix B Section H. Monitoring Systems for Permitted Abatement Control Devices (Natural Gas Combustions Emissions Only): PM, VOCs and SO2

Table 3-12. PM, PM10, PM2.5, VOC, and SO2 Emission Factors for Control Devices

ID	Control Device	Location of Emissions Unit	$PM/PM_{10}/PM_{2.5}$	VOC	SO_2
			lb/mmscf	lb/mmscf	lb/mmscf
VOC-16-FK2-01	RCTO 1	Fab 12	7.60	5.50	0.60
VOC-16-FK2-02	RCTO 2	Fab 12	7.60	5.50	0.60
VOC-16-FM2-01	RCTO 3	Fab 12	7.60	5.50	0.60
VOC-16-FM2-02	RCTO 4	Fab 12	7.60	5.50	0.60
OCF1C-VOC-138-1-20	LCE RCTO 1	Fab 12	7.60	5.50	0.60
OCF1C-VOC-138-2-20	LCE RCTO 2	Fab 12	7.60	5.50	0.60
OCF1C-VOC-138-3-00	LCE RCTO 3	Fab 12	7.60	5.50	0.60
OCF1C-VOC-138-4-00	LCE RCTO 4	Fab 12	7.60	5.50	0.60
VOC-138-3-120	RCTO 3	Fab 32S	7.60	5.50	0.60
VOC-138-4-120	RCTO 4	Fab 32S	7.60	5.50	0.60
VOC-138-6-120	RCTO 5	Fab 32S	7.60	5.50	0.60
TBD	RCTO 6	Fab 32S	7.60	5.50	0.60
VOC-138-01-120	RCTO 1	Fab 32	7.60	5.50	0.60
VOC-138-02-120	RCTO 2	Fab 32	7.60	5.50	0.60
VOC-138-03-120	RCTO 3	Fab 32	7.60	5.50	0.60
OCF3B-VOC138-1-20	RCTO 4	Fab 32	7.60	5.50	0.60
OCF3B-VOC138-2-20	RCTO 5	Fab 32	7.60	5.50	0.60
TBD	RCTO 6	Fab 32	7.60	5.50	0.60
OCFS1A-VOC-138-1-00	FSB RCTO 1	Fab 42	7.60	5.50	0.60
OCFS1A-VOC-138-2-00	FSB RCTO 2	Fab 43	7.60	5.50	0.60
FB1A-VOC138-1-00	RCTO 1	Fab 44	7.60	5.50	0.60
FB1A-VOC138-2-00	RCTO 2	Fab 45	7.60	5.50	0.60
FB1A-VOC138-3-00	RCTO 3	Fab 46	7.60	5.50	0.60
OCFB1A-VOC-138-5-00	RCTO 5	Fab 47	7.60	5.50	0.60
PWB2-OX293-0-70	Trimix A Catalytic Oxidizer	Fab 32S/32	7.60	5.50	0.60
PWB2B-OX293-0-70	Trimix B Catalytic Oxidizer	Fab 32S/32	7.60	5.50	0.60
TBD	Trimix 1 Catalytic Oxidizer	Fab 42	7.60	5.50	0.60

Notes:

PM emissions ≤ 2.5µm in size, therefore emission factors represent total PM, PM10, and PM2.5.

