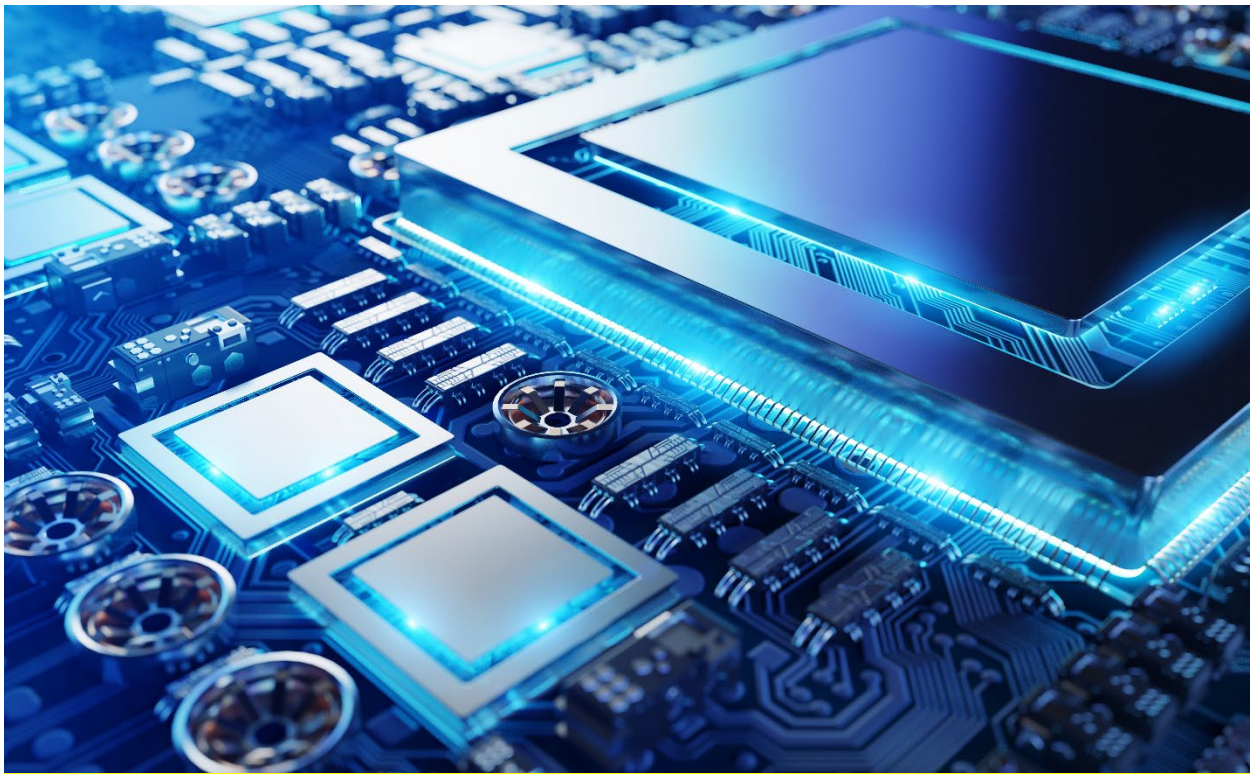

2023 H2 Semi-Annual Monitoring Report

MCAQD Title V Permit Number: P0010018
Facility ID: F000701
Date Submitted: January 29, 2024

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

Submitted By:
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Table of Contents

1. Introduction

Intel Corporation's (Intel) Ocotillo Facility (Facility ID F000701), located at 4500 South Dobson Road in Chandler, Arizona, operates under Title V Permit Number P0010018 (Permit) issued by Maricopa County Air Quality Department (MCAQD). Per Permit Conditions 3.h and 40.b., Semi-Annual Monitoring Reports are required to be submitted to within 30 days of the end of each reporting period. This Semi-Annual Monitoring Report is for the reporting period from July 1st, 2023 to December 31st, 2023 (H2 2023).

2. Rolling 12-Month Emissions

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

Table 1-1: 12 Month Rolling Totals for PAL Pollutants

PAL (tpy)	Pollutant	Units	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
198	NOx	tons	104.90	109.41	114.26	122.39	128.17	134.45
175	VOC	tons	65.46	65.64	68.00	71.62	74.30	76.32
388	CO	tons	139.36	149.65	160.23	175.65	187.75	200.42
125	PM10	tons	30.76	31.02	31.60	32.76	33.46	34.15
119	PM2.5	tons	23.80	24.07	24.66	25.83	26.53	27.20
159	PM	tons	54.24	54.49	55.00	56.08	56.83	57.58
61	SO2	tons	1.73	1.60	1.37	1.34	1.22	1.23
24	Fluorides	tons	6.81	7.13	7.23	7.69	7.88	8.27

Table 1-2: 12 Month Rolling Totals for HAPs

Limit (tpy)	Pollutant	Units	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
9	HCl	tons	2.04	2.25	2.44	2.72	2.94	3.17
22	Total HAPs	tons	6.33	6.58	6.78	7.19	7.22	7.45

Notes:
HCl 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 Attachment A.

4. Modifications or Additions to Emissions Units, Monitoring Systems, and Calculation Procedures

4.1. Emission Unit Modifications or Additions

No emissions units were added to the facility or modified during the reporting period.

The following equipment were in the process of being commissioned and generated start up emissions during this reporting period, but did not become fully operational:

- F52/F62 cooling towers (S. No. 180)
- F52/F62 boiler 1 (S. No. 19)
- F52/F62 boiler 2 (S. No. 20)
- F52/F62 boiler 3 (S. No. 21)

In accordance with Permit Condition 2.i, start-up emissions from the equipment above generated during the commissioning process were included in the Ocotillo Facility's monthly and 12 month rolling PAL pollutant emissions.

4.2. Monitoring System Updates

No monitoring system updates occurred during the reporting period.

4.3. Calculation Procedure Updates

No calculation procedure updates were made during the reporting period.

5. Deviation Reporting

One deviation from the Permit requirements occurred during the reporting period and is described below.

Table 5-1: Deviation Log

Deviation 1	**Log Entry Date**	7/20/2023
	Identification Date	7/20/2023
	Permit & Condition	Permit P0009659 Condition 30.a
	Description	A contractor's earthmoving operations began in the south retention basin on 7/14/2023 prior to the addition of the area to their existing Dust Control Permit.
	Cause	The contractor and its subcontractor did not follow established work procedures.
	Corrective Actions	The contractor modified their Dust Control Permit to include the south retention basin area, and MCAQD issued the revised Permit on 7/19/2023.
	Preventative Measures	Contractor implemented a weekly review of their work areas and comparison to their Dust Control Permit. Contractor's Dust Control Coordinator began attending the monthly logistics meeting in which all contractor Dust Control Permit areas are reviewed. Subcontractor's pre-task plan was modified to include a line item for verification of the Dust Control Permit's covered areas relative to the work location.

6. Monitoring System Shutdowns

Two temporary monitoring system shutdowns occurred during the reporting period. One monitoring system shutdown was related to a F22 RCTO unit (and was also reported in the H1 2023 Semi-Annual Monitoring Report), and the second was related to a HCl tank which serves the industrial wastewater plant. The details of each monitoring system shutdown are provided below.

On July 6, 2023, after collecting the monthly natural gas usage data, Intel identified that a failure of the natural gas flow indicating transmitter on F22 RCTO #5 occurred on June 8, 2023. Troubleshooting determined that the natural gas flow indicating transmitter failed due to a loose fuse holder. The issue was corrected, and the flow indicating transmitter was returned to normal operation on July 12, 2023. To prevent recurrence, the alarm status associated with out-of-range flow indicating transmitter readings for this RCTO (and other RCTOs in the system) were upgraded to "critical" so that a monitoring system shutdown of this nature can be more quickly identified and corrected.