Table 3-13. Natural Gas Usage for Control Devices

ID	Control Device	Fab	Natural Gas Usage (mmscf)					
			Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
VOC-16-FK2-01	RCTO 1	Fab 12	0.87	0.86	0.85	0.89	0.86	0.90
VOC-16-FK2-02	RCTO 2	Fab 12	0.64	0.65	0.66	0.70	0.70	0.77
VOC-16-FM2-01	RCTO 3	Fab 12	0.81	0.84	0.80	0.86	0.85	0.89
VOC-16-FM2-02	RCTO 4	Fab 12	0.99	0.97	0.96	1.01	1.02	1.12
OCF1C-VOC-138-1-20	LCE RCTO 1	Fab 12	1.08	1.42	0.71	0.00	0.00	0.00
OCF1C-VOC-138-2-20	LCE RCTO 2	Fab 12	1.50	1.46	1.03	0.00	0.00	0.00
OCF1C-VOC-138-3-00	LCE RCTO 3	Fab 12	0.00	0.00	0.00	1.41	1.30	1.39
OCF1C-VOC-138-4-00	LCE RCTO 4	Fab 12	0.00	0.00	0.00	1.84	1.77	1.88
VOC-138-3-120	RCTO 3	Fab 32S	0.82	0.83	0.84	0.87	0.87	0.92
VOC-138-4-120	RCTO 4	Fab 32S	0.92	0.92	0.92	0.96	0.92	0.95
VOC-138-6-120	RCTO 5	Fab 32S	0.64	0.65	0.61	0.63	0.67	0.64
TBD	RCTO 6	Fab 32S	0.26	0.35	0.40	0.38	0.43	0.39
VOC-138-01-120	RCTO 1	Fab 32	0.92	0.91	0.85	0.90	0.84	0.90
VOC-138-02-120	RCTO 2	Fab 32	0.82	0.82	0.74	0.80	0.75	0.79
VOC-138-03-120	RCTO 3	Fab 32	0.55	0.55	0.54	0.56	0.55	0.60
OCF3B-VOC138-1-20	RCTO 4	Fab 32	0.73	0.75	0.70	0.63	0.71	0.62
OCF3B-VOC138-2-20	RCTO 5	Fab 32	1.27	1.28	1.21	1.19	1.24	1.30
TBD	RCTO 6	Fab 32	0.00	0.00	0.00	0.00	1.52	0.61
OCFS1A-VOC-138-1-00	FSB RCTO 1	Fab 42	0.05	0.03	0.03	0.04	0.02	0.08
OCFS1A-VOC-138-2-00	FSB RCTO 2	Fab 42	0.34	0.37	0.35	0.38	0.37	0.36
FB1A-VOC138-1-00	RCTO 1	Fab 42	0.72	0.78	0.74	0.89	1.05	1.20
FB1A-VOC138-2-00	RCTO 2	Fab 42	0.82	0.93	0.92	1.30	1.43	1.48
FB1A-VOC138-3-00	RCTO 3	Fab 42	0.76	0.84	0.86	1.40	1.56	1.62
OCFB1A-VOC-138-5-00	RCTO 5	Fab 42	0.00	0.00	0.00	0.84	0.83	1.09
PWB2-OX293-0-70	Trimix A Catalytic Oxidizer	Fab 32S/32	0.61	0.63	0.57	0.66	0.66	0.64
PWB2B-OX293-0-70	Trimix B Catalytic Oxidizer	Fab 32S/32	0.59	0.65	0.60	0.62	0.60	0.61
TBD	Trimix 1 Catalytic Oxidizer	Fab 42	0.63	0.62	0.51	0.51	0.42	0.50

Intel Ocotillo Facility, Chandler AZ
H2 2021 Semi-Annual Monitoring Report
Reporting Period: 7/1/2021 – 12/31/2021
P0006742 Appendix B Section I. Monitoring Systems for Permitted Abatement Control Devices (Natural Gas Combustions Emissions Only): NOx and CO

Table 3-14. NOx and CO Emission Factors for Control Devices [1]

ID	Control Device	Fab	NO_x lbs/hr				CO lbs/hr			
			July	Aug-Sep	Oct	Nov -Dec	July	Aug-Sep	Oct	Nov -Dec
Multiple	RCTO Abatement Units	All	3.389	3.816	4.479	4.661	4.165	3.980	4.288	4.305
PWB2-OX293-0-70	Trimix A Catalytic Oxidizer	Fab 32S/32	0.14				0.27			
PWB2B-OX293-0-70	Trimix B Catalytic Oxidizer	Fab 32S/32	0.13				0.005			
TBD	Trimix 1 Catalytic Oxidizer[1]	Fab 42	0.96				0.014			

Notes:

The Quality Assurance/Quality Control (QA/QC) data for the control equipment emission factors are presented in the respective compliance test reports previously submitted to MCAQD. In an effort to keep this Semi-Annual Monitoring Report concise, that QA/QC data is not duplicated here.