The F22 RCTO #5 unit continued to operate while the flow indicating transmitter was down. In accordance with the requirements of Section H of Appendix B of Permit P0010018, Intel verified that unit operations remained within the specification limits as outlined in the applicable Operations and Maintenance Plan. Intel also utilized the alternative method specified in that same section of Permit P0010018 to approximate natural gas usage based on the modulating gas valve actuator position for the purpose of calculating SO_2 emissions.

In addition, the flow indicating transmitter to the HCl tank that serves the industrial wastewater plant (F42-WTR1-TK-932-1-01) began leaking in September 2023. Troubleshooting was performed which resulted in the flow indicating transmitted being removed and replaced with a blank spool piece until a replacement could be obtained and installed. Installation of the replacement flow indicating transmitter is currently scheduled for January 2024. This monitoring system shutdown caused a loss of throughput data for that specific tank. The tank continued to operate during the monitoring system shutdown. In accordance with the requirements of Section M of Appendix B of Permit P0010018, Intel used the most recent, and largest monthly throughput in the past 12 months, for emissions calculation purposes.

7. Responsible Official Certification

I certify, based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Zivit Katz-Tsameret	Vice President, Manufacturing, Supply Chain and Operations Factory Manager, Ocotillo Technology Fabrication
Printed Name	**Title**
Signature	1/26/24 **Date**

Attachment A
Data Relied Upon for PAL Pollutant Emissions Calculations

Section A. Emergency Engines and Fire Pumps: NOx, CO, PM, PM_{10}, $PM_{2.5}$, VOC, and SO_2 Emissions

Table 3-1. NOx, CO, PM, PM_{10}, $PM_{2.5}$, VOC, SO_2 Emission Factors for Emergency Generator Engines and Fire Pump Engines

Unit	Permit ID	NOx (lb/hr)	CO (lb/hr)	PM/PM_{10}/$PM_{2.5}$ [1] (lb/hr)	VOC (lb/hr)	SO_2 (lb/hr)
F12 EGEN 1	F12-03-EGEN-1	58.70	7.64	0.43	0.28	0.03
F12 EGEN 2	F12-03-EGEN-2	58.70	7.64	0.43	0.28	0.03
F12 EGEN 3	F12-03-EGEN-3	58.70	7.64	0.43	0.28	0.03
F12 EGEN 4	F12-03-EGEN-4	58.70	7.64	0.43	0.28	0.03
F12 EGEN 5	F12-03-EGEN-5	58.58	7.82	0.43	0.23	0.03
F12/32S Link EGEN 1	F12-ASH1-EGEN604-1A-01	12.22	0.30	0.56	0.07	0.01
F12 Litho Chiller Pad EGEN 2	F12-03-LSCGEN-1	50.59	6.01	0.41	1.10	0.04
F12 Litho Chiller Pad EGEN 3	F12-03-LSCGEN-2	50.59	6.01	0.41	1.10	0.04
F12 Litho Chiller Pad EGEN 4	F12-03-LSCGEN-3	50.59	6.01	0.41	1.10	0.04
F32S CPS EGEN 1	F22-10-CPS-GEN-1	32.86	6.02	1.14	0.45	0.02
F32S CPS EGEN 2	F22-10-CPS-GEN-2	32.86	6.02	1.14	0.45	0.02
F32S CPS EGEN 3	F22-10-CPS-GEN-3	32.86	6.02	1.14	0.45	0.02
F32S CPS EGEN 4	F22-10-CPS-GEN-4	32.86	6.02	1.14	0.45	0.02
F32S EGEN 1	F22-10-EGEN-1	45.09	5.80	0.64	1.29	3.74
F32S EGEN 2	F22-10-EGEN-2	45.09	5.80	0.64	1.29	3.74
F32S EGEN 3	F22-10-EGEN-3	45.09	5.80	0.64	1.29	3.74
F32S EGEN 4	F22-10-EGEN-4	45.09	5.80	0.64	1.29	3.74
F32 Litho EGEN 1	F32-09-LCSGEN-1	34.89	1.91	0.17	0.69	0.04
F32 Litho EGEN 2	F32-09-LCSGEN-2	34.89	1.91	0.17	0.69	0.04
F32 Litho EGEN 3	F22-EC2-LCSGEN-3	34.85	4.02	0.37	0.67	0.04
F32 Litho EGEN 4	F22-EC2-LCSGEN-4	34.85	4.02	0.37	0.67	0.04
F32 EGEN 1	F32-13-EGEN-1	45.09	5.80	0.64	1.29	3.74
F32 EGEN 2	F32-13-EGEN-2	45.09	5.80	0.64	1.29	3.74
F32 EGEN 3	F32-13-EGEN-3	45.09	5.80	0.64	1.29	3.74
F32 EGEN 4	F32-13-EGEN-4	34.11	1.16	0.26	0.71	0.71
F32 OC30 EGEN 1	F22-30-GEN-1	1.51	0.18	0.03	0.02	0.08
F12 Fire Pump 1	F12-FPHS-GEN-01	8.53	1.84	0.61	0.68	0.56
F12 Fire Pump 2	F12-FPHS-GEN-02	8.53	1.84	0.61	0.68	0.56
F42 EGEN 1A	F42-17-EGEN-1A	46.41	1.54	0.73	1.05	0.81
F42 EGEN 1B	F42-17-EGEN-1B	46.41	1.54	0.73	1.05	0.81
F42 EGEN 2A	F42-17-EGEN-2A	46.41	1.54	0.73	1.05	0.81
F42 EGEN 2B	F42-17-EGEN-2B	46.41	1.54	0.73	1.05	0.81
F42 EGEN 3A	F42-GEN-3A	46.41	1.54	0.73	1.05	0.81
F42 EGEN 3B	F42-GEN-3B	46.41	1.54	0.73	1.05	0.81
F42 EGEN 1C	F42-GEN-1C	46.41	1.54	0.73	1.05	0.81
F42 EGEN 2C	F42-GEN-2C	46.41	1.54	0.73	1.05	0.81
F42 EGEN 3C	F42-GEN-3C	46.41	1.54	0.73	1.05	0.81
F42 EGEN 4A	F42-17-GEN-4A	46.41	1.54	0.73	1.05	0.81
F42 EGEN 4B	F42-17-GEN-4B	46.41	1.54	0.73	1.05	0.81
F42 EGEN 4C	F42-17-GEN-4C	46.41	1.54	0.73	1.05	0.81
F42 BRW EGEN	F42-BRW-GEN1	4.02	0.64	0.06	0.05	1.12
F42 IWW EGEN 1	OW1-XWTG1X23A	49.66	1.99	0.43	0.66	0.05
F12 CAP Water EGEN	F12-CAP-X72AGENOCCA	12.08	0.56	0.13	0.48	0.27

Notes:

1 - PM emissions ≤ 2.5µm in size; therefore, emission factors represent total PM, PM_{10}, and $PM_{2.5}$.