1 - Emission factors for July calculations are based on performance testing conducted in 2020 for all fabs. All subsequent emission factors are based on performance testing conducted in 2020 for Fab 42, and 2021 for Fabs 12,22, and 32. RCTO NOx and CO emission factors updated in October to account for addition of F42 RCTO #5, and updated in December to account for addition of F32 RCTO #6. Emissions for added units are equal to the average of tested emissions of like units.

Table 3-15. Run Time for Control Devices

ID	Control Device	Fab	Run Time (hrs)					
			Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
VOC-16-FK2-01	RCTO 1	Fab 12	744	744	720	744	720	744
VOC-16-FK2-02	RCTO 2	Fab 12	744	744	720	744	720	744
VOC-16-FM2-01	RCTO 3	Fab 12	744	744	720	744	720	744
VOC-16-FM2-02	RCTO 4	Fab 12	744	744	720	744	720	744
OCF1C-VOC-138-1-20	LCE RCTO 1	Fab 12	744	744	720	0	0	0
OCF1C-VOC-138-2-20	LCE RCTO 2	Fab 12	744	744	720	0	0	0
OCF1C-VOC-138-3-00	LCE RCTO 3	Fab 12	0	0	0	744	720	744
OCF1C-VOC-138-4-00	LCE RCTO 4	Fab 12	0	0	0	744	720	744
VOC-138-3-120	RCTO 3	Fab 32S	744	744	720	744	720	744
VOC-138-4-120	RCTO 4	Fab 32S	744	744	720	744	720	744
VOC-138-6-120	RCTO 5	Fab 32S	744	744	720	744	720	744
TBD	RCTO 6	Fab 32S	744	744	720	744	720	744
VOC-138-01-120	RCTO 1	Fab 32	744	744	720	744	720	744
VOC-138-02-120	RCTO 2	Fab 32	744	744	720	744	720	744
VOC-138-03-120	RCTO 3	Fab 32	744	744	720	744	720	744
OCF3B-VOC138-1-20	RCTO 4	Fab 32	744	744	720	744	720	744
OCF3B-VOC138-2-20	RCTO 5	Fab 32	744	744	720	744	720	744
TBD	RCTO 6	Fab 32	0	0	0	0	720	744
OCFS1A-VOC-138-1-00	FSB RCTO 1	Fab 42	744	744	720	744	720	744
OCFS1A-VOC-138-2-00	FSB RCTO 2	Fab 42	744	744	720	744	720	744
FB1A-VOC138-1-00	RCTO 1	Fab 42	744	744	720	744	720	744
FB1A-VOC138-2-00	RCTO 2	Fab 42	744	744	720	744	720	744
FB1A-VOC138-3-00	RCTO 3	Fab 42	744	744	720	744	720	744
OCFB1A-VOC-138-5-00	RCTO 5	Fab 42	0	0	0	744	720	744
RCTO Total Operational Hours Per Month			**744**	**744**	**720**	**744**	**720**	**744**
PWB2-OX293-0-70	Trimix A Catalytic Oxidizer	Fab 32S/32	744	744	720	744	720	744
PWB2B-OX293-0-70	Trimix B Catalytic Oxidizer	Fab 32S/32	744	744	720	744	720	744
TBD	Trimix 1 Catalytic Oxidizer	Fab 42	744	744	720	744	720	744

Table 3-16. Site-Wide VOC Stack Testing Results and Monthly Production Index (PI)[1]

Stack Type	VOC Testing Result July	VOC Emission Factor for Aug-Sep Calculations	VOC Emission Factor for October Calculations	VOC Emission Factor for Nov-Dec Calculations	Jul-21 PI	Aug-21 PI	Sep-21 PI	Oct-21 PI	Nov-21 PI	Dec-21 PI
	lb/hr	lb/hr	lb/hr	lb/hr						
RCTO VOC Abatement Units	2.08	2.387	2.682	2.859	0.84	0.83	0.79	0.78	0.85	0.92
Wet Acid Scrubbers	2.692	2.438			0.84	0.83	0.79	0.78	0.85	0.92
Ammonia Scrubbers	2.765	5.3517			1.30	0.83	0.79	0.78	0.85	0.92

Notes:

The Quality Assurance/Quality Control (QA/QC) data for the process emission factors that were determined via performance testing are presented in the respective compliance test reports previously submitted to MCAQD. In an effort to keep this Semi-Annual Monitoring Report concise, that QA/QC data is not duplicated here.