Section A. Emergency Engines and Fire Pumps: NOx, CO, PM, PM_{10}, $PM_{2.5}$, VOC, and SO_2 Emissions

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

Unit	Permit ID	Run Time (hrs)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F12 EGEN 1	F12-03-EGEN-1	0.6	1.0	0.0	1.7	0.0	0.0
F12 EGEN 2	F12-03-EGEN-2	0.0	1.0	0.0	1.6	0.0	0.2
F12 EGEN 3	F12-03-EGEN-3	0.0	1.0	0.0	1.6	0.0	0.0
F12 EGEN 4	F12-03-EGEN-4	0.0	1.0	0.0	1.4	0.0	0.0
F12 EGEN 5	F12-03-EGEN-5	0.0	1.0	0.0	1.0	0.0	0.0
F12/32S Link EGEN 1	F12-ASH1-EGEN604-1A-01	0.0	1.0	0.0	1.0	0.0	1.0
F12 Litho Chiller Pad EGEN 2	F12-03-LSCGEN-1	0.4	0.0	0.0	0.2	0.0	0.2
F12 Litho Chiller Pad EGEN 3	F12-03-LSCGEN-2	0.4	0.0	0.0	0.3	0.0	0.1
F12 Litho Chiller Pad EGEN 4	F12-03-LSCGEN-3	0.4	0.0	0.0	0.2	0.0	0.2
F32S CPS EGEN 1	F22-10-CPS-GEN-1	0.5	1.0	0.5	2.6	0.6	0.8
F32S CPS EGEN 2	F22-10-CPS-GEN-2	0.2	0.4	0.7	0.7	0.5	0.6
F32S CPS EGEN 3	F22-10-CPS-GEN-3	0.4	0.2	1.3	0.7	0.6	0.0
F32S CPS EGEN 4	F22-10-CPS-GEN-4	0.2	0.6	0.3	0.8	0.6	0.2
F32S EGEN 1	F22-10-EGEN-1	0.6	0.5	0.6	0.5	0.5	0.6
F32S EGEN 2	F22-10-EGEN-2	0.0	0.0	1.0	0.0	1.0	0.0
F32S EGEN 3	F22-10-EGEN-3	1.0	0.0	1.0	0.0	1.0	0.0
F32S EGEN 4	F22-10-EGEN-4	0.6	0.6	0.5	0.5	0.5	0.5
F32 Litho EGEN 1	F32-09-LCSGEN-1	0.0	0.3	0.5	0.5	0.5	0.6
F32 Litho EGEN 2	F32-09-LCSGEN-2	0.0	0.7	0.5	0.5	0.4	0.6
F32 Litho EGEN 3	F22-EC2-LCSGEN-3	0.0	0.3	0.4	0.5	0.3	0.5
F32 Litho EGEN 4	F22-EC2-LCSGEN-4	0.0	0.1	0.6	0.4	0.7	0.2
F32 EGEN 1	F32-13-EGEN-1	1.0	0.0	0.0	1.0	0.0	1.0
F32 EGEN 2	F32-13-EGEN-2	1.0	0.0	1.0	0.0	1.0	0.0
F32 EGEN 3	F32-13-EGEN-3	0.0	0.0	1.0	0.0	0.0	1.0
F32 EGEN 4	F32-13-EGEN-4	1.0	0.0	1.0	1.0	0.0	0.0
F32 OC30 EGEN 1	F22-30-GEN-1	0.6	0.4	0.0	0.5	0.0	0.4
F12 Fire Pump 1	F12-FPHS-GEN-01	2.1	9.6	1.8	0.5	15.1	1.9
F12 Fire Pump 2	F12-FPHS-GEN-02	2.7	5.9	6.1	3.7	7.8	3.4
F42 EGEN 1A	F42-17-EGEN-1A	0.0	0.8	0.5	0.4	0.6	0.5
F42 EGEN 1B	F42-17-EGEN-1B	0.6	0.8	0.5	0.4	0.6	0.5
F42 EGEN 2A	F42-17-EGEN-2A	0.5	1.2	0.6	0.5	0.4	0.5
F42 EGEN 2B	F42-17-EGEN-2B	0.3	0.3	0.2	0.2	0.3	0.9
F42 EGEN 3A	F42-GEN-3A	0.0	1.2	0.5	0.4	0.5	0.6
F42 EGEN 3B	F42-GEN-3B	0.0	0.6	0.6	0.5	0.4	0.5
F42 EGEN 1C	F42-GEN-1C	0.0	0.3	0.1	0.0	0.0	0.7
F42 EGEN 2C	F42-GEN-2C	0.0	0.3	0.1	0.0	0.4	0.8
F42 EGEN 3C	F42-GEN-3C	0.0	0.5	0.6	0.5	0.3	0.5
F42 EGEN 4A	F42-17-GEN-4A	0.0	1.1	0.5	0.4	0.5	0.0
F42 EGEN 4B	F42-17-GEN-4B	0.0	1.1	0.6	0.5	0.4	0.5
F42 EGEN 4C	F42-17-GEN-4C	0.0	0.5	0.7	0.5	0.3	0.5
F42 BRW EGEN	F42-BRW-GEN1	0.8	0.4	0.5	0.4	0.3	0.0
F42 IWW EGEN 1	OW1-XWTG1X23A	0.0	0.0	0.0	0.0	0.5	0.0
F12 CAP Water EGEN	F12-CAP-X72AGENOCCA	0.5	0.5	0.7	0.5	0.5	0.0

Section B. Boilers & Trimix: PM, PM10, PM2.5, SO2, and VOC Emissions

Table 3-3. PM, PM_{10}, $PM_{2.5}$, SO2, and VOC Emission Factors for Boilers & Trimix

Unit	Permit ID	$PM/PM_{10}/PM_{2.5}$ [1]	VOC	SO_2	NOx [2]	CO [2]
		(lb/mmscf)	(lb/mmscf)	(lb/mmscf)	(lb/mmBTU)	(lb/mmBTU)
F12 Boiler 1	BLR-32-GD3-1	7.60	5.50	0.60		
F12 Boiler 2	BLR-32-GD3-2	7.60	5.50	0.60		
F12 Boiler 3	BLR-32-GD3-3	7.60	5.50	0.60		
F12 Boiler 4	BLR-32-GD3-4	7.60	5.50	0.60		
F32S Boiler 1	BLR-115-1-210	7.60	5.50	0.60		
F32S Boiler 2	BLR-115-2-210	7.60	5.50	0.60		
F32S Boiler 3	BLR-115-3-210	7.60	5.50	0.60		
F32S Boiler 4	BLR-115-4-210	7.60	5.50	0.60		
F32S Boiler 5	BLR-115-5-210	7.60	5.50	0.60		
F32 Boiler 2	BLR-115-31-210	7.60	5.50	0.60		
F42 Boiler 1	BLR-115-1-10	7.60	5.50	0.60		
F42 Boiler 2	BLR-115-2-10	7.60	5.50	0.60		
F42 Boiler 3	BLR-115-3-10	7.60	5.50	0.60		
F42 Boiler 4	BLR-115-4-10	7.60	5.50	0.60		
F52/F62 Boiler 1	TBD	7.60	5.50	0.60	0.0105	0.0360
F52/F62 Boiler 2	TBD	7.60	5.50	0.60	0.0105	0.0360
F52/F62 Boiler 3	TBD	7.60	5.50	0.60	0.0105	0.0360
F32S/32 Trimix A	PWB2-OX293-0-70	7.60	5.50	0.60		
F32S/32 Trimix B	PWB2B-OX293-0-70	7.60	5.50	0.60		
F42 Trimix 1	F42-PB1A-OX293-0-70	7.60	5.50	0.60		

Notes:

1 - PM emissions ≤ 2.5µm in size; therefore, emission factors represent total PM, PM_{10}, and $PM_{2.5}$.

2 - Until initial performance testing is completed for the F52/F62 boilers 1, 2, and 3 and results are submitted to MCAQD, NOx and CO emissions are calculated based on permit emission limits and natural gas use.

Section B. Boilers & Trimix: PM, PM_{10}, $PM_{2.5}$, SO_2, and VOC Emissions

Table 3-4. Natural Gas Usage for Boilers & Trimix

Unit [1, 2]	Permit ID	Natural Gas Usage (mmscf)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F12 Boiler 1	BLR-32-GD3-1	0.11	4.90	10.83	20.13	23.97	12.77
F12 Boiler 2	BLR-32-GD3-2	1.05	6.39	5.16	0.02	0.05	30.23
F12 Boiler 3	BLR-32-GD3-3	18.10	11.99	8.80	8.25	11.44	3.84
F12 Boiler 4	BLR-32-GD3-4	3.88	0.03	0.00	0.00	0.00	0.07
F32S Boiler 1	BLR-115-1-210	3.53	3.49	4.61	7.09	9.07	9.24
F32S Boiler 2	BLR-115-2-210	0.00	0.00	0.00	0.00	0.00	0.01
F32S Boiler 3	BLR-115-3-210	6.23	6.44	6.91	8.38	8.32	10.87
F32S Boiler 4	BLR-115-4-210	0.16	0.12	0.18	0.62	4.99	8.93
F32S Boiler 5	BLR-115-5-210	0.01	0.01	0.01	0.01	0.01	1.13
F32 Boiler 2	BLR-115-31-210						
F42 Boiler 1	BLR-115-1-10	0.01	0.01	0.01	0.01	0.02	0.32
F42 Boiler 2	BLR-115-2-10	0.01	0.03	2.43	3.88	4.00	4.14
F42 Boiler 3	BLR-115-3-10	0.01	0.01	0.01	0.01	0.01	0.01
F42 Boiler 4	BLR-115-4-10	1.52	1.54	0.52	0.00	0.00	0.00
F52/F62 Boiler 1	TBD						0.005
F52/F62 Boiler 2	TBD						0.29
F52/F62 Boiler 3	TBD						0.32
F32S/32 Trimix A	PWB2-OX293-0-70	0.09	0.29	0.43	0.48	0.22	0.27
F32S/32 Trimix B	PWB2B-OX293-0-70	0.53	0.23	0.02	0.00	0.35	0.32
F42 Trimix 1	F42-PB1A-OX293-0-70	0.33	0.34	0.39	0.36	0.32	0.48

Notes:

1 - On January 31, 2019, Intel notified MCAQD that F32 Boiler 2 had been removed from service. The natural gas line feeding this unit is disconnected and capped.
2 - F52/62 boilers 1, 2, and 3 were being commissioned during H2 2023; emissions are associated with start up activities.

Section C. Boilers & Trimix: NOx and CO Emissions

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

Unit [1, 2]	Permit ID	NO_X (lb/hr)	CO (lb/hr)
F12 Boiler 1	BLR-32-GD3-1	0.41	0.00
F12 Boiler 2	BLR-32-GD3-2	0.58	0.00
F12 Boiler 3	BLR-32-GD3-3	0.18	0.04
F12 Boiler 4	BLR-32-GD3-4	0.38	0.03
F32S Boiler 1	BLR-115-1-210	0.14	0.01
F32S Boiler 2	BLR-115-2-210	0.20	0.01
F32S Boiler 3	BLR-115-3-210	0.10	0.01
F32S Boiler 4	BLR-115-4-210	0.11	0.01
F32S Boiler 5	BLR-115-5-210	0.31	2.15E-06
F32 Boiler 2	BLR-115-31-210	0.10	0.04
F42 Boiler 1	BLR-115-1-10	0.05	0.00
F42 Boiler 2	BLR-115-2-10	0.23	0.00
F42 Boiler 3	BLR-115-3-10	0.23	0.00
F42 Boiler 4	BLR-115-4-10	0.23	0.00
F52/F62 Boiler 1	TBD		
F52/F62 Boiler 2	TBD		
F52/F62 Boiler 3	TBD		
F32S/32 Trimix A	PWB2-OX293-0-70	0.14	0.27
F32S/32 Trimix B	PWB2B-OX293-0-70	0.13	0.005
F42 Trimix 1	F42-PB1A-OX293-0-70	0.096	0.014

Notes:

1 - 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.

2 - Lb/hr NOx and CO emission factors do not yet exist for F52/F62 boilers 1, 2, and 3. These emission factors will be generated from initial performance testing in accordance with Permit condition 41, and used for subsequent emissions calculations. Until then, NOx and CO emissions are calculated using permit emission limits. Refer to table 3-3.

Section C. Boilers & Trimix: NOx and CO Emissions

Table 3-6. Operating Hours for Boilers & Trimix

Unit [1, 2]	Permit ID	Run Time (hrs)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F12 Boiler 1	BLR-32-GD3-1	0	0	306	744	720	698
F12 Boiler 2	BLR-32-GD3-2	26	1	0	0	0	668
F12 Boiler 3	BLR-32-GD3-3	510	744	603	744	720	217
F12 Boiler 4	BLR-32-GD3-4	403	3	0	0	0	0
F32S Boiler 1	BLR-115-1-210	744	744	719	744	720	744
F32S Boiler 2	BLR-115-2-210	0	0	0	0	0	3
F32S Boiler 3	BLR-115-3-210	735	744	720	744	720	744
F32S Boiler 4	BLR-115-4-210	5	0	12	152	720	679
F32S Boiler 5	BLR-115-5-210	0	0	0	0	0	61
F32 Boiler 2	BLR-115-31-210						
F42 Boiler 1	BLR-115-1-10	1	2	2	1	3	61
F42 Boiler 2	BLR-115-2-10	0	2	476	744	719	693
F42 Boiler 3	BLR-115-3-10	0	0	0	0	0	0
F42 Boiler 4	BLR-115-4-10	744	742	241	0	0	0
F32S/32 Trimix A	PWB2-OX293-0-70	744	744	720	744	720	744
F32S/32 Trimix B	PWB2B-OX293-0-70	744	744	720	744	720	744
F42 Trimix 1	F42-PB1A-OX293-0-70	744	744	720	744	720	744

Notes:

1 - On January 31, 2019, Intel notified MCAQD that F32 Boiler 2 had been removed from service. The natural gas line feeding this unit is disconnected and capped.

2 - Operating hours for F52/F62 boilers were not used for purposes of calculating emissions associated with commissioning activities for this reporting period and are therefore not listed here, but will be added in future reports once performance testing has occurred, and operating hours are necessary.

Section D. General Fab Natural Gas Combustion Emissions: NOx, CO, PM, PM_{10}, $PM_{2.5}$, SO_2, and VOC Emissions

Table 3-7. NOx, CO, PM, PM_{10}, $PM_{2.5}$, VOC, and SO_2 Emission Factors for General Fab Natural Gas Combustion Units

Unit	NO_X (lb/mmscf)	CO (lb/mmscf)	$PM/PM_{10}/PM_{2.5}$ [1] (lb/mmscf)	VOC (lb/mmscf)	SO_2 (lb/mmscf)
General Fab Natural Gas Combustion	100	84	7.6	5.5	0.6

Notes:

1 - PM emissions ≤ 2.5µm in size; therefore, emission factors represent total PM, PM_{10}, and $PM_{2.5}$.

Section D. General Fab Natural Gas Combustion Emissions: NOx, CO, PM, PM_{10}, $PM_{2.5}$, SO_2, and VOC Emissions

Table 3-8. General Fab Natural Gas Usage

Unit	Natural Gas Usage (mmscf)					
	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
General Fab Natural Gas Combustion	15.80	16.85	15.88	17.81	20.27	21.12

Section E. Cooling Towers: PM, PM_{10}, $PM_{2.5}$ Emissions

Table 3-9. Cooling Tower Conductivity & Total Dissolved Solids (TDS) Concentrations

Unit [1, 2]	Permit ID	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Conductivity (µS)							
MSB Cooling Tower Water	NA	3334	3281	3264	3197	3276	3283
F12 Cooling Tower Water	F12-CT-29-GG5-(001 to 010)	4028	3889	3898	3958	4162	3864
F32S Cooling Tower Water	F22-OCC2-CT-114-(1 to 7)-210	4043	3808	3769	3687	3984	3970
F32 Cooling Tower Water	F32-CT-114-(31 to 36)-210	3715	3767	3805	3841	4027	3991
F32 OC30 Packaged Cooling Tower Water	TBD	3973	3763	3630	3219	3631	3635
F42 Cooling Tower Water	F42-BC1A-CT114-(1 to 14)-10	3923	3925	3800	3456	3647	3792
F52 Cooling Tower Water	TBD						1157
TDS (ppm)							
MSB Cooling Tower Water	NA	2,234	2,198	2,187	2,142	2,195	2,200
F12 Cooling Tower Water	F12-CT-29-GG5-(001 to 010)	2,699	2,606	2,611	2,652	2,788	2,589
F32S Cooling Tower Water	F22-OCC2-CT-114-(1 to 7)-210	2,709	2,551	2,525	2,470	2,669	2,660
F32 Cooling Tower Water	F32-CT-114-(31 to 36)-210	2,489	2,524	2,549	2,573	2,698	2,674
F32 OC30 Packaged Cooling Tower Water	TBD	2,662	2,521	2,432	2,157	2,432	2,435
F42 Cooling Tower Water	F42-BC1A-CT114-(1 to 14)-10	2,628	2,630	2,546	2,316	2,443	2,541
F52 Cooling Tower Water	TBD						775

Notes:

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

2 - A fraction of the F52/62 cooling towers were in the process of commissioning during H2 2023; emissions are associated with start up activities.