PM emissions ≤ 2.5µm in size, therefore emission factors represent total PM, PM10, and PM2.5.

1 - Emission factors for July calculations are based on performance testing conducted in 2020 for all fabs. All subsequent emission factors are based on performance testing conducted in 2020 for Fab 42, and 2021 for Fabs 12,22, and 32. RCTO VOC emission factor updated in October to account for addition of F42 RCTO #5, and updated in November to account for addition of F32 RCTO #6. Emissions for additional units are equal to the average of tested emissions of like units.

P0006742 Appendix B Section K. Monitoring Systems for Fab Emission Units (Process Emissions Only): CO, NOx, PM, PM10, and PM2.5

Table 3-17. Site-Wide CO, NOx, PM, PM10, and PM2.5 Stack Testing Results and Monthly Production Index (PI) [1]

PAL Pollutant	Stack Type	Emission Factor for July Calculations	Emission Factor for Aug-Sep Calculations	Emission Factor for October Calculations	Emission Factor for Nov-Dec Calculations	Jul-21 PI	Aug-21 PI	Sep-21 PI	Oct-21 PI	Nov-21 PI	Dec-21 PI
		lb/hr	lb/hr	lb/hr	lb/hr						
CO	Wet Acid Scrubber	27.194	28.736			0.84	0.83	0.79	0.78	0.85	0.92
NOx	Wet Acid Scrubber	22.738	23.073			0.90	0.87	0.83	0.83	0.90	0.97
PM, PM10, PM2.5	Wet Acid Scrubber	6.225	6.841			0.84	0.83	0.79	0.78	0.85	0.92
PM, PM10, PM2.5	RCTO VOC Abatement	1.8433	1.6633	1.791	1.844	0.84	0.83	0.79	0.78	0.85	0.92

Notes:

The Quality Assurance/Quality Control (QA/QC) data for the process emission factors that were determined via performance testing are presented in the respective compliance test reports previously submitted to MCAQD. In an effort to keep this Semi-Annual Monitoring Report concise, that QA/QC data is not duplicated here.

PM emissions ≤ 2.5μm in size, therefore emission factors represent total PM, PM10, and PM2.5.

1 - Emission factors for July calculations are based on performance testing conducted in 2020 for all fabs. All subsequent emission factors are based on performance testing conducted in 2020 for Fab 42, and 2021 for Fabs 12,22, and 32. RCTO PM emission factor updated in October to account for addition of F42 RCTO #5, and updated in November to account for addition of F32 RCTO #6. Emissions for added units are equal to the average of tested emissions of like units.

Table 3-18. Emission Factors and Weighting Factors for SO2 Process Emissions and Monthly Chemical Usage

Compound[1]	Tech A	Tech B	Tech C	Tech A	Tech B	Tech C	Chemical Usage (Lbs)					
	Emission Factor lb/lb			Weighting Factor %			Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Chem 1	0.32	0.25	0.08	0.02	0.03	0.09	3762	3762	3198	3762	3610	3990
Chem 2	0.87	0.77	0.31	0.00	0.00	0.01	753.98	670.20	670.20	418.88	418.88	418.88

Notes:
1. These emission factors, by chemical, are based on actual tool testing from Intel's Research and Development facility in Oregon and would provide a competitor with specific trade secret recipe information to cause harm to Intel's competitive advantage if released to the public. This confidentiality claim meets the requirements of Arizona Revised Statute (ARS) §49-487 and Maricopa County Air Quality Department Rule 200 and Intel will submit a confidential list of these Emission Factors.

Table 3-19. Emission Factors and Weighting Factors for Fluoride Process Emissions and Monthly Chemical Usage

Compound[1]	Tech A	Tech B	Tech C	Tech A	Tech B	Tech C	Chemical Usage (Lbs)					
	Emission Factor			Weighting Factor								
	lb/lb			%			Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Chem 1	-	-	7.11E-02	1.00E-10	1.00E-10	9.40E-03	942.91	1018.32	600	640	822.91	902.91
Chem 2	6.50E-09	6.50E-09	1.30E-04	1.00E-10	1.09E-04	1.98E-03	529.11	388.01	0	0	246.92	317.47
Chem 3	1.67E-01	1.67E-01	1.42E-01	3.90E-03	1.07E-02	2.28E-02	1088	1088	952	1346.40	816	1224
Chem 4	2.06E-02	2.06E-02	8.92E-02	3.90E-03	1.07E-02	2.28E-02	1088	1088	952	1346.40	816	1224
Chem 5	-	0.00E+00	1.29E-03	1.79E-02	3.24E-02	9.35E-02	3762	3762	3197.70	3762	3610	3990
Chem 6	-	0.00E+00	0.00E+00	1.79E-02	3.24E-02	9.35E-02	3762	3762	3197.70	3762	3610	3990
Chem 7	1.58E-02	1.58E-02	2.81E-02	1.79E-02	3.24E-02	9.35E-02	3762	3762	3197.70	3762	3610	3990
Chem 8	3.72E-01	3.72E-01	1.39E-01	1.79E-02	3.24E-02	9.35E-02	3762	3762	3197.70	3762	3610	3990
Chem 9	-	0.00E+00	1.06E-04	1.00E-10	1.01E-03	1.84E-02	328.07	457.41	532.96	147.57	692.37	504.38
Chem 10	-	0.00E+00	0.00E+00	8.92E-04	3.72E-03	7.63E-03	584	550	375	550	550	475
Chem 11	6.48E-02	6.48E-02	1.34E-01	8.92E-04	3.72E-03	7.63E-03	584	550	375	550	550	475
Chem 12	6.41E-02	6.41E-02	3.12E-02	8.92E-04	3.72E-03	7.63E-03	584	550	375	550	550	475
Chem 13	3.86E-05	3.86E-05	6.17E-02	6.52E-04	6.31E-04	1.19E-03	250	150	300	250	100	200
Chem 14	2.33E-02	2.33E-02	4.09E-02	6.52E-04	6.31E-04	1.19E-03	250	150	300	250	100	200
Chem 15	1.33E-02	1.33E-02	7.43E-02	1.01E-03	8.93E-04	2.04E-03	240	120	192	132	180	156
Chem 16	2.63E-01	2.63E-01	1.17E-01	1.01E-03	8.93E-04	2.04E-03	240	120	192	132	180	156
Chem 17	-	0.00E+00	0.00E+00	1.08E-02	4.06E-02	6.32E-02	2775	2625	2400	2700	2400	2850
Chem 18	5.95E-02	5.95E-02	3.93E-02	1.08E-02	4.06E-02	6.32E-02	2775	2625	2400	2700	2400	2850
Chem 19	4.12E-02	4.12E-02	5.89E-02	1.08E-02	4.06E-02	6.32E-02	2775	2625	2400	2700	2400	2850
Chem 20	3.41E-02	3.41E-02	1.30E-01	2.92E-02	7.01E-02	2.50E-01	5643.83	6349.31	6349.31	5643.83	5643.83	7054.78
Chem 21	5.46E-02	5.46E-02	3.96E-02	2.92E-02	7.01E-02	2.50E-01	5643.83	6349.31	6349.31	5643.83	5643.83	7054.78
Chem 22	-	-	1.00E+00	1.00E-10	1.00E-10	9.24E-06	5.14	5.04	2.92	5.07	5.88	2.22
Chem 23	2.47E-01	2.47E-01	0.00E+00	2.82E-04	2.82E-04	1.10E-06	0	0	0	0	0	44
Chem 24	1.62E-02	1.62E-02	0.00E+00	2.82E-04	2.82E-04	1.10E-06	0	0	0	0	0	44
Chem 25	-	0.00E+00	6.73E-04	1.00E-10	7.59E+00	3.50E+00	46437.30	15479.10	0	0	0	0
Chem 26	-	0.00E+00	8.64E-01	1.30E-05	1.30E-05	1.98E-03	225.12	287.37	222.45	193.45	259.27	249.50
Chem 27	1.00E+00	1.00E+00	4.92E-03	1.30E-05	1.30E-05	1.98E-03	225.12	287.37	222.45	193.45	259.27	249.50
Chem 28	-	0.00E+00	5.27E-04	2.50E-01	3.45E-01	4.68E-01	18890	26400	17600	17600	26400	18030
Chem 29	1.27E-02	1.27E-02	1.69E-02	2.50E-01	3.45E-01	4.68E-01	18890	26400	17600	17600	26400	18030
Chem 30	5.45E-03	5.45E-03	5.53E-03	2.50E-01	3.45E-01	4.68E-01	18890	26400	17600	17600	26400	18030
Chem 31	-	0.00E+00	6.96E-02	1.00E-10	3.21E-04	9.14E-04	54.45	0.07	0.14	54.59	0	0.07
Chem 32	7.53E-01	7.53E-01	2.47E-01	1.00E-10	3.21E-04	9.14E-04	54.45	0.07	0.14	54.59	0	0.07
Chem 33	1.22E-03	1.22E-03	1.22E-03	1.00E-10	2.47E-02	3.99E-02	3640	3380	2470	2210	3250	2860
Chem 34	3.00E-05	3.00E-05	3.00E-05	1.00E-10	2.47E-02	3.99E-02	3640	3380	2470	2210	3250	2860
Chem 35	-	0.00E+00	0.00E+00	6.08E-02	1.60E-02	3.16E-02	4409.24	0	8818.48	0	4409.24	4409.24