Table 3-10. Cooling Tower Flow Rates

Unit [1,2]	Permit ID	Flow Rate (gpm)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
MSB	NA	2820	2820	2820	2820	2820	2820
FAB 12 CTs	F12-CT-29-GG5-(001 to 010)	58473	70145	59937	57601	51080	51044
FAB 32S CTs	F22-OCC2-CT-114-(1 to 7)-210	46080	46080	44291	37716	30720	30720
FAB 32 CTs	F32-CT-114-(31 to 36)-210	31650	36084	31526	31572	33201	33750
FAB 32 OC30 Packaged CTs	TBD	11952	11952	11952	9119	7980	11251
FAB 42 CTs	F42-BC1A-CT114-(1 to 14)-10	83890	86392	80000	73776	65200	60768
FAB 52 CTs	TBD						7275

Notes:

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

2 - A fraction of the F52/62 cooling towers were in the process of commissioning during H2 2023; emissions are associated with start up activities.

Section F. Cooling Towers: VOC Emissions

Table 3-11. VOC Chemical Usage in Cooling Towers

Unit	Permit ID	Cooling Tower Chemical Usage (lb)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Sitewide	Multiple	57.7	29.2	56.0	83.4	2.5	84.8

Section G. Storage Silos: PM, PM_{10}, and $PM_{2.5}$ Emissions

Table 3-12. PM, PM_{10}, and $PM_{2.5}$ Emission Factors for Silos

Unit	Permit ID	PM/PM10/PM2.5[1] (lb PM/ton of material)
F12 HFW Lime Silo	F12-TK266-1-40	0.0049
F32S HFW Lime Silo	OC9-TK266-1-40	0.0049
F32 HFW Lime Silo	PWB2-TK266-1-40	0.0049
F42 HFW Lime Silo	F42-PB1A-TK266-1-40	0.0049
F42 HFW Lime Silo	F42-PB1B-TK266-1-40	0.0049
F52 HFW Lime Silo	F42-PB1C-TK266-1-40	0.0049

Notes:

1 - PM emissions ≤ 2.5µm in size; therefore, emission factors represent total PM, PM_{10}, and $PM_{2.5}$.

Section G. Storage Silos: PM, PM_{10}, and $PM_{2.5}$ Emissions

Table 3-13. Storage Silo Loading Frequency

Unit	Permit ID	Number of Silo Loads					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F12 HFW Lime Silo	F12-TK266-1-40	1	2	0	1	1	0
F32S HFW Lime Silo	OC9-TK266-1-40	2	1	2	1	2	3
F32 HFW Lime Silo	PWB2-TK266-1-40	1	2	1	1	3	1
F42 HFW Lime Silo	F42-PB1A-TK266-1-40	3	3	2	3	2	2
F42 HFW Lime Silo	F42-PB1B-TK266-1-40	1	5	3	2	2	2
F52 HFW Lime Silo	F42-PB1C-TK266-1-40	0	0	1	1	0	0

Section H. Monitoring System for Permitted VOC Abatement Control Devices (Natural Gas Combustions Emissions Only): SO_2 Emissions

Table 3-14. SO_2 Emission Factors for VOC Abatement Control Devices

Unit	Permit ID	SO_2 (lb/mmscf)
F12 RCTO 1	VOC-16-FK2-01	0.6
F12 RCTO 2	VOC-16-FK2-02	0.6
F12 RCTO 3	VOC-16-FM2-01	0.6
F12 RCTO 4	VOC-16-FM2-02	0.6
F12 LCE RCTO 1	OCF1C-VOC-138-1-20	0.6
F12 LCE RCTO 2	OCF1C-VOC-138-2-20	0.6
F12 LCE RCTO 3	OCF1C-VOC-138-3-00	0.6
F12 LCE RCTO 4	OCF1C-VOC-138-4-00	0.6
F32S RCTO 3	VOC-138-3-120	0.6
F32S RCTO 4	VOC-138-4-120	0.6
F32S RCTO 5	VOC-138-5-120	0.6
F32S RCTO 6	VOC-138-6-120	0.6
F32 RCTO 1	VOC-138-01-120	0.6
F32 RCTO 2	VOC-138-02-120	0.6
F32 RCTO 3	VOC-138-03-120	0.6
F32 RCTO 4	OCF3B-VOC138-1-20	0.6
F32 RCTO 5	OCF3B-VOC138-2-20	0.6
F32 RCTO 6	OCF3B-VOC138-3-20	0.6
F42 RCTO 1	FB1A-VOC138-1-00	0.6
F42 RCTO 2	FB1A-VOC138-2-00	0.6
F42 RCTO 3	FB1A-VOC138-3-00	0.6
F42 RCTO 4	OCFB1A-VOC-138-4-00	0.6
F42 RCTO 5	OCFB1A-VOC-138-5-00	0.6

Section H. Monitoring System for Permitted VOC Abatement Control Devices (Natural Gas Combustions Emissions Only): SO_2 Emissions

Table 3-15. Natural Gas Usage for VOC Abatement Control Devices

Unit	Permit ID	Natural Gas Usage (mmscf)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F12 RCTO 1	VOC-16-FK2-01	1.32	1.34	1.77	1.68	1.39	1.01
F12 RCTO 2	VOC-16-FK2-02	0.82	0.83	0.82	0.86	0.82	1.21
F12 RCTO 3	VOC-16-FM2-01	0.90	0.93	0.96	1.07	1.01	0.99
F12 RCTO 4	VOC-16-FM2-02	1.06	1.09	1.10	1.21	0.59	0.51
F12 LCE RCTO 1	OCF1C-VOC-138-1-20	1.57	1.56	1.02	0.00	0.51	1.67
F12 LCE RCTO 2	OCF1C-VOC-138-2-20	0.00	0.00	0.00	0.00	0.00	0.00
F12 LCE RCTO 3	OCF1C-VOC-138-3-00	1.34	1.13	1.14	1.28	1.36	1.40
F12 LCE RCTO 4	OCF1C-VOC-138-4-00	1.90	1.89	1.92	1.97	1.93	1.95
F32S RCTO 3	VOC-138-3-120	0.71	0.72	0.72	0.75	0.78	0.89
F32S RCTO 4	VOC-138-4-120	0.82	0.83	0.81	0.84	0.81	0.88
F32S RCTO 5	VOC-138-5-120	0.58	0.67	0.66	0.69	0.66	0.70
F32S RCTO 6	VOC-138-6-120	1.03	1.08	1.04	1.16	1.29	1.39
F32 RCTO 1	VOC-138-01-120	0.94	0.96	0.95	0.97	0.91	0.88
F32 RCTO 2	VOC-138-02-120	0.85	0.87	0.85	0.88	0.87	0.91
F32 RCTO 3	VOC-138-03-120	0.49	0.49	0.50	0.51	0.52	0.53
F32 RCTO 4	OCF3B-VOC138-1-20	0.50	0.57	0.56	0.58	0.56	0.58
F32 RCTO 5	OCF3B-VOC138-2-20	0.69	0.69	0.67	0.50	0.65	0.68
F32 RCTO 6	OCF3B-VOC138-3-20	1.27	1.26	1.22	1.26	1.21	1.18
F42 RCTO 1	FB1A-VOC138-1-00	1.39	1.20	0.03	0.00	0.00	0.00
F42 RCTO 2	FB1A-VOC138-2-00	2.00	1.72	1.67	2.20	1.69	2.12
F42 RCTO 3	FB1A-VOC138-3-00	1.38	0.23	1.22	1.82	1.72	1.50
F42 RCTO 4	OCFB1A-VOC-138-4-00	1.80	0.93	0.91	1.20	1.02	1.03
F42 RCTO 5	OCFB1A-VOC-138-5-00	2.02	1.92	1.70	1.67	1.68	1.78

Section I. Monitoring System for Fab Emission Units (Process and Natural Gas Combustion Emissions Exhausted Through Ammonia Scrubbers): NOx Emissions

Table 3-16. Site-Wide EXAM NOx Performance Testing Results and Monthly Production Index (PI) [1,2,3]

Stack Type	NOx Testing Result (lb/hr)	Monthly Production Indexes					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Ammonia Scrubbers	2.08	1.14	1.23	1.04	1.21	1.14	1.22

Notes:

1 - 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.

2 - The emission factor is based on performance testing conducted in 2023.

3 - The fabs operated constantly over the reporting period.

Section J. Monitoring System for Fab Emission Units (Process and Natural Gas Combustion Emissions Exhausted Through VOC Abatement Units, Wet Acid Scrubbers and Ammonia Scrubbers): VOC Emissions

Table 3-17. Site-Wide VOC Performance Testing Results and Monthly Production Index (PI) [1,2,3]

Stack Type	VOC Testing Result (lb/hr)	Monthly Production Indexes					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
RCTO VOC Abatement Units	0.616	1.12	1.22	1.03	1.19	1.13	1.21
Wet Acid Scrubbers	2.770	1.80	1.95	1.64	1.91	1.81	1.93
Ammonia Scrubbers	5.922	1.14	1.23	1.04	1.21	1.14	1.22

Notes:

1 - 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.

2 - Emission factors are based on performance testing conducted in 2023.

3 - The fabs operated constantly over the reporting period.

Section K. Monitoring Systems for Fab Emission Units (Process Emissions Only Exhausted Through Wet Acid Scrubbers and Process and Natural Gas Combustion Emissions Exhausted Through VOC Abatement Units): CO, NOx, PM, PM_{10}, and $PM_{2.5}$ Emissions

Table 3-18. Site-Wide CO, NOx, PM, PM_{10}, and $PM_{2.5}$ Stack Testing

Stack Type [1,2,3,4]	Testing Result (lb/hr)	Monthly Production Indexes					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Wet Acid Scrubbers - CO	26.34	1.80	1.95	1.64	1.91	1.81	1.93
Wet Acid Scrubbers - NOx	13.17	1.80	1.95	1.64	1.91	1.81	1.93
Wet Acid Scrubbers - PM, PM_{10}, $PM_{2.5}$	2.55	1.80	1.95	1.64	1.91	1.81	1.93
VOC Abatement Units - CO	4.37	1.12	1.22	1.03	1.19	1.13	1.21
VOC Abatement Units - NOx	3.91	1.12	1.22	1.03	1.19	1.13	1.21
VOC Abatement Units - PM, PM_{10}, $PM_{2.5}$	0.72	1.12	1.22	1.03	1.19	1.13	1.21

Notes:

1 - 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.

2 - PM emissions ≤ 2.5µm in size; therefore, emission factors represent total PM, PM_{10}, and $PM_{2.5}$.

3 - Emission factors are based on performance testing conducted in 2023.

4 - The fabs operated constantly over the reporting period.

Section L. Monitoring System for Fab Emissions Units (Process Emissions Only): SO_2 and Fluoride Emissions (Fluoride emissions do not include HF)

Table 3-19. Weighting Factors for SO_2 Process Emissions

Compound		Weighting Factor (%)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Chem 1	Tech A	0.8%	0.7%	2.9%	3.5%	3.6%	3.4%
Chem 2		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 1	Tech C	99.2%	99.3%	97.1%	96.5%	96.4%	96.6%
Chem 2		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 3-20. SO_2 Process Chemical Usage

Compound	Chemical Usage (lb)					
	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Chem 1	3455	3535	3075	3130	3285	3265
Chem 2	251	754	419	503	419	838

Section L. Monitoring System for Fab Emissions Units (Process Emissions Only): SO_2 and Fluoride Emissions (Fluoride emissions do not include HF)

Table 3-21. Emission Factors for SO_2 Process Emissions

Compound	Tech A	Tech C
	(lb/lb)	(lb/lb)
Chem 1	0	0.03
Chem 2	0	0.11

Table 3-22. Weighting Factors for Fluoride Process Emissions (excludes HF)

Compound		Weighting Factor (%)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Chem 1	Tech A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 2		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 3		0.5%	0.4%	1.8%	2.2%	2.2%	2.1%
Chem 4		0.5%	0.4%	1.8%	2.2%	2.2%	2.1%
Chem 5		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 6		0.8%	0.7%	2.9%	3.5%	3.6%	3.4%
Chem 7		0.8%	0.7%	2.9%	3.5%	3.6%	3.4%
Chem 8		0.8%	0.7%	2.9%	3.5%	3.6%	3.4%
Chem 9		0.8%	0.7%	2.9%	3.5%	3.6%	3.4%
Chem 10		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 11		0.5%	0.5%	2.0%	2.4%	2.4%	2.3%
Chem 12		0.5%	0.5%	2.0%	2.4%	2.4%	2.3%
Chem 13		0.5%	0.5%	2.0%	2.4%	2.4%	2.3%
Chem 14		0.8%	0.7%	3.1%	3.6%	3.7%	3.6%
Chem 15		0.8%	0.7%	3.1%	3.6%	3.7%	3.6%
Chem 16		1.5%	1.2%	5.2%	6.2%	6.3%	6.1%
Chem 17		1.5%	1.2%	5.2%	6.2%	6.3%	6.1%
Chem 18		0.7%	0.6%	2.5%	3.0%	3.1%	3.0%
Chem 19		0.7%	0.6%	2.5%	3.0%	3.1%	3.0%
Chem 20		0.7%	0.6%	2.5%	3.0%	3.1%	3.0%
Chem 21		0.4%	0.3%	1.4%	1.6%	1.7%	1.6%
Chem 22		0.4%	0.3%	1.4%	1.6%	1.7%	1.6%
Chem 23		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 24		3.0%	2.5%	10.4%	12.2%	12.5%	12.1%
Chem 25		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 26		3.0%	2.5%	10.4%	12.2%	12.5%	12.1%
Chem 27		0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Chem 28		0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Chem 29		1.0%	0.9%	3.7%	4.4%	4.5%	4.4%
Chem 30		1.0%	0.9%	3.7%	4.4%	4.5%	4.4%
Chem 31		1.0%	0.9%	3.7%	4.4%	4.5%	4.4%
Chem 32		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 33		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 34		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 35		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 36		3.8%	3.2%	12.9%	15.0%	15.3%	14.8%

Table 3-22. Weighting Factors for Fluoride Process Emissions (excludes HF) (continued)