Notes:
1. These emission factors, by chemical, are based on actual tool testing from Intel's Research and Development facility in Oregon and would provide a competitor with specific trade secret recipe information to cause harm to Intel's competitive advantage if released to the public. This confidentiality claim meets the requirements of Arizona Revised Statute (ARS) §49-487 and Maricopa County Air Quality Department Rule 200 and Intel will submit a confidential list of these Emission Factors.

Table 3-20. Tank Throughput Data

Tank ID	Tank Throughput (Gallons)					
	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
F12-TK-266-1-00	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000
F12-TK-266-1-01	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000
F12-TK-266-1-15	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000
F12-TK-266-1-60	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000
F12-TK-266-1-75	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000
F12-TK-266-1-90	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000
F12-TK-266-2-00	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000
F12-TK-266-2-15	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000	5,832,000
F12-TK-266-2-60	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000
F12-TK-266-2-75	6,480,000	6,480,000	6,480,000	6,480,000	6,480,000	6,480,000
F12-TK-76-GH1-1	36,798	35,863	32,152	29,376	29,176	30,882
F12-TK-76-GH1-2	36,798	35,863	32,152	29,376	29,176	30,882
F12-TK-76-GH4-1	36,798	35,863	32,152	29,376	29,176	30,882
F12-TK-76-GH4-2	36,798	35,863	32,152	29,376	29,176	30,882
F12-TK-76-GH6-1	146,316	141,367	131,883	152,868	150,006	158,809
F12-TK-79-GH10-1	73,158	70,683	65,942	76,434	75,003	79,404
F12-TK-79-GH10-2	73,158	70,683	65,942	76,434	75,003	79,404
F12-TK-79-GH10-3	146,316	141,367	131,883	152,868	150,006	158,809
F12-TK-79-GH1-1	0	1,237	0	1,224	0	1,246
F12-TK-79-GH1-2	0	1,237	0	1,224	0	1,246
F12-TK-79-GH4-1	0	1,237	0	1,224	0	1,246
F12-TK-79-GH4-2	0	1,237	0	1,224	0	1,246
F12-TK-79-GH7-1	73,158	70,683	65,942	76,434	75,003	79,404
F12-TK-79-GH7-2	73,158	70,683	65,942	76,434	75,003	79,404
F12-TK-80-GH1-1	1,234	0	598	310	290	975
F12-TK-80-GH1-2	0	0	0	0	0	0
F22-OCB2A-TK-269-1-00	73,596	71,726	64,303	58,751	58,352	61,765
F22-OCB2A-TK-269-1-30	73,596	71,726	64,303	58,751	58,352	61,765
F22-OCB2A-TK-270-1-00	146,316	141,367	131,883	152,868	150,006	158,809
F22-OCB2-TK-293-1-00	1,408,847	1,237,801	1,056,905	1,170,189	1,208,192	1,244,255
F22-OCB2-TK-293-2-00	1,408,847	1,237,801	1,056,905	1,170,189	1,208,192	1,244,255
F22-PWB2-TK-293-0-92	706,499	614,228	529,254	576,752	591,970	622,091
F22-PWB2-TK-293-1-15	686,187	593,220	505,488	554,580	571,897	597,642
F22-PWB2-TK-293-2-15	686,187	593,220	505,488	554,580	571,897	597,642
F22-PWB2-TK-293-3-15	686,187	593,220	505,488	554,580	571,897	597,642
F22-TK-251-1-200	1,476	571	361	1,200	1,313	267
F22-TK-296-1-05	0	0	1,901	0	926	0