Compound		Chemical Usage (lb)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Chem 1	Tech C	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 2		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 3		99.5%	99.6%	98.2%	97.8%	97.8%	97.9%
Chem 4		99.5%	99.6%	98.2%	97.8%	97.8%	97.9%
Chem 5		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chem 6		99.2%	99.3%	97.1%	96.5%	96.4%	96.6%
Chem 7		99.2%	99.3%	97.1%	96.5%	96.4%	96.6%
Chem 8		99.2%	99.3%	97.1%	96.5%	96.4%	96.6%
Chem 9		99.2%	99.3%	97.1%	96.5%	96.4%	96.6%
Chem 10		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 11		99.5%	99.5%	98.0%	97.6%	97.6%	97.7%
Chem 12		99.5%	99.5%	98.0%	97.6%	97.6%	97.7%
Chem 13		99.5%	99.5%	98.0%	97.6%	97.6%	97.7%
Chem 14		99.2%	99.3%	96.9%	96.4%	96.3%	96.4%
Chem 15		99.2%	99.3%	96.9%	96.4%	96.3%	96.4%
Chem 16		98.5%	98.8%	94.8%	93.8%	93.7%	93.9%
Chem 17		98.5%	98.8%	94.8%	93.8%	93.7%	93.9%
Chem 18		99.3%	99.4%	97.5%	97.0%	96.9%	97.0%
Chem 19		99.3%	99.4%	97.5%	97.0%	96.9%	97.0%
Chem 20		99.3%	99.4%	97.5%	97.0%	96.9%	97.0%
Chem 21		99.6%	99.7%	98.6%	98.4%	98.3%	98.4%
Chem 22		99.6%	99.7%	98.6%	98.4%	98.3%	98.4%
Chem 23		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 24		97.0%	97.5%	89.6%	87.8%	87.5%	87.9%
Chem 25		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 26		97.0%	97.5%	89.6%	87.8%	87.5%	87.9%
Chem 27		100.0%	100.0%	100.0%	99.9%	99.9%	99.9%
Chem 28		100.0%	100.0%	100.0%	99.9%	99.9%	99.9%
Chem 29		99.0%	99.1%	96.3%	95.6%	95.5%	95.6%
Chem 30		99.0%	99.1%	96.3%	95.6%	95.5%	95.6%
Chem 31		99.0%	99.1%	96.3%	95.6%	95.5%	95.6%
Chem 32		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 33		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 34		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 35		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Chem 36		96.2%	96.8%	87.1%	85.0%	84.7%	85.2%

Table 3-23. Fluoride Process Chemical Usage

Compound	Chemical Usage (lb)					
	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Chem 1	680	520	400	600	520	440
Chem 2	0	0	0	0	0	0
Chem 3	544	1088	808	942	942	942
Chem 4	544	1088	808	942	942	942
Chem 5	0	0	0	0	0	0
Chem 6	3455	3535	3075	3130	3285	3265
Chem 7	3455	3535	3075	3130	3285	3265
Chem 8	3455	3535	3075	3130	3285	3265
Chem 9	3455	3535	3075	3130	3285	3265
Chem 10	231	395	231	296	362	263
Chem 11	575	550	500	600	350	625
Chem 12	575	550	500	600	350	625
Chem 13	575	550	500	600	350	625
Chem 14	50	450	200	200	200	450
Chem 15	50	450	200	200	200	450
Chem 16	108	36	108	96	120	96
Chem 17	108	36	108	96	120	96
Chem 18	2400	2960	2170	2320	2480	2320
Chem 19	2400	2960	2170	2320	2480	2320
Chem 20	2400	2960	2170	2320	2480	2320
Chem 21	6349	11288	7760	9877	9171	9171
Chem 22	6349	11288	7760	9877	9171	9171
Chem 23	0	1	0	1	1	1
Chem 24	0	44	0	0	0	0
Chem 25	46689	17269	38251	54582	16718	33933
Chem 26	0	44	0	0	0	0
Chem 27	286	371	180	155	122	111
Chem 28	286	371	180	155	122	111
Chem 29	17600	9230	17600	17600	17600	17600
Chem 30	17600	9230	17600	17600	17600	17600
Chem 31	17600	9230	17600	17600	17600	17600
Chem 32	0	0	54	0	0	0
Chem 33	0	0	54	0	0	0
Chem 34	2340	3097	1820	2447	3334	2340
Chem 35	2340	3097	1820	2447	3334	2340
Chem 36	0	4365	0	4365	0	0

Table 3-24. Emission Factors for Fluoride Process Emissions

Compound	Tech A	Tech C
	(lb/lb)	(lb/lb)
Chem 1	-	1.19E-02
Chem 2	6.50E-09	9.49E-05
Chem 3	1.67E-01	7.67E-02
Chem 4	2.06E-02	6.51E-02
Chem 5	1.00E+00	1.00E+00
Chem 6	-	1.70E-03
Chem 7	-	4.32E-04
Chem 8	1.58E-02	9.29E-03
Chem 9	3.72E-01	4.09E-02
Chem 10	-	7.71E-05
Chem 11	-	0.00E+00
Chem 12	6.48E-02	8.22E-02
Chem 13	6.41E-02	1.46E-02
Chem 14	3.86E-05	1.72E-01
Chem 15	2.33E-02	3.01E-02
Chem 16	1.33E-02	7.09E-03
Chem 17	2.63E-01	4.08E-02
Chem 18	-	0.00E+00
Chem 19	5.95E-02	6.25E-02
Chem 20	4.12E-02	1.23E-02
Chem 21	3.41E-02	3.24E-01
Chem 22	5.46E-02	3.00E-02
Chem 23	-	8.41E-01
Chem 24	2.47E-01	2.47E-01
Chem 25	-	0.00E+00
Chem 26	1.62E-02	1.62E-02
Chem 27	-	1.77E+00
Chem 28	1.00E+00	3.94E-03
Chem 29	-	1.92E-04
Chem 30	1.27E-02	2.27E-02
Chem 31	5.45E-03	2.94E-03
Chem 32	-	6.73E-03
Chem 33	7.53E-01	4.20E-02
Chem 34	1.22E-03	2.97E-03
Chem 35	3.00E-05	1.86E-05
Chem 36	-	0.00E+00

Section M. Monitoring System for Fab Emission Units (Uncontrolled Evaporative Processes): VOC Emissions (from tanks)