F22-TK-296-1-15	0	0	4,940	0	2,405	0
F22-TK-296-2-05	0	0	1,901	0	926	0
F32-OCB2B-TK-269-1-00	73,596	71,726	64,303	58,751	58,352	61,765
F32-OCB2B-TK-270-1-00	146,316	141,367	131,883	152,868	150,006	158,809
F32-OCB2B-TK-286-1-50A	0	2,475	0	2,447	0	2,492
F32-PWB2B-TK-293-0-92	706,499	614,228	529,254	576,752	591,970	622,091
OC11-TK-266-1-00	6,480,000	6,480,000	6,480,000	6,480,000	6,480,000	6,480,000
OC11-TK-266-2-00	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000
OC9-TK-266-1-15	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000
OC9-TK-266-1-60	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000
OC9-TK-266-1-75	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000
OC9-TK-266-1-90	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000
OC9-TK-266-2-15	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000
OC9-TK-266-2-60	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000
OC9-TK-266-2-75	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000
OC9-TK-266-3-15	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000	10,800,000
OC9-TK-266-4-15	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000
OCPB1A-TK251-1-00	295	1,200	1,300	952	1,308	342
PWB2-TK-266-1-60	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000
PWB2-TK-266-1-75	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000
PWB2-TK-266-1-90	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000	4,320,000
PWB2-TK-266-2-60	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000
PWB2-TK-266-2-75	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000	2,592,000

P0006742 Appendix B Section N. Monitoring Systems for Fab Emission Units (Uncontrolled Evaporative Processes): Wipers, Sinks, and Bottles

Table 3-21. Solvent Usage for Wipers, Sinks, and Bottles

Evaporative Process Emission Source	Solvent Usage (Lbs)					
	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Bottles	419.30	524.12	899.61	524.97	419.30	209.65
Sinks	975.00	972.71	909.22	1015.01	937.77	826.54
Wipers	2149.85	1765.44	3720.24	2314.52	3720.24	3720.24

P0006742 Appendix B Section O. Monitoring Systems for Fab Emission Units (Uncontrolled Evaporative Processes): Chemical Delivery Modules

Table 3-22. Emission Factors for Chemical Delivery Modules

Chemical Delivery Module	Emission Factor (lb/lb)	Chemical Purchase Data (Lbs)					
		Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
LNDBA (Gen 3/4/5)	0.000302	180,050.41	175,433.74	161,583.71	152,350.35	160,044.81	152,350.35
PGMEA (Gen 3/4/5)	0.005756	158,732.64	142,859.38	124,596.30	133,370.69	128,308.88	126,986.11
POS F42 (Gen 5)	0.000074	673,920.00	566,200.00	565,760.00	515,443.50	564,340.00	565,460.00
POS Trio (Gen 3/4)	0.000062	201,415.11	225,497.35	172,954.28	157,957.61	155,439.92	140,114.86
IPA F42 (Gen 5)	0.003753	0.00	115,063.11	102,601.79	106,270.28	110,291.52	92,133.26
IPA Trio (Gen 3/4)	0.000499	271,436.73	345,189.33	307,805.37	318,810.84	329,793.56	276,399.79