Table 3-25. Tank Throughput

Unit	System	Tank Throughput (gallons)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F12-OCC1-TK-266-1-83	HF	1,339,200	1,339,200	1,296,000	1,339,200	1,296,000	1,339,200
F12-TK-266-1-00	HF	6,026,400	6,026,400	5,832,000	6,026,400	5,832,000	6,026,400
F12-TK-266-1-01	HF	6,919,200	6,919,200	6,696,000	6,919,200	6,696,000	6,919,200
F12-TK-266-1-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F12-TK-266-1-60	HF	6,026,400	6,026,400	5,832,000	6,026,400	5,832,000	6,026,400
F12-TK-266-1-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F12-TK-266-1-90	HF	6,026,400	6,026,400	5,832,000	6,026,400	5,832,000	6,026,400
F12-TK-266-2-00	HF	6,026,400	6,026,400	5,832,000	6,026,400	5,832,000	6,026,400
F12-TK-266-2-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F12-TK-266-2-60	HF	6,026,400	6,026,400	5,832,000	6,026,400	5,832,000	6,026,400
F12-TK-266-2-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F12-TK-76-GH1-1	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F12-TK-76-GH1-2	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F12-TK-76-GH4-1	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F12-TK-76-GH4-2	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F12-TK-76-GH6-1	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F12-TK-79-GH10-1	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F12-TK-79-GH10-2	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F12-TK-79-GH10-3	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F12-TK-79-GH1-1	SOG	518	-	457	-	218	224
F12-TK-79-GH1-2	SOG	518	-	457	-	218	224
F12-TK-79-GH4-1	SOG	518	-	457	-	218	224
F12-TK-79-GH4-2	SOG	518	-	457	-	218	224
F12-TK-79-GH7-1	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F12-TK-79-GH7-2	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F12-TK-80-GH1-1	HCl	-	-	-	-	-	-
F12-TK-80-GH1-2	HCl	489	-	350	927	-	-
F22-OCB2A-TK-269-1-00	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F22-OCB2A-TK-269-1-30	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F22-OCB2A-TK-270-1-00	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F22-OCB2-TK-293-1-00	TMXW	632,549	670,046	596,160	601,747	666,576	799,949
F22-OCB2-TK-293-2-00	TMXW	632,549	670,046	596,160	601,747	666,576	799,949
F22-OCF2-TK-270-1-30	TMXW	25,493	26,888	23,974	23,977	24,167	24,399
F22-PWB2-TK-293-0-92	TMXW	330,559	347,969	315,144	301,320	340,848	407,340
F22-PWB2-TK-293-1-15	TMXW	318,953	328,774	294,192	291,946	325,728	395,510
F22-PWB2-TK-293-2-15	TMXW	318,953	328,774	294,192	291,946	325,728	395,510
F22-PWB2-TK-293-3-15	TMXW	318,953	328,774	294,192	291,946	325,728	395,510
F22-TK-251-1-200	HCl	367	869	169	738	210	-
F22-TK-296-1-05	BSSW	1,005	-	1,031	-	1,451	-
F22-TK-296-1-15	BSSW	1,005	-	1,031	-	1,451	-
F22-TK-296-2-05	BSSW	2,611	-	2,680	-	3,770	-
F32-OC11-TK-266-1-00	HF	6,696,000	6,696,000	6,480,000	6,696,000	6,480,000	6,696,000
F32-OC11-TK-266-2-00	HF	6,696,000	6,696,000	6,480,000	6,696,000	6,480,000	6,696,000
F32-OC11-TK-266-3-00	HF	6,696,000	6,696,000	6,480,000	6,696,000	6,480,000	6,696,000
F32-OC9-TK-266-1-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F32-OC9-TK-266-1-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F32-OC9-TK-266-1-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400

Table 3-25. Tank Throughput (continued)

Unit	System	Tank Throughput (gallons)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F32-OC9-TK-266-1-90	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F32-OC9-TK-266-2-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F32-OC9-TK-266-2-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F32-OC9-TK-266-2-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F32-OCB2B-TK-269-1-00	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F32-OCB2B-TK-270-1-00	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F32-OCB2B-TK-286-1-50	SOG	518	-	457	-	218	224
F32-PWB2B-TK-293-0-92	TMXW	330,559	347,969	315,144	301,320	340,848	407,340
F32-PWB2-TK-266-1-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F32-PWB2-TK-266-1-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F32-PWB2-TK-266-1-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F32-PWB2-TK-266-1-90	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F32-PWB2-TK-266-2-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F32-PWB2-TK-266-2-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F32-PWB2-TK-266-2-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F32-PWB2-TK-269-1-50	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F32-PWB2-TK-269-2-50	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F32-PWB2-TK-270-1-40	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F32-PWB2-TK-270-2-40	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F42-FB1A-TK-266-1-00	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-FB1A-TK-266-2-00	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-FB1A-TK-269-1-00	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F42-FB1A-TK-269-1-30	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F42-FB1A-TK-269-2-00	GSW	9,926	10,818	9,936	9,953	9,665	10,904
F42-FB1A-TK-270-1-00	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F42-FB1A-TK-270-2-00	CSW	25,493	26,888	23,974	23,977	24,167	24,399
F42-FB1A-TK-86-1-50	SOG	518	-	457	-	218	224
F42-FB1B-TK-266-1-00	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-FB1B-TK-266-2-00	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-FB1C-TK-266-1-00	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-FB1C-TK-266-2-00	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-PB1A-TK-251-1-00	HCl	714	870	1,407	887	581	706
F42-PB1A-TK-266-1-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F42-PB1A-TK-266-1-60	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-PB1A-TK-266-1-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F42-PB1A-TK-266-1-83	HF	1,339,200	1,339,200	1,296,000	1,339,200	1,296,000	1,339,200
F42-PB1A-TK-266-1-90	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F42-PB1A-TK-266-2-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F42-PB1A-TK-266-2-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F42-PB1A-TK-266-2-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F42-PB1A-TK-293-0-92	TMXW	481,219	532,109	435,888	425,419	412,992	587,909
F42-PB1A-TK-293-1-00	TMXW	420,509	464,702	392,688	386,136	379,728	564,250
F42-PB1A-TK-293-1-15	TMXW	420,955	472,738	390,096	381,226	372,384	568,267
F42-PB1A-TK-293-2-00	TMXW	420,509	464,702	392,688	386,136	379,728	564,250
F42-PB1A-TK-293-2-15	TMXW	420,955	472,738	390,096	381,226	372,384	568,267
F42-PB1B-TK-266-1-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F42-PB1B-TK-266-1-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F42-PB1B-TK-266-1-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F42-PB1B-TK-266-1-83	HF	1,339,200	1,339,200	1,296,000	1,339,200	1,296,000	1,339,200
F42-PB1B-TK-266-1-90	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000

Table 3-25. Tank Throughput (continued)

Unit [1]	System	Tank Throughput (gallons)					
		Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
F42-PB1B-TK-266-2-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F42-PB1B-TK-266-2-60	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F42-PB1B-TK-266-2-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F42-PB1C-TK-266-1-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F42-PB1C-TK-266-1-60	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-PB1C-TK-266-1-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F42-PB1C-TK-266-1-90	HF	4,464,000	4,464,000	4,320,000	4,464,000	4,320,000	4,464,000
F42-PB1C-TK-266-2-15	HF	11,160,000	11,160,000	10,800,000	11,160,000	10,800,000	11,160,000
F42-PB1C-TK-266-2-60	HF	5,580,000	5,580,000	5,400,000	5,580,000	5,400,000	5,580,000
F42-PB1C-TK-266-2-75	HF	2,678,400	2,678,400	2,592,000	2,678,400	2,592,000	2,678,400
F42-WTR1-TK-932-1-01	HCl	39,342	47,555	47,555	47,555	47,555	47,555

Notes:

1 - F42-WTR1-TK-932-1-01 experienced a monitoring system shutdown when the flow indicating transmitter began leaking in September 2023 and was replaced by a blank spool piece until a replacement can be installed in January 2024. The most recent and largest monthly throughput in the past 12 months was used for the purposes of emission calculations for September through December.

Section N. Monitoring System for Fab Emission Units (Uncontrolled Evaporative Processes): VOC Emissions (from wipers, sinks, and bottles)

Table 3-26. Solvent Usage for Wipers, Sinks, and Bottles

Evaporative Process Emission Source	Solvent Usage (lb)					
	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Bottles	56.69	105.45	58.77	56.81	81.36	83.99
Sinks	280.31	287.37	265.30	294.10	295.28	317.42
Wipers	902.87	1121.54	2185.42	1816.51	1841.05	1754.78

Section Q. Monitoring System for Fugitive Dust Emissions from Vehicular Traffic: PM, PM_{10}, and $PM_{2.5}$

Table 3-27. Emission Factors for Dust Generated by Vehicular Traffic

Road Type	$PM_{2.5}$ (lb/mile)	PM_{10} (lb/mile)	PM (lb/mile)
Industrial Unpaved Roads	0.046	0.456	1.625
Paved Roads (Parking Lots and Manufacturing Areas)	0.00005	0.00020	0.00099

Section Q. Monitoring System for Fugitive Dust Emissions from Vehicular Traffic: PM, PM_{10}, and $PM_{2.5}$

Table 3-28. Vehicular Traffic

Vehicular Traffic Area	Vehicle Miles Travelled					
	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Industrial Unpaved Roads	2,279	2,279	2,206	2,279	2,206	2,279
Paved Roads in Parking Lot Areas	156,765	156,765	112,028	115,763	112,028	154,884
Paved Roads in Manufacturing Areas	40,449	45,369	42,990	46,798	47,029	46,670