Table 3-23. Emission Factors for Vehicular Traffic

Vehicular Traffic Area	$PM_{2.5}$ Emission Factor	PM_{10} Emission Factor	PM Emission Factor	Vehicle Miles Travelled					
	lb/vehicle mile travelled			Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21
Industrial Unpaved Roads	0.046	0.46	1.60	2149.85	2149.85	2080.50	2149.85	2080.50	2149.85
Paved Roads and Parking Lot Areas	0.00005	0.00	0.00	90197.60	90197.60	87288.00	114997.60	111288.00	114997.60
Paved Roads in Manufacturing Areas	0.00005	0.00	0.00	16733.06	17857.42	18055.83	20238.40	21463.95	23705.30

4. Emission Unit Additions and Changes to Monitoring Systems and Calculation Procedures

Emissions units that became operational during the reporting period are presented in the table below. No emissions units were modified during the reporting period.

Permit Equipment List S. No	Fab	Name	Identification	Notes
34	F12	LCE RCTO 3	OCF1C-VOC-138-3-00	Became operational in H2 2021
35	F12	LCE RCTO 4	OCF1C-VOC-138-4-00	Became operational in H2 2021
46	F32S	RCTO 6	OCF3B-VOC138-3-20	Became operational in H2 2021
50	F42	RCTO 4	OCFB1A-VOC138-5-00	Became operational in H2 2021
188	F42	IWW Sodium Bicarbonate Silo	TBD	Became operational in H2 2021

No updates to monitoring systems or emission calculation procedures occurred during the reporting period.

5. Deviation Reporting

Two deviations from the Permit requirements occurred during the reporting period and are described below.

Log Entry Date	Date of Identification	Permit and Permit Condition	Description	Cause	Corrective Actions	Preventative Measures
12/13/2021	12/13/2021	Permit Number P0006742, Condition 16.a	Annual maintenance on fire pumps 1 and 2 was not performed annually (1 year from anniversary date + 35 days) as specified in the permit. Annual maintenance in 2021 was performed 3/22/21, 1 year and 86 days after the previous annual maintenance event.	Process in place at the time of the deviation did not include verification of the required maintenance records and relied on Maximo and environmental tracking records only.	The job plan was updated to ensure maintenance is aligned with permit timeline requirements.	1. Maintenance work orders are now assigned to system owner and technician and are not to be closed out until service is done and paperwork is received. 2. These maintenance work orders are now identified as a compliance task in Maximo. 3. An additional vendor for contract work was identified. 4. The electrical department's best-known methods for engine annual maintenance scheduling and completion have been implemented. 5. Maintenance POs will now be generated, and payment verified by fire protection engineer to prevent service delays due to accounting issues. 6. Environmental reviewed and updated associated compliance tasks in environmental management system as necessary. 7. Retraining of technicians completed to notify them of these changes.
1/12/2022	1/12/2022	Permit Number P0006742, Condition 27.b.i.4.a	The annual H_2S compliance demonstration was not completed within the specified timeframe of 10-14 months from previous compliance demonstration. The annual compliance demonstration was due by 12/22/2021.	Process was not in place to trigger performance of annual H2S compliance demonstration.	The H_2S compliance demonstration was completed on 1/13/2022, and subsequently submitted to MCAQD via IMPACT.	1. Created a tracking spreadsheet of permit conditions and associated environmental management system (Portal) tasks to comply. 2. Created Portal task for annual H_2S compliance demonstration. 3. Added Global Air Program Self-Assessment to Title V semi-annual checklist and added a Portal task for completion.

6. Monitoring System Shutdowns

No monitoring system shutdowns occurred during the reporting period.